Theories of Technological Change: History, Culture, Techniques

Graduate Seminar HSci 8421, Fall 2009
Thursdays 3:35-5:30
Program in History of Science, Technology, and Medicine
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Overview: This seminar examines prominent theories of technological change, against the backdrop of three historical, empirical examples: the printing revolution and the contemporary revolution in electronic communications; industrial revolutions and the current challenge of industrial globalization; and technology’s role in historical/ongoing debates about the meaning and value of human work. Topics include technological determinism, social construction of technology, actor-network theory, and activity theory; communications, orality, literacy, and electracy; semiotics and post-modernity; work, economics, and self; and democracy and the user’s critique of technology.

Format: The seminar is a readings and discussion course, and students are expected to attend and participate in the weekly discussions. Discussion is worth 40% of the course grade.

Weekly Reports: Each student will prepare and pre-circulate a two-page report on the readings for each week. In addition, each student will lead three of the weekly discussions, by giving an overview of the reading and by posing questions to begin discussion. We will assign weeks at the first seminar meeting. Weekly reports are worth 20% of the course grade.

Journal Review: Each student will prepare a report on the last decade of a journal in the field of history, philosophy, or science studies discussing if and how it has addressed the theme of technological change. Examples include History and Technology, History of Technology, Technology and Culture, Isis, and Social Studies of Science. Students are encouraged to propose other journal titles. The journal review is due in class on November 12, and is worth 20% of the course grade.

Term paper: Each student will write a term paper of approximately 15 pages on a question or theme that interests them. The subject must be chosen in conference with the instructor. A proposal is due in class on October 8, a draft is due in class on November 19, and the final paper is due via email or in the instructor’s mailbox on December 17. The term paper is worth 20% of the course grade.

Grading: Grading will be based on participation in discussion (40%), weekly reports (20%), issue report (20%), and the journal review (20%). Please note that students may not pass the course without completing all assignments, and that a grade of incomplete (I) will be given only if a student has already satisfactorily completed the majority of the coursework and if there is a compelling and emergency reason.
Books:

Most of the books we are using will be placed on reserve in Wilson Library. Almost all of the journal articles are available on-line; those that are not will be scanned and made available digitally. You may wish to purchase these two books, which are available at a substantial discount from on-line sources:


Very helpful overview of the principle philosophies of technology, and their development and paths of intersection.


A very measured and thoughtful consideration of the intellectual and practical implications of theories of technological change.

Schedule of discussions and readings:

**Unit I: Foundational themes**

Sept. 10  Thinking about technology

Sept. 17  What is technology?

*Read this, and make a list of terms and concepts you think important:*

Carl Mitcham, *Thinking through Technology: The Path Between Engineering and Philosophy*

Sept. 24  Culture and the agents of change: technological determinism

*Read carefully:*

Jacques Ellul, *The Technological Society*

Martin Heidegger, “The Question Concerning Technology”, 1954, 1977. There are a couple of versions available on-line; I will scan one to use in class.

and do a web search on these two:

Lewis Mumford, *Technology and Civilization*

Siegfried Geidion, *Mechanization Takes Command*

Oct. 1

An empirical case of change: industrialization

*Read:*

Karl Marx, preface, *A Contribution to the Critique of Political Economy*


Andrew Feenberg, “Democratic Rationalization: Technology, Power and Freedom,” *Dogma Revue électronique* URL: http://dogma.free.fr/txt/AF_democratic-rationalization.htm. Feenberg gives an overview of traditional marxist arguments. Please read the first five sections. Sections 1-4 lay out the territory Feenberg will cover, and section 5 will give you the parameters of his own argument.

Feenberg, *Transforming Technology*, Section I, “From Marxism to Radical Critique”

And be aware of the statistics and debates, for more information see:

David Landes, *Prometheus Unbound*

Michael Adas, *Machines as the Measure of Men*

Joel Mokyr, *The Gifts of Athena*


David Chandler, *Technological or Media Determinism* (pdf www.aber.ac.cu.uk/media/Documents/tecset/tdet.html)
Oct. 8  Another empirical case: communications revolutions?  
Writing/printing/digitality

Read:


*Be aware of these two classics:*

Walter Ong, *Orality and Literacy*

Elizabeth Eisenstein, *The Printing Revolution in Early Modern Europe*

*NOTE: Term paper proposal due in class*

Oct. 15  Another empirical case: bodies and work

Read:

David F. Noble, *Forces of Production*


Francesca Bray, “Meanings of Motherhood,” and “Medical History and Gender History,” from Bray, *Technology and Gender: Fabrics of Power in Late Imperial China* (Berkeley: University of California Press, 1997), 275-316

Selection from Manuel Castels, *The Rise of the Network Society* (2nd ed)

*Here are some other important contributions:*

Michel Foucault, *Discipline and Punish*


**Oct. 22**

**Social construction of technology (SCOT): the strong program**

*Read this classic carefully:*

Thomas P. Hughes, *Networks of Power*

*Also read two articles from one of these collections:*

Wiebe Bijker, *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*

Wiebe Bijker, Thomas P. Hughes, Trevor Pinch (eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*

*And read this article:*

Oct. 29  The social shaping of technology: a moderate approach

Read one of these carefully:

Langdon Winner, *The Whale and the Reactor: A Search for Limits in an Age of High Technology*

Donald MacKenzie, *Knowing Machines: Essays on Technical Change*

Familiarize yourself with the terminology Pinch uses in:


And browse the taxonomy of approaches offered by Bray or Sismondo:


Nov. 5  Actor network theory (ANT): sociology and information technology/theory

Read this controversial classic:


Familiarize yourself with Latour’s terminology in:


Look at one of these to become aware of how ANT is used in studies of information systems:


Nov. 12  Activity Theory: Cognition and the making and use of tools

Activity theory is rooted in work by Russian psychologists. Read how American Bonnie Nardi has extended the theory in either:


*Also look at the definitions offered by Nardi and Victor Kaptelinin in:*


*And examine this classic, paying special attention to vocabulary and definitions:*


**Nov. 19**

**Politics, media, and technological change**

Read these two classics, paying particular attention to how they describe the experience of using/viewing new media, such as films (vs making them):

Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment*

**NOTE:** Journal review due in class

**Nov. 26**

THANKSGIVING DAY – NO CLASS

**NOTE:** TERM PAPER DRAFT DUE TO INSTRUCTOR THIS WEEK

**Dec. 3**

**Critical theory and technological change**

Read both of these:

Andrew Feenberg, *Questioning Technology* (London: Routledge, 1999)


*Familiarize yourself with one of these, asking “what is under criticism?”:*

Michel Foucault, *Discipline and Punish*

And if you are of a philosophical bent, look up Herbert Dreyfus’s papers on Heidegger and Foucault:

http://socrates.berkeley.edu/~hdreyfus/index.html

Dec. 10  Does technological change threaten democracy?

Read:

Feenberg, Transforming Technology, Part III, ”The Dialectics of Technology”


Richard E. Sclove, Democracy and Technology (Guilford Press, 1995)

Dec. 17  Presentation of term papers

NOTE: Term papers are due on December 17. Please send them to the instructor by email or leave them in her mailbox in 1100 Mechanical Engineering.