HPSC0037

Thinking about Technology

Course Syllabus

Course Information

An introduction to ways of thinking about technology, from historical, sociological and philosophical perspectives. The course starts with lectures and seminars on fundamental questions: what is technology? Is technology socially shaped? Do artefacts have politics? What are the common mistakes in thinking about technology? The course then addresses major ket historical developments (industrialization, growth of technological systems, the spread of information technologies, the influence in the current era of Big Tech giants), as well as key issues (disability) and questions (can machines think? can machines be ethical?), and critical philosophical approaches.

Basic course information

Course website:	See moodle
Moodle Web site:	https://moodle.ucl.ac.uk/course/view.php?id=7442
Assessment:	Essay
Timetable:	www.ucl.ac.uk/sts/hpsc
Prerequisites:	No prerequisites
Required texts:	No required texts
Course tutor(s):	Professor Jon Agar
Contact:	jonathan.agar@ucl.ac.uk
Web:	https://www.ucl.ac.uk/sts/people/professor-jon-agar
Office location:	22 Gordon Square, Room 2.4a
Office hours:	TBC

Aims & objectives

Aim. The aim of the module is to provide students with the knowledge of the ways of thinking about technology, philosophical, sociological and historical.

Objectives. By the end of this module students should be able to:

- Apply knowledge of ways of thinking about technology, philosophical, sociological and historical.
- Possess skills for interpreting technology in the modern world

Schedule

UCL Week	Topic	Date	Activity
6	1. What is technology?	6.10	READ: Winner
7	2. Sociology of technology	13.10	READ: MacKenzie and Wajcman READ: Pinch and Bijker
8	3. Common mistakes in thinking about technology	20.10	READ: Edgerton READ: Verrips and Meyer
9	4. Industrial Revolutions in Work and at Home	27.10	READ: Cowan
10	5. Growth of Technological Systems Advice on Essays	3.11	READ: Hughes
11	READING WEEK		
12	6. What's a Computer?	17.11	READ: Abbate
13	7. Big Tech	24.11	READ: David READ: Zuboff
14	8. Disability	1.12	READ: Jain
15	9. Can machines think? Can machines be ethical?	8.12	READ: Turing READ: Suchman and Sharkey
16	10. Critical Philosophy of Technology	15.12	READ: Heidegger
	Submit Essay		Submit essay

Assessments

Summary

	Description	Deadline	Word limit
100%	Essay	10 January 2022	3000* (*for iBSc students – Level 6 – TBC)

Assignments

Essay: Describe and analyse a technology or technological system, drawing on ways of thinking about technology encountered in the course

Suggested approach:
1) Choose your technology or technological system. Often more specific choices make for stronger essays than more general ones. So, for example, the 'Model T Ford automobile' is a better choice than 'cars'. Surprising or unusual choices also often make better essays.
2) Choose early so you can accumulate sources and evidence over the term. Start and maintain a project file where you keep useful sources, references, pictures, ideas, and so on. The dossier will be a record of your exploration of the social and cultural life of the object you have chosen.
   A good file might have the following components, or respond to the following questions:
   - Record observations of how people interact with the technology you have chosen. How is it used? Is it changed in use? How does the technology affect people, and vice versa? What sorts of people interact with it? What do people say about it? What meanings does the technology hold and for whom?
   - What can be found out about the history of the technology? Where was it developed, produced, sold? Who made it? Under what conditions? Who maintained it?
   - At what scales is the technology significant? Is it part of a system?
   - Build up a visual record: drawings, photographs. Make notes on what these visual clues reveal.
   - Is your technology on display at the Science Museum? If so what interpretation is given?
3) Reflect on which ways of thinking about technology (especially arguments and ideas from class readings) might help in interpreting your technology in context
4) Draft and write your essay. Feel free to use your visual record where pictures help your argument. The essay will integrate your case study with methodological perspectives and empirical comparisons drawn from the course readings.

