Main Themes in the History of Technology  
(Better title: Historical Approaches for Understanding Technology)  
STS 5206 (CRN 17646), HIST 5206 (CRN 14706)

Spring semester 2017  
Meets 9:00-11:45 AM, Thursdays  Richard F. Hirsh, Major Williams 423  
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Classroom: Surge 101A  
Office Hours: Tuesdays and Wednesdays, 11:30 AM-1:00 PM, and by appointment. (My schedule is not yet fixed, but I can usually meet with students at several other times. Just write me a note and we’ll arrange a convenient time to meet.)

Readings and other materials on Canvas and from Project Muse (Technology & Culture articles from 1998 to present).

This graduate-level introduction to the history of technology focuses on the predominant themes that scholars have pursued during the past 50 years. For example, students will read several books and articles that employ a “contextualist” approach to history of technology—an approach that examines hardware and artifacts within a context of public policy, economics, and society in general. Students will also evaluate criticisms of the historiographical approaches employed in the discipline and look at studies that have sought to remedy thematic and methodological imbalances.

To highlight the principles, theories, and methodologies of research in the history of technology, the course will draw on the reading of lively examples of scholarly works. Because of the professor's research interests, the class will examine subjects in the history of American technology. Topics include the history of mass production, the nature of innovation, the relationship between business institutions and technology, electrification, public policy, and the technological “revolution” in the home. In general, this class will help students acquire a disciplinary fluency that will enable them to analyze academic scholarship in the history of technology and related fields.

On a highly practical level, this course seeks to help students become better analytical thinkers, writers, and communicators. The course involves extensive reading and writing as well as public speaking. Skills honed in the course will serve students well in academic and other professions. Students will also learn about the inner workings of a professional society, due to the professor’s service as an executive officer of the Society for the History of Technology.

Though historical methods will be stressed in the course, non-history students should find this course useful for providing an understanding of technology and its interactions in society. In previous years' classes, students have come from the disciplines of Science and Technology Studies (STS), History, Technology Education, Curriculum & Instruction, Chemistry, Physics, Biology, Engineering, Landscape Architecture, and Forestry.

Class Schedule (Provisional: dates and topics may change with consent of class participants.)

Jan. 19  
1. Introduction to the course, requirements, etc.

Jan. 26  
2. Background to the history of technology: basic themes and resources of the profession. Ass. #1.


Additional readings


Timothy Aeppel, “Economists Debate: Has all the important stuff already been invented?” Wall Street Journal 16 June 2014. And associated links, found at http://online.wsj.com/articles/economists-duel-over-idea-that-technology-will-save-the-world-1402886301 (if you subscribe to the WSJ, or in Canvas, though without all the comments).
Fun and quick to read, optional


David Nye (#2), “Technology,” unpublished paper from Dr. Nye’s Web site, [http://static.sdu.dk/mediafiles/Files/Om_SDU/Centre/C_Amerika/publications/tech.pdf](http://static.sdu.dk/mediafiles/Files/Om_SDU/Centre/C_Amerika/publications/tech.pdf) or in Canvas resources


Feb. 2.  3. Social history of technology I. The electrification of America. Ass. #2.

Nye book, *Electrifying America*. This Dexter Prize-winning book will provide a good example of an approach to the social history of technology.

Feb. 9.  4. System building, momentum, and the social construction of technology.


Optional


Wiebe E. Bijker, “How is Technology Made? That is the question!” *Cambridge Journal of Economics* 34 (2010): 63-76. (This article updates Bijker’s earlier piece on SCOT.)

Feb. 16.  5. The American system of manufacturing

Hounshell book. This award-winning book deals with the creation of the hallmark American manufacturing system—a theme that dominated much consideration in the formative (and later) years of the field of history of technology.

Feb. 23  6. Thinking about determinism, progress, innovation, and “technology” (and mini-discussion by Hirsh on doing presentations.)


Merritt Roe Smith and Leo Marx, eds., *Does Technology Drive History? The Dilemma of Technological Determinism* (Cambridge, MA: MIT Press, 1994), introduction and “Technological Determinism in American Culture,” ix-35(with lots of pictures!), and any other chapter of your choice.


Optional, or for later reference, on “The Meaning of Technology”

Mar. 2  7. Student presentations. Ass. #3 for students making presentations. Ass. #4 for others.

Mar. 9 Unannounced mandatory exam for entire class period. No studying permitted. Attendance is voluntary, but highly discouraged. Go skiing or go to the beach instead.

