

## History 341.001: Technology in History

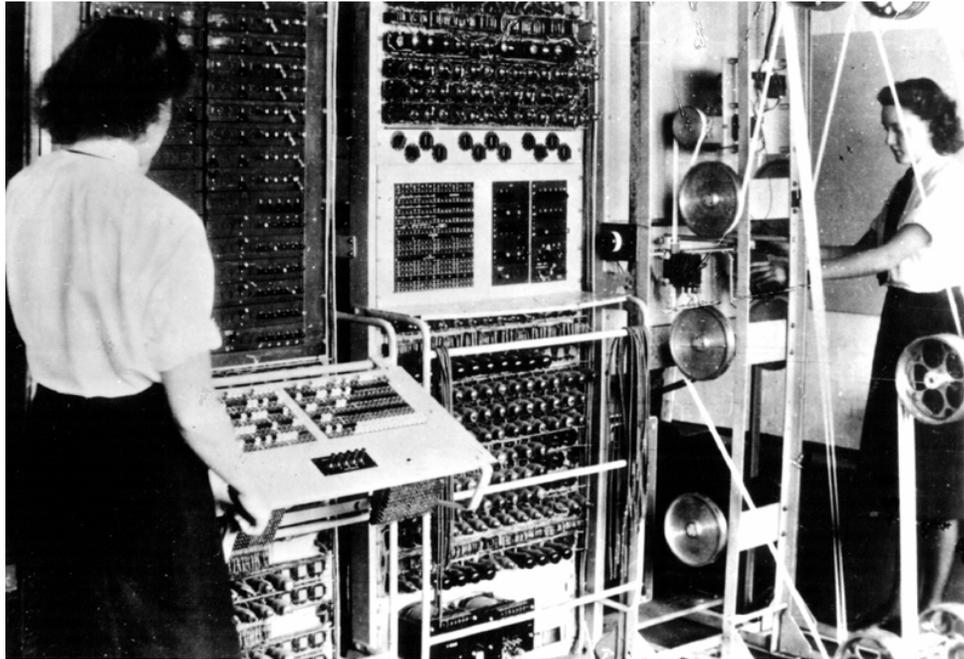
Spring 2011

MW 4:30-5:45pm, Withers 140

Dr. Hicks

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Office Hours after class (by appointment) in Withers 262



Colossus computer and operators at Bletchley Park (England, 1944)

### Course Description

Did you know that the atomic bomb helped create facebook? Or that British computing pioneers played a critical part in winning World War II, with a computer that was kept secret until the 1970s? Did you know that C3PO (of Star Wars fame) was "born" in 1927 in Germany? How about the fact that the largest ship recycling operation in the world is located on a dockless beach in India? This course explores technological achievements in history, and their social, political, economic, and ethical contexts. Throughout, we will investigate our technological past to better understand current and future developments. The course incorporates work from history, science and technology studies, investigative journalism, documentaries, and science fiction to analyze how technological systems and tools mold human culture and help create western ideals of progress.

During the semester, we will explore the role of technological artifacts and technological systems in society from the middle ages to the present. In studying the social contexts of major technological achievements we will learn how technological objects and tools participate in molding human culture and values. We will also investigate how the history of technology has been written into broader economic, political, and social historical narratives, as we examine the impact of technological innovations and adaptations on western civilization. Throughout the course, we will use the historical record not only to study the advancements in technology people have made over time, but also to understand the different ways that technology and society have shaped each other, and how they continue to do so.

## Course Requirements

I expect that all assignments you pass in for this course will be your own original work and will properly attribute credit to the sources you have used. Your conduct in this class, including all email correspondence, and your work and on all class assignments should also adhere to NCSU's code of ethics ([http://history.ncsu.edu/ug\\_resources/plagiarism\\_honor\\_code](http://history.ncsu.edu/ug_resources/plagiarism_honor_code)).

See <http://history.chass.ncsu.edu/courses/coursepolicy.htm> for the History Department policy on adding, dropping, and waitlists. Please note, however, that it is your responsibility to ensure that you are off the roll by the drop deadline if you drop the class.

Accommodations will be made for students with verifiable disabilities. To take advantage of these, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information see the [Academic Accommodations for Students with Disabilities Regulation \(REG02.20.1\)](#). Please speak with me after class during the first or second week if you need to take advantage of these provisions so we can set things up.

Class Attendance & Participation	(20%)
Reading Quizzes	(20%)
Midterm (in class)	(15%)
Group Project	(15%)
Final Exam	(30%)

Please come to class ready to participate and show that you have done the reading, as well as to listen. Occasional short, in-class, reading quizzes may be given to make sure that everyone is keeping up with the reading (roughly 3-5 during the term). If you choose to bring a laptop, please limit your laptop usage to note-taking to minimize distraction: you will be expected to be present intellectually (not just physically) in order to earn your attendance and participation grade.