Essays must be submitted via Moodle

Criteria for assessment

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook. The general criteria for assessment for STS BSc coursework can be found here: http://www.ucl.ac.uk/sts/study/bsc/documents/criteria_for_assessment_general_.pdf

Specific guidelines

The following is some informal, specific guidelines regarding the essay coursework for HPSC0037. The essay project itself is defined above.

The essay will be marked with reference to three categories (you will see these in the general comments section on Turnitin): structure, content and style. All three are important, but most of the credit will concern content. The following breaks down what I am looking for under each of these headings. Overall, the essay will be graded according to whether it is judged to meet these descriptions of qualities in ways which are excellent (>70%), good (60-69%), satisfactory (50-59%), poor (40-49%) or have failed (0-39%).

Structure

- The essay has a clear (1) **introduction**, mains sections organised by (2) **literature review**, (3) **methodology**, (4**) case study**, and a clear (6) **conclusion**.
- The essay has a complete and accurate bibliography.

Content

- The (2**) literature review** is a survey and summary of the secondary academic literature relating to the class of the technology you have chosen (eg if you have chosen the 'Model T Ford car' then survey and summarise he secondary academic literature on automobiles and mass production. Also identify and describe, with references, anything about the broader context (social, political, cultural) necessary to understand the technology or the argument you will be making.
- The (3) **methodology** is an account of which analytical tools, including some from class readings, you will be using, and why. The account of the technological object or system is analysed by drawing on one or more (probably more) of the ways of thinking about technology we have read and discussed in class. If these frameworks are supplemented by others we have not directly discussed in class, then these are described, assessed and applied accurately and convincingly.
- The (4) **case study** is a detailed description of the technology you have chosen. How does it work? How has it developed over time? What are the relevant social groups or individuals (some, possibly all of the following: users, retailers, manufacturers, designers, inventors, etc), and what are the tensions or connections between them?
- The (5) **analysis** is the section in which you show what insights are generated by applying the analytical tools to the case study. The analysis is persuasive.

- The accounts above are referenced to sources, especially academic scholarship. The essay should reflect them accurately, and should be examined critically. No essay will be overly dependent on a handful of sources.
- Again these analytical sources should be treated critically: what are their strengths and weaknesses? What are the assumptions or the alternatives? Should the way of thinking about technology be modified by what you have found out?
- Does the essay offer some independent critique or insight or does it merely report what is in the literature? This criterion becomes increasingly more important for higher level history essays, and for the 'originality' mentioned in the general criteria.

Style

- We place great emphasis on clarity of argument and expression. Avoid ambiguity, vagueness and the passive voice where possible. Try to keep your line of argument clear. Clarity is one reason to divide the main body of the essay into sections.
- Format (including referencing) is clear and consistent

Further advice on sources

Any source is of potential use so long as you consider them critically and you provide a full and proper reference. However, academic studies of technology are often the strongest sources. To find their work you can:

- Browse the relevant section in the UCL Science Library (3rd floor, amongst the STS books). Other good locations are Senate House library (which is comprehensive), and the Science Museum's Dana Research Library (next to the Science Museum) which has a specialist library on technology you can use – most of the books you would need all in one place.
- Search relevant journals. Good history of technology journals include: *Technology & Culture* and *History and Technology*. Other STS journals that include papers on technology include: *Science, Technology and Human Values* and *Social Studies of Science*.
- But there are plenty of other academic journals from outside STS (eg geography, politics, philosophy, etc) that may have relevant scholarship.
- Try scholar.google.com searches. Use google scholar both to find likely literature on your topic, but also by seeing who cites a central piece, where later literature on the topic can be found
- Visual illustrations can help, but make sure they are a) part of your argument, and not merely decorative, and b) referenced accurately and properly
- Your own observations or visual recordings may well be valuable. These can be referenced by place, date, and your own authorship.