Mar. 16  8. Science-technology relationship (Also, student presentation, ass. #3.)
Also, find at least two articles on this topic, including one article on “technoscience” (see Barry Barnes, for example) and one article that deals with the application of science to technology in the policy world. Write a post on your articles too. Examples of the latter include:

Mar. 23  9. Social history of technology II: Gender and technology.

Mar. 30  10. Politics, appropriate technology, and “post-modernism.” Ass. #5. (Also, student presentation, ass. #3.)

Optional
“Fears that innovation is slowing are exaggerated…” Economist (12 Jan. 2013).
“Has the ideas machine broken down?” Economist (12 Jan. 2013).
Steve Woolgar and Geoff Cooper, “Do Artefacts Have Ambivalence? Moses’ Bridges, Winner’s Bridges and other Urban Legends in S&TS,” Social Studies of Science 29 (June 1999): 433-49. (This article is lots of fun, especially after reading the Winner piece.)
Apr. 13  12. Historical studies of “failed” technologies and counterfactual history

Apr. 20.  13. History of military technology. (Also, student presentation, ass. #3.)
Reading: Mindell book and articles and another article of your choice dealing with the theme of the day.

Apr. 27  14. Criticisms of the history of technology, different voices, and course review. Ass. #7 due today (for discussion in class).
Assignments

Upload your doc or docx file to Canvas/Assignments/(Assignment number).

1. Choose a research article (not a book or exhibit review please) from Technology and Culture that illustrates one of the themes from our readings. In a short paper (400 words), explain how the author presents the theme and makes a significant historical argument. How well does the author present the thematic significance? Be prepared to discuss your paper in class.

2. Find three reviews of Nye's book and summarize (in 400 words) the comments and criticisms of the book. What common features do the reviews share? How do they differ? How do you explain the similarities and differences? Also, based on your experiences outside this course, discuss whether you agree with the reviewers or not. Did the reviewers (or author) omit to consider significant themes?

3. Students will choose one Edelstein/Dexter Prize-winning book (one we haven’t read or won’t read in class) and write a critical review. Aside from the normal book review (not a book report—see appendix), you should discuss such things as: What made the book a winner? What broad themes did it develop? What new interpretations did the author advance? Also, read and comment upon at least two published reviews of the book. Feel free to be critical of the Dexter/Edelstein Prize Committee choice, and employ analytical techniques you have developed elsewhere. A list of the prize-winning books is available in Canvas (Files/Course Information). Paper length: 500 words.

All students will present their reviews to the class. Presentations should be timed to last 20 minutes. Moreover, each student will condense his or her written report into a 250-word summary (not an outline) to be distributed to the class (Canvas/Pages/Assignment 3 summaries). Three or four students will make presentations on the day listed in the class schedule (above). The remaining students will present their reviews at the end of “normal” classes, after we discuss the subject listed.

4. In an earlier assignment, you wrote a critical review of a recent book in the history of technology. In this assignment, you will analyze the other main form of scholarly expression—the research article.

Each year, the Society for the History of Technology awards the Usher Prize for the best scholarly work published in Technology and Culture during the preceding three years. Select a group of two or more of these award-winning articles (those we haven’t read or won’t read in class) and characterize the traits of the articles that contributed to their success. In other words, by offering examples, you will describe the positive qualities common to good research articles. No more than half of your report should be devoted to summarizing the content of the articles. Please spend most of your effort examining such matters as: uses of evidence; forms of argument or types of logic; ways of stating problems, questions, or theses; styles of presentation; and interpretive strategies or approaches (i.e., historiographic, methodological, or philosophical presuppositions). Why did these articles beat other articles written during the same year? Try to reach some general conclusions about what constitutes an exemplary research article. As always, feel free to employ skills you developed in other contexts.

The paper should contain 500 words. Include bibliographic citations of the articles (but don’t include them in the word count.)

5. Locate and read two or more articles (or book chapters) dealing with “post-modernism” to gain familiarity with how the concept has been applied to technological and capitalistic enterprises. [One possibility is a portion of David Harvey, The Condition of Postmodernity (Cambridge, MA: Blackwell, 1990). Make sure you list all your sources in a short bibliography.] Then write a 400-word essay explaining how you think (or don't think) the concept can be applied to arguments made by Lovins in this week's reading. Make sure to explain the key elements of “postmodernism” before you argue that Lovins's argument is or is not part of the genre. Alternative assignment: Examine the Lovins article in light of any other coherent interpretative framework that you choose. In other words, read and be critical of Lovins' article by looking at it through the lens of a scholar who pursues interests in Marxism, feminism, environmentalism, political philosophy, or whatever.

