

History 3P81

History of Technology



Tuesday 17:00-19:00
WH203

Autumn 2009

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Course Overview

The history of technology is more than just a history of inventions. It is a history of the search for technological solutions to various problems and of how they changed the human and natural environment. This course offers an introduction to the history of technology since the Industrial Revolution. It looks at power technologies from water wheels to the internal combustion engine, at the development of the electrical system from Edison's lab to household appliances, at communication and transportation networks, such as railways and the Internet, and at different historical interpretations of what technology means, how it develops and how it shapes the human world.

Course Requirements and Marking

1) Essay Outline and Bibliography 10%

A one page description of your essay topic **in full sentences**, including a) the essay topic (what you want to write about), b) your thesis (your question, how you want to look at this topic, what you want to find out and prove), c) your argument (what steps you want to take to prove it and in what order) AND a bibliography of at least EIGHT sources that you think will help you prove it. The bibliography should include at least ONE primary source**, at least ONE book and at least ONE journal article. The bibliography should be properly formatted according to the guidelines given in **Rampolla**, Pocket Guide to Writing History.

You **MUST** submit an essay outline and bibliography. I will not accept your essay if you have not previously submitted the outline and bibliography.

To be submitted at the start of the lecture on Oct. 6.

***Primary sources are material from the time period you are writing about (a text written by Henry Ford, Thomas Edison or James Watt is a primary source). Secondary sources are works written by historians about the topic (about Edison, the spread of steam engines in the nineteenth century, the history of telecommunications in Canada, etc.).*

2) Essay 30%

A research paper of 3000-3500 words on a topic relevant to the course. In this essay you will be expected to demonstrate the use of different kinds of source material and to develop an argument. You are expected to use at least EIGHT sources, including books, journal articles, online-journals and primary source material. At least ONE of the sources should be a primary source, at least ONE a

book and at least ONE a journal article. Be judicious in the use of web resources. Wikipedia, Sparknotes, Encarta and similar sites DO NOT count as acceptable sources. **To be submitted at the start of the lecture on Nov. 17.**

3) Exam 30%

A three-hour exam to take place during the autumn exam period based on the lectures and lecture and seminar readings. Check the calendar for time and date.

4) Seminar Participation 20%

Attendance at the weekly seminars is MANDATORY. You will be expected to do the required readings before the seminar, to prepare questions and observations on this material and to participate actively in the discussion. Seat-warming will get you nowhere.

5) Seminar Presentation 10%

Each student will give a presentation based on a seminar reading, lead the seminar discussion of that week and submit a thesis paper containing a summary of the presentation (1-1½ pages) and discussion questions to the seminar instructor. The presentations should last ca. 10-15 minutes and include a summary of the main points and arguments in the reading.

Formalities

> Seminar attendance is mandatory. More than one unexcused absence may jeopardize your grade.

> Use of the drop-box is at your OWN risk. To ensure that your instructor receives your outline and essay on time, give them directly to your instructor.

> Instructors will consider essay extensions in the case of medical or personal emergencies, but they must be substantiated by documentation and are subject to the instructor's discretion.

> Work handed in late without the instructor's permission will be penalized 5% a day.

> To pass the course, you must complete ALL assigned work AND your average mark for all assignments must be a passing mark.

> Plagiarism will NOT be tolerated. It can lead to punishments ranging from failing the assignment to failing the course to being expelled from the university. Consult the university calendar for academic misconduct procedures. Plagiarism is the use of another

writer's thoughts, words or ideas without giving him/her credit. Paraphrases and footnotes are ways of giving credit to the other writer. If in doubt, ask your TA or consult a standard style manual such as **Rampolla, Pocket Guide to Writing History**.

Course reading:

- 1) David Nye: *Consuming Power* (available at the bookstore and as e-book in the library)
- 2) David Nye: *Electrifying America*
- 3) Course packet
- 4) e-journal articles (available on line and in hard copy in Reserves)

Lecture Plan

1) September 15:

1) Introduction

2) What is technology?

