

CRD 118, 4 units
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Brief Course Description

This class explores the relationships between technology and socio-economic world. Few of us reflect upon how technology develops or why it develops in the ways it does, even though it plays a fundamental role in nearly all of our activities even the most personal ones. The purpose of this course is to develop a theoretical and historical understanding of how technology evolves and then use these understandings to examine some topics regarding technological development and contemporary society. By the end of the course, my hope is that you will have a better understanding of why our everyday technologies have evolved in the way they have. I also hope you will have a better understanding of how we, ourselves, and our social, economic, and political system affect this evolution.

Technologies are socially constructed, which means that they have race, ethnicity, gender, class, and many other values embodied within them. They empower us to do things and, at times, they confront us as social/physical facts. They also have unanticipated and even unseen consequences. They structure our understandings of the world around us. This does not mean we are helpless, but they do frame our actions. Of course, we can change their meaning through redefining how they work, what they do, and for what they should be used. These are socio-political choices, but this does not mean that it is easy to change these technologies to be more democratic or to be geared to other ideals than profitability or reinforcing power and economic relationships. Many of the wealthiest people in the world became that way by exploiting new technologies.

Human beings are constantly creating new things for our use and abuse. These objects create new needs such as for a smartphone, personal computer, side-impact air bags, genetically engineered plants and animals, etc. There are “micro” technological changes such as, for example, the adoption of Pringles snacks that have only minimal impacts -- we become a bit more obese and generate a bit more waste. In other cases, such as the smartphone or internal combustion engines, the changes are so profound that we can say that they transformed the way society is organized.

And yet, we know little about why and how these artifacts came to populate our world and structure our lives. In the modern era, when we perceive a problem, then we call upon our technologists to solve it. Technical fixes are a preferred remedy. Even when there is no problem, businesses are trying to create new needs and define new problems. As human-developed objects, technologies are not neutral, they have politics, social structures, and many other values designed into them. For example, consider the role of privacy in a world where firms can peer into the computers upon which we store our most intimate details. The technologies that groups or societies create and use tell us much about the power relationships and ethics of that society. In today's technology-centric world, we often measure other societies by their technologies, not their moral or ethical values. Finally, and most important, technological artifacts shape our lives and are powerful forces in structuring our actions. Today, our technologies have become so powerful and all-pervasive that they are part of what and who we are including our flesh, bones, blood, which increasingly are polluted by plastics, long-lasting chemicals, and other human-made materials in our world. Our technologies have made us so powerful that some

believe we are destroying our planet and ourselves with it. This is even as the world's wealthiest and most powerful countries and people are exploring leaving our world for other planets.

My personal position is that I am deeply concerned about our technologies and how they are increasing inequality and profoundly polluting our planet. My belief is that we need to control these technologies democratically and try to apply them to ameliorate the problems we face as people living on this earth or Gaia, as some people refer to our planet. Having said this, my goal in this course is to give you an understanding of how technology has evolved under capitalism over the last 300 years -- an era that may now be ending as China with its different culture and history begins affecting the globe.

Required Readings

1. All readings are on the class Canvas web site under "Files."
2. Parts of one book are required (you can buy it on Amazon. However, I have scanned the assigned portions and they are on class website):
Arthur, W.B. 2009. *The Nature of Technology* (New York: Free Press).

Grading

Your grade will be given on the basis of the following products:

1. Four unannounced quizzes (drop one - 10% each) 30%
The quiz will be time-limited to 10 minutes and it cannot be made-up. However, the lowest quiz will be dropped.
2. Final Paper that will be due on day of final will be a four-stage process and comprise 70% of your total grade.
 - a. On **October 9, 2023**, you should submit the idea for your paper for comments by the TAs and/or the instructor. I will return it to you on **October 11, 2023** with comments and ideas. Essentially, we will decide whether the topic is a good one that will be doable. I will discuss choosing a topic during class. This is required and, if you do not hand in the topic you will be unable to finish the class. It will be worth **5%** of the grade.
 - b. On **October 30, 2023**, a 1–2-page outline double-spaced with Headings and Sub-headings will be due. It will be worth **5%** of the grade, but it is mandatory to move to the next stage – no outline, no grade for the paper.
 - c. On **November 22, 2023**, you must submit a draft of your paper for the TA and me to comment upon. This draft does not need to be a complete paper, but it should include the following:
 1. An introduction with thesis
 2. Exploration of one of the ideas mentioned in their thesis/intro (body paragraphs).
 3. Utilization of at least two readings

This portion of the paper assignment will be **20%** of the final grade. You will be graded on the quality of the introduction, the coherence of the thesis, exploration of the ideas, and how were using the two (or more readings) to elucidate the topics of your paper. We will try to return them on **November 29!**

- d. The final paper will be due on the day and time of the scheduled final. The final paper accounts for **40%** of the total grade.