There will be a midterm and a final in this course, as well as a group project due near the end of the term that you will present in class. An overview of the group project can be found at the end of the syllabus.

The final exam will be based on the lectures and readings. The final exam is very important: your responses to it should show me that you can synthesize and apply the knowledge you have learned in the course. For this reason, I reserve the right to fail a student for the course who fails the final exam, regardless of the grades earned on other components of the course. This shows an inability to retain and apply what you have learned during the course and makes it impossible for me to give a truly representative grade.

I will offer some opportunities for extra credit work during the term. If you have an idea for an extra credit assignment that you would like to do, feel free to discuss it with me.

## Books and Readings

*From Leonardo to the Internet* by Thomas Misa and *Medieval Technology and Social Change* by Lynn White Jr. will be available in the bookstore. In addition, there will be readings on e-reserve (some will be posted on the course Vista site, the rest will be on the library's e-reserves system).

**Class Schedule** (Please come to class having done the readings listed for that day.)

- M 1/10            **Introduction**  
The Graphing Calculator Story: Listen to Part 2 “Should I Stay or Should I Go?” Beginning at 26:45 minute mark, end at 38:55:  
<http://www.thisamericanlife.org/radio-archives/episode/284/should-i-stay-or-should-i-go>  
Or read the story of Graphing Calculator 1.0:  
<http://www.pacifict.com/Story/>  
Discussion: What is the role of the individual in a large technological system? Is the case of Avitzur and Robbins an exception that proves the rule that individuals don’t have much power to change large, institutionalized systems?
- W 1/12            **Historiography and Theorizing Change**  
Vincent di Norcia, “Technological Complexity and Ethical Control” (7 pp.)  
Langdon Winner “Do Artifacts Have Politics?” (17 pp.)
- M 1/17            NO CLASS: MLK DAY
- W 1/19            **Actor-Network Theory, SCOT, Systems Theory, and Technological Determinism**  
Bruno Latour “Where are the Missing Masses” (36 pp. but rather dense, so leave extra time to read it.)  
Class discussion/debate: How do Winner’s and Latour’s theories of technological change differ? Which one do you agree with more? Why?
- M 1/24            **Medieval Technology and Technological Momentum, and Determinism**  
Thomas Hughes, “The Evolution of Large Technological Systems” pp. 51-55, pp. 62 “Development” to p. 70, and p. 76 “Momentum” to p.80 (16)  
Begin reading Lynn White, *Medieval Technology and Social Change*, chapter 1
- W 1/26            Lynn White, *Medieval Technology and Social Change*, finish reading ch. 1 and also read ch. 2  
Class discussion/debate: Do you agree with White’s idea that “a technology merely opens a door” but does not compel one to enter? Does White’s own analysis actually support this?
- M 1/31            **Technology as an Instrument of Civilization and Discussion of Documentary Sources and the Practice of History**  
*Leonardo* Ch. 1: Technologies of the Court  
Assignment of Groups and Project Topics
- W 2/2            Movable Type Experiment (in class)  
*Leonardo* Ch. 2: Technologies of Commerce  
Discussion: Compare the Dutch Tulip Bubble with the Mortgage-backed securities crisis in the housing market that came to a head in 2008. What are the similarities? What historical lessons can we learn from analyzing the Dutch case?
- M 2/7            **Technology and Economic Modernity**  
*Leonardo* Ch. 3: Industrialization  
Read selections from “The Lowell Offering” (c. 1840s) on Vista  
Read Factory Rules from *The Lowell Handbook*, 1848:  
<http://www.kentlaw.edu/ilhs/lowell.html>