Lecture Reading: Leo Marx, "Technology, A Hazardous Concept", in *Social Research* 64 (1997), pp. 965-988. **e-journal**

Seminar Sept. 18:

Seminar Reading: Robert L. Heilbroner, "Do Machines Make History?", in *Technology and Culture* 8 (1967), pp. 335-345. **e-journal**

2) Sept. 22:

1) Power: Wind and Water

Lecture Reading: David Nye, *Consuming Power*, Chp. 2: Water and Industry, pp. 43-68.

2) Power: Steam

Lecture Reading: David Nye, *Consuming Power*, Chp. 3: Cities of Steam, pp. 71-102.

Seminar Sept. 25:

Seminar Reading: George Basalla, *The Evolution of Technology*, Chp. 1, pp. 1-25 (**in course packet**).

3) September 29

1) Power: Combustion Engines

Lecture Reading: Vaclav Smil, *Creating the Twentieth Century*, Chp. 3: Internal Combustion Engines, 99-121 (**in course packet**).

2) Power: Fuel, Ecology, Scarcity

Lecture Reading: David Nye, *Consuming Power*, Chp. 8: Energy Crisis and Transition, pp. 217-248.

Seminar October 2:

Seminar reading: Trevor Pinch, “The Social Construction of Technology,” in Rober Fox (ed.), *Technological Change. Methods and Themes in the History of Technology*, pp. 17-35 (**in course packet**).

4) October 6:**1) Technological Systems: What is a technological system?****2) Example: Water Supply and Waste Disposal Systems**

Lecture Reading: Maureen Ogle, “Water Supply, Waste Disposal, and the Culture of Privatism in the Mid-Nineteenth-Century American City”, in *Journal of Urban History* 25 (1999), pp. 321-347. **e-journal**

October 9: No seminar**5) October 13****1) What is Electricity and what is it good for?**

Lecture Reading: Patricia Fara, *An Entertainment for Angels. Electricity in the Enlightenment*, pp. 42-61 AND Benjamin Franklin, *Experiments and Observations on Electricity*, 213-216; 222-223; 241-244 (**in course packet**).

2) Edison and the Invention of the Electrical System

Lecture Reading: Thomas Hughes, “The Electrification of America. The System Builders”, in *Technology and Culture* 20 (1979), pp. 124-161. **e-journal**

Seminar October 16

Seminar Reading: *Thomas Hughes: The Evolution of Large Technological Systems* (**in course packet**).

6) October 20**1) The Business of Electricity**

Lecture Reading: Thomas Hughes, “Harald P. Brown and the Electrocutitioner’s Current,” in *Business History Review* 32 (1958), 143-165. **e-journal**

2) National Electrification

Lecture Reading: David Nye, *Electrifying America*, Chp. 4: What was Electricity?, pp. 138-184.

Seminar October 23

Seminar Reading:

Timo Myllyntaus, “The Transfer of Electrical Technology to Finland,” in *Technology and Culture* 32 (1991), pp. 293-317. **e-journal**

AND:

Edmund N. Todd, “Industry, State, and Electrical Technology in the Ruhr Circa 1900”, in *Osiris* 5 (1989), pp. 242-259. **e-journal**

7) October 27**1) Electricity at Work**

Lecture Reading: David Nye, *Electrifying America*, Chp. 5: Flexible Factory, 185-237.

2) Electricity at Home

Lecture Reading: David Nye, *Electrifying America*, Chp. 6: A Clean, Well-lighted Hearth, pp. 238-286.

Seminar October 30

Seminar Reading: Ruth Schwarz Cowan, "The 'Industrial Revolution' in the Home", in *Technology and Culture* 17 (1976), pp. 1-23. **e-journal**

8) November 3**1) Networks: Pre-Industrial Transportation and Communication Networks**

Lecture Reading: Daniel Headrick, *When Information Came of Age*, Chp. 6: Communicating Information, pp. 181-203 (**in course packet**).