The final original research paper is meant to acquaint you with the evolution of a technological artifact in greater depth. Any technology or artifact is acceptable for the paper, after it is approved. The paper should be approximately fifteen pages in length. For the paper you will choose any product or item you wish and you will trace its evolution through time and you should integrate the theories we have learned in the class into the paper to provide an understanding of the evolution of the artifact. The integration of the readings into the paper is mandatory. Any paper that does not refer to and use the readings will receive no higher than a C

– the better the integration, the higher the grade. I have posted previous “A” and “bad” papers on the Canvas website.

The paper should be typed double-spaced on one side of the page. Please use a Times type, 12 pitch, double-spacing. References to any written materials must be APA style (Kenney 2014:2). **Everyone must provide an electronic copy of the paper emailed as an attachment.** The paper will be due on the date and time of the final examination as published in the catalog.

The paper should begin with a title page including your name, the class, date, instructor etc.

You will be given a chance on the last day to make a five-minute presentation on their research. I really encourage you to make the presentation, as being able to talk about what you are writing is vital to producing a great paper.

TOTAL 100%

Student Code of Conduct

All students should be familiar with the Student Code of Academic Conduct that is located here <http://sja.ucdavis.edu/cac.html>. Please review this carefully and ask your instructor, if you have any questions. Remember the instructor is obliged to refer you to Student Judicial Affairs in all cases of violation or suspected violation.

In addition to the well-known cases of plagiarism and cheating on examinations, it is also a violation of the Code of Conduct to use your own written materials from papers prepared for other classes, unless you take the following points into consideration.

It is permissible to use materials and texts from other class projects, within CRD or in other departments, under these conditions:

- (1) You inform the instructor beforehand.
- (2) You clearly identify the portions where you quote yourself (or collaborative work)
- (3) You provide a copy of the previous work you have submitted in the other class to the instructor.
- (4) To ensure that you receive a good grade make sure that it fits seamlessly into the assignment for THIS class.
- (5) If you have any doubts about the extent to which you can use already written materials, talk to the instructor or the TA prior to making any submission.

Required Readings

Readings are an essential part of the course and, though not necessarily duplicated in the course lectures, are a necessary background for discussion. They will be necessary to adequately participate in the class and you will be responsible for knowing this material for quizzes.

Wednesday, September 27 – Introduction and discuss syllabus etc.

Monday, October 2 – Why Is Technology Important? (in-person)

- Pope Francis. (2015) Encyclical Letter: *Laudato Si’* of the Holy Father Francis on Care for our Common Home, pp. 1-44 and 75-101. (Please ignore the religious part and consider what is being said about technology).

Wednesday, October 4 - What Is Technology?

- Arthur, W.B. (2009) *The Nature of Technology*. New York: Free Press. pp. 9-67.

Monday, October 9 – Marx on Technology (Paper idea due) (in-person)

- Rosenberg, N. (1976). Marx as a Student of Technology. *Science, Technology and the Labour Process*. pp. 8-31.
- Marx, K. (1847). *Communist Manifesto*. Redacted by M. Kenney.

Wednesday, October 11 – Technological Evolution

- Basalla, G. (1988). *The Evolution of Technology*. New York: Cambridge University Press. pp. 1-63.
- Friedel, R. (1994). The History of the Zipper. *Invention and Technology*. Summer, pp. 8-16. Retrieved from: http://www.americanheritage.com/articles/magazine/it/1994/1/1994_1_8.shtml

Monday, October 16 – Evolution (in-person)

- Arthur, W.B. (2009). *The Nature of Technology*. New York: Free Press. pp. 167-202.