- W 2/9            **Industrialization (continued)**  
*Leonardo* Ch. 4: Empire  
Discussion: How does the concept of empire relate to our current experience? Is there such a thing as imperial power anymore? If so, what are the similarities and differences between current imperial power and the imperial power of, for instance, Britain in the 19<sup>th</sup> century—particularly in terms of technology?
- M 2/14            Film (watch in class): *Carnegie, Richest Man in the World*  
 Discussion Questions handed out. Note that questions on the themes and information presented in the film are likely to appear on the exams.  
 Look at Carnegie timeline linked on Vista.  
 (Take this opportunity to catch up on any missed readings for the upcoming midterm exam)
- W 2/16            Finish Carnegie Film  
 Brief lecture/discussion  
*Leonardo* Ch. 5: Science and Systems
- M 2/21            **Robots, Autos and Other Late Products of Industrialization**  
 Isaac Asimov, “Runaround” (short story, published 1942):  
[http://www.rci.rutgers.edu/~cfs/472\\_html/Intro/NYT\\_Intro/History/Runaround.html](http://www.rci.rutgers.edu/~cfs/472_html/Intro/NYT_Intro/History/Runaround.html)  
 R. Kline and T. Pinch, “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States” *Technology and Culture* 37, No. 4 (October 1996): pp. 763–95.  
Class debate/discussion: How much power do users have over a mass-produced consumer technology? Do you think the examples of user intervention (both creative and destructive) in the Pinch and Kline article are analogous to any current examples?
- W 2/23            **The Spread of Industrial Precepts Outside the Factory**  
 Ruth Schwartz Cowan, “The ‘Industrial Revolution’ in the Home: Household Technology and Social Change in the 20th Century” pp. 1-23  
 Read *Leonardo* Ch. 6: Materials of Modernism  
Discussion: What shapes our view of modernity? What shapes our view of the future? If the future is something we design and build, not just something that happens, where do we get our ideas and ideals from?
- M 2/28            **Weaponry and Industry (cont.)**  
*Leonardo* Ch. 7: Means of Destruction  
 Ronald Arkin, “Ethical Robots in Warfare” from *IEEE Technology and Society Magazine* pp. 30-33  
To think about: How do Arkin’s ethical quandaries relate to our discussion of the atomic bombs? Should ethical frameworks influence the design of weaponry?
- W 3/2            **MIDTERM EXAM (in class)**  
 (Midterm will cover all materials in the course up to this point)

3/7-3/11 SPRING BREAK

- M 3/14      **Computing and the Rewriting of Technology's History**  
 J. Light, "When Computers Were Women" (30 pp.)  
 Martin Davis, *Engines of Logic*, selected pages (25 pp.)  
Optional: Look at the Computer History Museum's timeline of computing developments at: <http://www.computerhistory.org/timeline/>
- W 3/16      **Hands-On History**  
 "Nutty Slack" articles from London *Times* (in folder on Blackboard)  
 \*\*\*Make sure to bring print-outs of these articles to class\*\*\*  
Important: Group work in class & topics assigned.
- M 3/21      **Entering a Postindustrial World**  
 Film: *Dounreay, The Atomic Dream* (BBC Scotland, 2006, 59 min)  
 Discussion Questions handed out.  
 Reading: Peter Thorsheim, "Interpreting the London Fog Disaster of 1952."
- W 3/23      **Rethinking Industrialization: Early Anti-Pollution Initiatives and the Rise of Consumer Rights**  
  
 Ralph Nader, Excerpts from *Unsafe At Any Speed* (1965):  
 Chapter 4 "The power to pollute: The smog that wasn't there," pp. 147-164 (18)  
 Chapter 3 "The Second Collision" pp. 81-105 (13)  
 Chapter 2 "Studies in Automotive Time Bombs" pp. 42-60 (19)  
 "What the World Needs Now is DDT" article from the *New York Times*  
To think about: Why did Detroit resist catalytic converters for so long? Was it a case of technical incompetence or business savvy?
- M 3/28      **Agribusiness and GM Foods**  
 Eric Schlosser, Excerpts from *Fast Food Nation: The Dark Side of the All-American Meal*, pp. 136-144 from Ch. 6 "On The Range," and pp. 111-131 from Ch. 5 "Why the Fries Taste Good"  
 And selected short articles and web links on Agribusiness and GM Foods (in folder on Vista)  
Class discussion: What are the virtues and dangers of "negative labeling" of food?
- W 3/30      **Techno-Social Networks**  
 Jameson Wetmore, "Amish Technology" *IEEE Technology and Society Magazine* (2009) pp. 10-21  
 Kevin Kelly "Amish Hackers" blog posting on The Technium:  
[http://www.kk.org/thetechnium/archives/2009/02/amish\\_hackers\\_a.php](http://www.kk.org/thetechnium/archives/2009/02/amish_hackers_a.php)  
 Leonard Kleinrock, "History of the Internet and Its Flexible Future" *IEEE Wireless Communications* (Feb. 2008) pp. 8-18  
Class discussion: What are the similarities between the social and data networks discussed in these three articles? If technologies have the power to transform users and communities, who should be responsible for ensuring that these changes are progressive, or at least not harmful? Who gets to decide what progress means? What do you think of the concept of "slow hackers"? Are there any other cultural precedents for this concept?
- M 4/4      **Important:** Group work and mandatory group project meetings (missing this class will negatively affect your group project grade). See last page of syllabus for the assignment you must do in preparation for this class period.