2) Railways

Lecture Reading: Ben Marsden and Crosbie Smith, *Engineering Empires*, Chp. 4, Building Railway Empires, pp. 129-136; 156-177. (**in course packet**)

Seminar November 6:

Seminar Reading: Ruth Oldenziel, "Boys and their Toys," in *Technology and Culture* 38 (1997), pp. 60-96. **e-journal**

9) November 10:**1) Urban Transportation and Urban Environments**

Lecture Reading: David Nye, *Electrifying America*, Chp. 3: Crosstown Transfer, 85-137.

2) Fordism and Twentieth-Century Factories

Lecture Reading: David Nye, *Consuming Power*, Chp. 5. Industrial Systems, pp. 131-154.

Seminar November 13

Seminar Reading: Lindy Biggs, "The Engineered Factory," in *Technology and Culture* 36 (1995), pp. 174-188. **e-journal**

10) November 17**1) Automobile and Cultural Change**

Lecture Reading: Ted Steinberg, *Down to Earth*, Chp. 13: America in Black and Green, 206-225 (**in course packet**)

2) Aviation

Lecture Reading: Bernhard Rieger, *Technology and the Culture of Modernity in Britain and Germany, 1890-1945*, Chp. 5, 116-138 (**in course packet**)

Seminar November 20

Seminar reading: Clive Trebilcock, “‘Spin-off’ in British Economic History: Armaments and Industry, 1760-1914, in *The Economic History Review* 22 (1969), 474-490. **e-journal**

11) November 24**1) Telegraphy**

Lecture Reading: Bruce Hunt, “Doing Science in a Global Empire: Cable Telegraphy and Electrical Physics in Victorian Britain”, in Bernard Lightman (ed.), *Victorian Science in Context*, pp. 312-333 (**in course packet**).

2) Telephony

Lecture Reading: Ruth Schwarz Cowan, *A Social History of American Technology*, Chp. 11: Communications Technologies and Social Control, 273-300 (**in course packet**).

Seminar November 27:

Seminar Reading: Michele Martin, ‘Hello, Central?’ *Gender, Technology, and Culture in the Formation of Telephone Systems*, pp. 3-10; 50-52; 56-67 (**in course packet**).

12) December 1:**1) Computers and Internet**

Lecture Reading: Jon Agar, *The Government Machine*, Chp. 9, 343-366.

2) Conclusion

no seminars this week

Suggested Essay Topics/Questions

Why would a manufacturer or mine owner switch from a natural source of power to the steam engine? What would speak against making this change?

What factors contributed to/detracted from the spread of the steam engine?

Discuss the development of hydroelectric power in Ontario.

Compare and contrast the electrification of TWO of the following: Berlin, London, Chicago, the Ruhr, Russia, Middletown, Ontario (any other suggestions?).

How did technology change the way people worked in the nineteenth and early twentieth centuries and the kind of work that they did?

Discuss the interaction of business interests and technological development. Develop your argument using at least ONE but no more than TWO examples.

How did technological change affect women's work in the paid labour force and in the home?

Discuss the development of the railway OR telecommunications network in ONE of the following: Britain, Germany, Canada, US, France (any other suggestions)?

Discuss the relationship between technology and the growth of cities. Develop your argument using at least ONE but no more than TWO examples.

How did developments in transportation technologies affect population geography?

What are the "technologies of Empire," and what does this mean?

The telegraph has been called the "Victorian Internet." Is this analogy applicable? In what ways are telegraph and internet similar? In what ways are they different?

How do new transportation and communication technologies affect perceptions of space and time?

Does political conflict drive the process of technological innovation? Develop your argument using examples.

Discuss the example of the bicycle as a socially constructed technology.

*** These suggestions are only to get you started. Use the *History of Science, Technology and Medicine Database* to find out what else is out there on potential topics and literature.