Wednesday, October 18 – Evolution Illustrated

- Gladwell, M. (2002). Smaller: The Disposable Diaper and the Meaning of Progress. Retrieved from: http://www.gladwell.com/2001/2001_11_26_a_diaper.htm.
- Courage, K. H. (2022). The sucky history of the breast pump. *Smithsonian Magazine* (September 12)
- Petroski, Henri. (1993). *The Evolution of Useful Things*. New York: Knopf. pp. 3-21 & 51-76.

Monday, October 23 –Path Dependence, Standards, and Lock-In (in-person)

- David, P. (1985). Understanding the economics of QWERTY: The necessity of history. In W. Parker (Ed.) *Economic History and the Modern Economist* (Oxford: Basil Blackwell): 30-49.
- Brunsson, N., Rasche, A., & Seidl, D. (2012). The dynamics of standardization: Three perspectives on standards in organization studies. *Organization Studies*, 33(5-6), 613-632.

Wednesday, October 25 – Technology and Intellectual Property

- From the U.S. Patent and Trademark Office please read:
 1. What is a patent?
 2. Patent laws.
 3. What can be patented?
 4. Novelty and other conditions for obtaining a patent
- The URL is: <http://www.uspto.gov/web/offices/pac/doc/general/>
- Beauchamp, Christopher. (2010). Who invented the telephone? Lawyers, patents, and the judgments of history. *Technology and Culture*. 51:4, 854-878.
- Please play around with Google Patent. Check out patents from 1820 and today to see how they were written.

Monday, October 30 – Social Construction of Technology (1-2 page outline due) (in-person)

- Pinch, T. and Wiebe, B. (1987). The social construction of facts and artifacts. *The Social Construction of Technological Systems*. Cambridge, Massachusetts: MIT Press. pp. 17-47 (skim pages 17-28, read carefully pages 28-47).

- Latour, B. (1991). Technology is society made durable. *A Sociology of Monsters: Essays on Power, Technology, and Domination*. London: Routledge. pp. 103-131.

Wednesday, November 1 -- Social Construction Examples

- Pinch, T. (2002). Why you go to a music store to buy a synthesizer. *Path Dependence and Creation*. New York: Lawrence Erlbaum Associates. pp. 381-399.
- Parthasarathy, S. (2022). How sanitary pads came to save the world: Knowing inclusive innovation through science and the marketplace. *Social Studies of Science*, 03063127221122457.

Monday, November 6 – Socio-Technical Transitions (in-person)

- Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research policy*, 31(8-9), 1257-1274.
- Anfinson, M. (2021). Between stability and change: Tensions in the Norwegian electric mobility transition. *Social Studies of Science*, 51(6), 895-913.

Wednesday, November 8 – Technology and Politics

- Winner, L. (1980). Do artifacts have politics? *Daedalus* 109 (1). Pp. 121-136.
- Kreiss, D. (2016). Back into the Breach: Sanders, Clinton, and the Democratic Party’s data. *Cyborgology*. <https://thesocietypages.org/cyborgology/2016/02/29/back-into-the-breach-sanders-clinton-and-the-democratic-partys-data/>
- Talbot, D. (2008). How Obama really did it. *Technology Review*.
- Fujiwara, T., Müller, K., & Schwarz, C. (2021). The effect of social media on elections: Evidence from the United States (No. w28849). National Bureau of Economic Research. {read abstract, introduction, and conclusion, only skim the rest}.
- Fandos, N. and Roose, K. 2018. Facebook identifies an active political influence campaign using fake accounts. *New York Times* (July 31) <https://www.nytimes.com/2018/07/31/us/politics/facebook-political-campaign-midterms.html>

Monday, November 13 –Feminism and Technology (in-person)

Required:

- Lundquist, J. H., & Curington, C. V. (2019). Love me Tinder, love me sweet. *Contexts*, 18(4), 22-27.
- Wajcman, J. (2010). Feminist theories of technology. *Cambridge Journal of Economics*, 34(1), 143-152.

Optional:

- Ford, H., & Wajcman, J. (2017). ‘Anyone can edit’, not everyone does: Wikipedia’s infrastructure and the gender gap. *Social Studies of Science*, 47(4), 511-527.
- Haraway, D. J. (1985). Cyborg manifesto: Science, technology, and social-feminist in the Late 20th Century. *Social Review*, 80, 65-108.