- W 4/6            **Globalization**  
 Film: *Shipbreakers* (of Alang) dir. Michael Kot  
*Leonardo* Chapter 8  
 Optional Reading: Pulitzer Prize winning articles on Alang shipyards from the *Baltimore Sun*: <http://www.pulitzer.org/works/1998,Investigative+Reporting>
- M 4/11            Trivia Quiz/Final Review
- W 4/13            **Group Presentations**—19<sup>th</sup> and 20<sup>th</sup> c. technologies (5 groups)
- M 4/18            **Group Presentations**—20<sup>th</sup> c. technologies (5 groups)
- W 4/20            **Group Presentations**—20<sup>th</sup> and “21<sup>st</sup>” c. technologies (4 groups)
- M 4/25            **Are Unintended Consequences Really Unintended?**  
 Norman Balabanian, “On the Presumed Neutrality of Technology” (pp. 15-25)  
 “Google Alters its Method of Ranking Search Results” article (on Vista)  
Discussion: How do we define intention when it comes to a very big or very complex technology? Whose intentions are we talking about? Relatedly, where do we draw the line between harmful and helpful technology? Is it possible to make any standards that would apply to a broad community of users (for instance, the entire U.S. population, or the entire world wide web using population)?
- W 4/27            **Course Summation: Technological Maturity, “Hype Cycles,” and Beyond**  
 Selection of current news articles (on Vista): “Against Headphones,”  
 “Facebook Wins Relatively Few Friends in Japan,” and “1986 Privacy Law is Outrun by the Web”  
*Leonardo* Chapter 9

**Final Exam: Wednesday, May 11<sup>th</sup>, 1:00pm to 4:00pm in Withers 140**

## **Group Project Assignment Overview:**

For part of one class near the end of the semester, you will be responsible for presenting a topic to the class, working in a group with several other students.

Your group will research your assigned topic through historical newspaper archive databases like the *New York Times*, *London Times*, or *Times of India*. Using these historical articles, and the background that you have learned in class, you will give a brief group presentation (about 12 minutes) that constructs a mini-history from the articles you chose that focuses on what these articles tell us about the historical interaction of contemporaneous individuals, or the contemporaneous society, with your assigned technology. We'll discuss more details and assign topics later in the semester. We will also do group work earlier in the term that will help prepare you for this exercise.

This exercise allows you to delve more deeply into a specific topic than we have time for in class and to construct your own mini-technological history; it gives you a chance to practice historical research methods; and it encourages you to leverage the expertise of several people to gain insight into the often-contested process of historical interpretation.

**On April 4<sup>th</sup> you will be given a full class period to meet with your group. You will each need to have done preparation in advance of this class in order to make the most of it.** Each student will bring in 2 historical articles on their group's assigned topic. Have ideas about why each article you chose is important. The group will then choose THREE articles in total that they think fit together to create a historical narrative, best represent their topic, and offer the most insight into the interaction of the technology with its social context.

**Attached PDFs (not URLs) of the articles each group has chosen should be posted in the designated discussion board thread on the course's Vista site that same day before midnight.** Each group should decide that day in class how they plan to present their topic to the class, and finalize remaining plans by meeting after class in person or in the designated "sandbox" thread for your group on the course's Vista discussion board.

### **A note on delivery:**

It's a well-worn axiom that perhaps the least efficient way to accomplish something is to do it by committee. Working in concert with others is also unavoidable, and when done correctly, can be extremely rewarding and lead to startling insights you could not have arrived at working alone.

Your group work should not just be an accumulation of individual group members' work. Your final group project should strive to be more than the sum of its parts by leveraging the talents and skills of all group members and fitting them together in way that transcends what you'd have been able to do working alone.

### **Some pointers to achieve this:**

**Don't** fall into the trap of just summarizing the articles.

**Don't** atomize the presentation by having a person talk about each article in turn.

**Don't** google or use wikipedia to come up with factoids about your technology.

**Don't** talk for too long—we need to fit all the groups in!

**Do** have an overarching argument that ties your presentation together.

**Do** pull out interesting details from the articles and tell us why they're historically relevant.

**Do** show change over time with your article choices.

**Do** re-read relevant parts of the Misa textbook to help inform your analysis.

**Do** talk to your group members early and often in person and/or on the Vista discussion boards.

**Possible extra credit:** In order to encourage the best effort possible from all group members, in addition to getting a standard grade on the project, the group that does the best in conveying their topic to the class will receive an extra 2 points on their final exam grade, while the 2<sup>nd</sup> best group will receive an extra 1 point.