6. Identify and read an article that deals with history of science or technology policy in a field that interests you (such as energy, communications, information technology, etc.). Analyze the article by dealing with the following concerns: 1) Describe the general “story” presented in the article. 2) What lesson does the author offer about the nature of policy? 3) Which theme or themes (derived from your readings, especially Zelizer [2000]) does this article exemplify? 4) Does this
article have value to nonhistorians (for example, policy makers)? 5) How should the author strive to make that value available to the policy maker? Paper length: 400 words.

7. Here is an assignment to be thinking about throughout the entire term. Write a short paper on how you think the history of technology fits into science and technology studies. The paper is intended to be integrative. Use experience from other courses, life, or whatever. Think broadly, and write about what you think are the major issues in the STS field and how studies in the history of technology can (or cannot) help address those issues. You do not need to do extensive research outside of what you have already read in this (and other courses). Feel free to be speculative and critical. This 500-word paper is due on the last class meeting, and it will be discussed as part of the class. If you are not an STS student, explain how history of technology fits into your program of study.

Note: For all assignments, include footnotes or a short bibliography of readings you have used for writing your papers.

ALTERNATIVE ASSIGNMENT, INSTEAD of assignments 6 and 7. If you would like to explore in detail some theme that we have studied this semester, you have the option of writing a more classical “term paper” for this course. In that paper, you can choose almost any topic (after consulting with the professor) in the social studies of technology, and write a 10-page paper (word count: 2,500). The paper should be extensively documented (with footnotes or endnotes) and should serve as the basis for a publishable article or thesis later in your graduate career. The paper is due on the last day of class. Please also provide a 250-word abstract of your paper so we can discuss it.

General assignments

Autobiographical introductions and article discussions. I’d like you to provide some introductory information about yourself on the class Canvas page (Canvas/Pages/1). Introductions of class members. You can tell us something insightful or humorous about yourself, an explanation of what you hope to get from this class, your existing views of technology, or whatever. See my contribution, and go from there! This assignment will give you experience in posting to the discussion page (something we’ll do more of during the semester); it will also help us get to know each other better, thus leading to a more enjoyable and productive class experience. Post your contribution before the second class; earlier would be better, so people can read it and respond with scintillating and incisive comments (such as “I also loved the movie, ‘Groundhog Day,’ because it’s a metaphor for humanity’s enigmatic efforts to ascertain ontological truth in the postmodern neoglobal macrocosm.”).

You do not need to learn too much formatting language for posting your comments. Canvas provides basic editing tools after you click “edit” on the pages.

General reading assignment: For each class, every student should be prepared to discuss all the readings. Moreover, each student will chose (or will be assigned) one reading (or one part of the readings). He or she should be especially well prepared to

- summarize the reading,
- discuss the major themes and significance of the reading,
- provide a critique of the reading, noting the author's use of evidence and his/her success in arguing from it.
- speculate on how the themes and approaches could be used as the basis of a future research project.

For your assigned reading(s), please write a short, 1-page outline (using a regular outline style, bullet points, summaries, or whatever) that highlights the major points you will present orally. Submit this outline on the Canvas pages, listed by the topic number. (Example: Canvas/Pages/2. Background to the history of technology.) Other students can (and should!) add to these discussions as appropriate, with links to articles, pictures, personal art, reminiscences, silly (but relevant) stories, etc. Make sure you “sign” your contributions so we know who made them.

Students may also want to perform supplementary readings to answer the following questions: With what other work in the profession does the reading compare? Which work makes its points better? Why? In all of the above, two students may collaborate on the same assignment. In the “real” academic world, people commonly work together on a project. Here is a way to gain some experience.
Nature of this class

This is a seminar class, and its success depends largely on the participation of students. As noted by a colleague, Professor Robert Hatch of the University of Florida, the “[s]eminar discussion has a long tradition and is based on criteria not far removed from those of the ‘critique.’” Professor Hatch provides a set of guidelines that you need to consider in all aspects of seminar communication and when preparing reviews of commonly read texts in this class. Read his criteria at [http://web.clas.ufl.edu/users/rhatch/pages/02-TeachingResources/readingwriting/05surviv.htm](http://web.clas.ufl.edu/users/rhatch/pages/02-TeachingResources/readingwriting/05surviv.htm).

Word counts, “to be,” etc.