Wednesday, November 15 -- Technology and Imperialism

- Mokyr, J. (1992). *The Lever of Riches*. New York: Oxford University Press. pp. 209-238.

- Adas, M. (1989). *Machines as the Measure of Man*. Ithaca, NY: Cornell University Press. pp. 1-16, 402-418.
- Gargeyas, A. 2021. China's 'Standards 2035' Project could result in a technological Cold War. *Diplomat* (September 18) <https://thediplomat.com/2021/09/chinas-standards-2035-project-could-result-in-a-technological-cold-war/>

Monday, November 20 – Environment, Community, and Technology (in-person)

- Fiske, A. (2018). Dirty hands: The toxic politics of denunciation. *Social Studies of Science*, 48(3), 389 – 413
- Liboiron, M., Tironi, M., & Calvillo, N. (2018). Toxic politics: Acting in a permanently polluted world. *Social Studies of Science*, 48(3), 331-349.
- North, J. 2021. Is Chevron's vendetta against Steven Donziger finally backfiring? *The Nation* (October 4) <https://www.thenation.com/article/environment/steven-donziger-chevron-sentencing/>

Wednesday, November 22 – Effects of the Digital Technologies (Draft of your paper due, no class, but you are responsible for the readings)

- Silva, S., & Kenney, M. (2019). Algorithms, platforms, and ethnic bias. *Communications of the ACM*, 62(11), 37-39.
- Marche, J. 2012. Is Facebook making us lonely? (May) <https://www.theatlantic.com/magazine/archive/2012/05/is-facebook-making-us-lonely/308930/>
- Klinenberg, R. 2012. Facebook isn't making us lonely. *Slate* (April 19) <https://slate.com/human-interest/2012/04/is-facebook-making-us-lonely-no-the-atlantic-cover-story-is-wrong.html>
- West, J. (2016). Microsoft's disastrous Tay experiment shows the hidden dangers of AI. Retrieved September 13, 2016, from <https://qz.com/653084/microsofts-disastrous-tay-experiment-shows-the-hidden-dangers-of-ai/>
- IBM researcher feeds Watson supercomputer the 'Urban Dictionary': Very quickly regrets it. (2013). Retrieved September 13, 2016, from <https://www.techdirt.com/articles/20130110/14542221635/ibm-researcher-feeds-watson-supercomputer-urban-dictionary-very-quickly-regrets-it.shtml>

Monday, November 27 – Online Platforms (in-person)

Required:

- Gillespie, T. (2010). The politics of 'platforms'. *New Media & Society*, 12(3), 347-364.
- Scott, S. V., & Orlikowski, W. J. (2012). Reconfiguring relations of accountability: Materialization of social media in the travel sector. *Accounting, Organizations and Society*, 37(1), 26-40.

Optional:

- Niederer, S., & Van Dijck, J. (2010). Wisdom of the crowd or technicity of content? Wikipedia as a sociotechnical system. *New Media & Society*, 12(8), 1368-1387.

Wednesday, November 29 – Technology in Sport (Draft returned with comments)

- Hilvoorde, I. (2007). Flopping, klapping and gene doping: Dichotomies between 'natural' and 'artificial' in elite sport. *Social Studies of Science*. 37: 2 pp. 173-200.

- Downey, G. (2007). Producing pain: Techniques and technologies in no-holds-barred fighting. *Social Studies of Science*. 37. Pp.201-226.
- Barratt, P. (2012). 'My magic cam': A more-than-representational account of the climbing assemblage. *Area*, 44(1), 46-53.

Monday, December 4 – Technology and Food (in-person)

Required:

- Jönsson, E. (2016). Benevolent technotopias and hitherto unimaginable meats: Tracing the promises of in vitro meat. *Social Studies of Science*, 46(5), 725-748.
- Pollan, M. (2020). The sickness in our food supply chain. *New York Review of Books* (June 11).

Optional:

- Josephson, P. (2008). The Ocean's Hot Dog: The Development of the Fish Stick. *Technology and Culture* 49:1. Pp. 41-61.

Wednesday, December 6 – STUDENT PRESENTATIONS/QUIZ CURVE DISCUSSED

Paper due the day and time of the final