

# How to think about science and technology: An Introduction to Science and Technology Studies

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STS Program

Science and technology shape the way we interact with our environment and imagine our bodies. STS is an interdisciplinary field that considers how science and technology work in society. To understand science, we'll explore questions like: How do scientists establish their credibility? How is scientific knowledge affected by gender? Are there scientific revolutions? Thinking about technology, we'll discuss: Does technology determine the future? How do people actually use technologies? Is "technology" more than just machines? In this freshman seminar, we'll read scholars from history, sociology, anthropology and philosophy as they consider how to understand science. The course provides a solid theoretical foundation for future studies in STS, introducing some of its most influential arguments.

## Assignments

Each week you will write a 2-page paper comparing readings A and B listed on the syllabus. Your goal is to show that you understand the readings by describing an important similarity or difference between the two pieces.

At the end of term, you will write a final paper (~10 pages) that takes a current event or controversy related to science and/or technology, and analyze that event in light of the theoretical articles we've been reading. Start reading newspapers now, if you don't already.

## Supplementary Podcast

The Canadian Broadcasting Corporation has produced a marvelous series of interviews with the authors of some of our texts. I encourage you to listen to these podcasts as a supplement to our discussions. They can be downloaded for free through the iTunes store by searching for "How to Think about Science."

## Texts

- *The Science Studies Reader*, Mario Biagioli, ed. (Routledge, 1999).
- Thomas Kuhn, *The Structure of Scientific Revolutions* (Many editions available; I suggest the University of Chicago Press, 1996. ISBN: 0226458083).
- A course packet with photocopies of various articles and chapters

## Schedule

### Week 1: Introduction

### **Week 2: How Does Science Change?**

- A) Thomas Kuhn, *The Structure of Scientific Revolutions*, Chs. 1, 2, 6, 9, 12, pp. 1-22, 52-65, 92-110, 144-160.
- B) Steven Shapin, *The Scientific Revolution*, Introduction and Ch. 2, pp. 1-14, 65-118.

### **Week 3: Does technology determine history?**

- A) Lynn White, "The Agricultural Revolution of the Early Middle Ages," in *Medieval technology and social change* (Oxford University Press, 1962): 39-78.
- B) Peter Perdue, "Technological Determinism in Agrarian Societies," in *Does Technology Drive History? The Dilemma of Technological Determinism*, edited by Leo Marx and Merritt Roe Smith (MIT Press, 1994): 169-200.

### **Week 4: Are there values built into machines?: or, Does history determine technology?**

- A) Langdon Winner, "Do artifacts have politics?" in *The Whale and the reactor: The Search for limits in an age of High Technology* (University of Chicago Press, 1986): 19-39.
  - B) David Noble, *Forces of Production: a social history of industrial automation* (Oxford, 1986): Introduction and Ch. 2.
- Supplement:* Rudi Volti, "An STS Perspective on Technology and Work," in *Visions of STS: Counterpoints in Science, Technology, and Society Studies*, edited by Stephen Cutcliffe and Carl Mitcham (State University of New York Press, 2001): 67-80.

### **Week 5: Is Science timeless and placeless?**

- A) Roger Hart, "On the Problem of Chinese Science," (*Reader*, 189-201)
- B) Andrew Cunningham and Perry Williams, "De-centering the 'big picture': *The Origins of Modern Science* and the modern origins of science," *British Journal for the History of Science* 26 (1993): 407-32.

### **Week 6: Who Can Know? Part 1: Social Position**

- A) Sharon Traweek, "Pilgrim's Progress: Male Tales told during a life in Physics" (*Reader*, 525-542)
- B) Steven Shapin, "The House of Experiment in Seventeenth-Century England" (*Reader*, 479-504)

*Supplement:* Simon Schaffer Podcast

**Week 7: Is Science Masculine?**

- A) Evelyn Fox Keller, "The Gender/Science System: or, Is sex to gender as nature is to science?" (*Reader*, 234-242)
  
- B) Donna Haraway, "Situated Knowledges: The Science question in Feminism and the Privilege of Partial Perspective" (*Reader*, 172-188)

*Supplement:* Evelyn Fox Keller Podcast

**Week 8: Are Science and Religion Natural Enemies?**

- A) John Brooke and Geoffrey Cantor, *Reconstructing Nature: The Engagement of Science and Religion* (Oxford University Press, 1998): Chs. 1, 2 and 4.
  
- B) Edward Larson, "The Scopes Trial in History and Legend," in *When science & Christianity meet*, edited by David C. Lindberg and Ronald L. Numbers (University of Chicago Press, 2003): 245-264.

**Week 9: Is "Technology" something more than machines?**

- A) Thomas Hughes, "The Evolution of Large Technological Systems" (*Reader*, 202-223)
  
- B) Paul Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," in *Modernity and Technology*, Thomas Misa, Philip Brey, and Andrew Feenberg (MIT Press, 2003): 185-226.

*Supplement:* Paul Edwards, "Standards as Social Technology," *Science* 304 (2004): 827-828.

**Week 10: Why are laboratories powerful?**

- A) Bruno Latour, "Give me a Laboratory and I will Raise the World" (*Reader*, 258-275)
  
- B) Michel Callon, "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Briec Bay" (*Reader*, 67-83).

*Supplement:* Bruno Latour podcast

**Week 11: Who Can Know? Part 2: When laboratories aren't powerful**

- A) Brian Wynne, "Sheepfarming After Chernobyl: A Case of Communicating Scientific Information," *Environment* 31(2): 11-15, 33-39.

- B) Steven Epstein, "The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials" *Science, Technology & Human Values*, Vol. 20, No. 4, 408-437 (1995)

*Supplement:* Brian Wynne Podcast

**Week 12: How do people use technology?**

- A) Ronald R. Kline, *Consumers in the Country: Technology and Social Change in Rural America* (Hopkins U. Press, 2000). Chapter 1: "(Re)inventing the Telephone," and Chapter 2: "Taming the Devil Wagon"
- B) Ruth Schwartz Cowan, "The Consumption Junction: A proposal for Research Strategies in the Sociology of Technology," in *The Social Construction of Technological Systems*, edited by Wiebe Bijker, Thomas Hughes, and Trevor Pinch (MIT Press, 1987): 261-280.

**Week 13: How does technology affect men and women differently?**

- A) Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technologies from the Open Hearth to the Microwave* (New York: Basic, 1983).
- B) Margaret Sandelowski, *Devices and Desires: Gender, Technology, and American Nursing*, Ch. 2, "Object Lessons," and Ch. 4, "The Physicians's Eyes"

**Week 14: Final Paper due**