Include a word count at the end of each written assignment. (Penalty for none: 5 points.) This strict word-length requirement will help you write clearly and concisely—something that the “real world” greatly appreciates. For extra assistance in reaching this goal, see Jacques Barzun, *Simple and Direct*, a wonderful and easy-to-read primer on good writing. Also, see the short article (in Canvas), “Confessions of a Journal Editor,” which focuses on the value of good editing. “The best editing is like ventriloquism,” writes author Jeffrey Williams. “It makes the edited text sound exactly like you, but better. Shorter, sharper, more orderly.” Follow his advice! (Penalty for papers +/- 10%: 5 points for each 10% increment. The word count should NOT include titles, footnotes/endnotes, or the bibliography—just the body of the paper.)

In each of the shorter assignments (500 words or less), you will lose 0.5 point for using the verb “to be” in any of its forms more than three times. (“To be” is the infinitival form of “am,” “is,” and “are” in all tenses.) In the alternate final assignment, you may use the verb three times per 500 words (15 times for a 2,500-word paper). By consciously avoiding the verb, you will choose more active verbs that yield more interesting papers. (Penalty beyond the limit: 0.5 point per use of “to be.”) Also, make sure you read the PDF chapter by C. Edward Good on “to be.” For more style tips, see Barzun’s book and Hirsh’s writing tips ([http://www.history.vt.edu/Hirsh/writtips.html](http://www.history.vt.edu/Hirsh/writtips.html)).

Other minor (but important) items:

- Give each of your submitted papers a catchy title. A good title helps you crystallize your ideas.
- Use 1.5- or 2.0-line spacing, please.
- Submit your papers in a Word docx (or doc) format via the Assignments feature of Canvas. Title your file using your name and assignment using the following example as a guide: Your Last Name-Assignment Number-5206.docx. Example: Jones-Ass3-5206.docx.

Due dates

Due dates for assignments are fairly strict. Late work will be penalized 10 points per calendar day (weekends included) unless extenuating circumstances have been discussed with me before the due date. (Obviously, some circumstances cannot be foreseen, and they will be dealt with on a case-by-case basis. But please realize that a disk-drive failure that wipes out your paper does not constitute an extenuating circumstance. Make sure you keep backup copies of your work on CDs, memory sticks, on remote servers, etc.) Put these due dates on your calendar and plan your lives accordingly. In the “real world,” missing a deadline often means losing one's job.

Grades

Each student should attend all discussions and be prepared to participate fully. In fact, due to the small size of the class, participation will be necessary to avoid reliance on the professor to lecture.

Grades will be assigned using this formula:

| Assignments 1-6 (12.5% each) | 75% |
| Assignment 7 | 15% |
| (Alt. final assignment: 27.5%) | |
| Class participation, Canvas contributions, etc. | 10% |

The instructor is amenable to changes in topics and other ideas suggested by students. He expects the students to “make or break” the course. In other words, the success of the course depends much on the attitudes and enthusiasm of the students.
Required books


**Appendix: Purpose of a Book Review**

A book review is a standard way for an academic to analyze and criticize the work of other scholars. It is not, however, a “book report,” which simply re-tells the story contained in the book. The review may summarize the book's contents, but more importantly, it reviews the book's thesis and interpretations.

The purpose of a review is:

1) to analyze the validity of the work's main concepts;

2) to criticize (positively or negatively) the book's main thesis. For the scholarly community, the review serves as a major tool by which research is assessed.

The reviewer must not be afraid to evaluate a respected author even though he or she appreciates the effort that has gone into a major work. One can evaluate a book by many methods, of which comparison is the most common. In other words, the reviewer can compare one work to another which has a related thesis, interpretation, or subject matter. Praise or criticism should be backed up with relevant support from these other works.
P2. Technology out of control? Winner (#2) and (#3), and Hong articles. Also, find at least one article on this topic.


Sungook Hong, “Unfaithful Offspring? Technologies and Their Trajectories,” *Perspectives on Science* 6 (Fall 1998): 259-.

3. A look at the classics. Used in fall 2014 course as a test. Worked OK, but chose not to use it in 2016 since I had fewer classes.

In this class, we will continue the discussion from the last class and specifically examine some of the themes pursued in a few of the “classics” of history of technology. To do so, look at http://www.historyoftechnology.org/Resources/classic_works.html and read one of the articles in T&C that revisit the classics. Ideally, choose an article about a book written before 1970 and none that we will read in this class (such as the Cowan book). As you read the review, identify the major themes and methodological approaches used by classics’ authors. Also take note of the criticisms and contributions mentioned by the reviewers. We will discuss these themes and methodologies in class, with each student presenting the book in class. (Don’t forget to post a wiki discussion as well.) Of course, you are free to read the original text as well—or portions of it—but I do not make that a firm requirement since some of the books are lengthy and sometimes a bit tedious.

Readings (besides published books) that you may enjoy (none are required reading)