Reading list

Class 1 <u>What is Technology?</u>   **6 October 2021**

What is technology – tools – artefacts – systems – technical knowledge – know-how – relationship with science – relationship to society, economy, culture

Essential reading: Langdon Winner, 'Do artifacts have politics?', in *The Whale and the Reactor: a Search for Limits in an Age of High Technology*, Chicago, University of Chicago Press, pp.19-39. Also reprinted in MacKenzie and Wajcman (1985)

Optional further reading: Eric Schatzberg, *Technology: Critical History of a Concept*, Chicago: University of Chicago Press, 2018

Class 2 <u>Sociology of Technology</u>   **6 October 2017**

In what ways do technologies shape society – weak and strong forms of shaping– technological determinism - social shaping of technology - SCOT – sociology of science and sociology of technology – critiques of SCOT

Essential reading: Donald MacKenzie and Judy Wacjman, 'Introductory essay', in Donald MacKenzie and Judy Wacjman, *The Social Shaping of Technology* (Open University Press, 1985), pp2-25. Trevor J. Pinch and Wiebe E. Bijker, 'The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other', in Bijker, Pinch and Hughes (eds.), *The Social Construction of Technological Systems*, Cambridge, MA: MIT Press, 1987, pp.17-50

Optional further reading: (1) Langdon Winner, 'Upon opening the black box and finding it empty: social constructivism and the philosophy of technology', *Science, Technology, & Human Values* (1993) 18, pp. 362-378. http://journals.sagepub.com/doi/pdf/10.1177/016224399301800306 (2) Steve Woolgar, 'The turn to technology in social studies of science', *Science, Technology & Human Values* (1991) 16(1), pp. 20-50 https://doi.org/10.1177/016224399101600102 (This paper is also a critique of Winner's 'Artefacts')

Class 3 <u>Common Mistakes in Thinking about Technology</u>   **20 October 2021**

Technologies in use - distinguishing technology from innovation – revisiting technological determinism – technology in developed and developing world – importance of old technologies

Essential reading: David Edgerton, 'From innovation to use: ten eclectic theses on the historiography of technology', *History & Technology* (1999) 16, pp.111-136. Jojada Verrips and Birgit Meyer, 'Kwaku's car: the struggles and stories of a Ghanaian long-distance taxi-driver', in Daniel Miller (ed.), Car Cultures, Oxford: Berg, 2001, pp.153-184

Optional further reading: David Edgerton, *The Shock of the Old: Technology and Global History since 1900*, London: Profile, 2006.

Class 4 <u>Industrial Revolution in Work and at Home</u>   **27 October 2021**

Adam Smith on the division of labour – industrial revolution – clocks, time and work discipline – Ford and Fordism – artisan skill and deskilling - Gender as a factor in the social shaping of technology – domestic technologies – industrialization of the home

<u>Essential reading</u>: Ruth Schwartz Cowan, 'The "industrial revolution" in the home: household technology and social change in the 20th Century', *Technology and Culture* (1976) 17, pp. 1-23 https://www.jstor.org/stable/3103251

<u>Optional further reading</u>: E.P. Thompson, 'Time, work-discipline and industrial capitalism', *Past and Present* 38 (1967), pp56-97. David Hounshell, *From the American System to Mass Production, 1800-1932: the Development of Manufacturing Technology in the United States*, Baltimore: Johns Hopkins University Press, 1984. Judy Wajcman, *Feminism Confronts Technology*, Cambridge: Polity Press, 1991. Barbara Hahn, *Technology and the Industrial Revolution*, Cambridge: Cambridge University Press, 2020.

Class 5 <u>Growth of Technological Systems</u>   **3 November 2021**

Technological systems – Hughes's model of growth of systems – Edison as systems builder Railways – perception of time and space – corporations - infrastructures

<u>Essential reading</u>: Thomas P. Hughes, "The Evolution of Large Technological Systems," in Bijker, Hughes, and Pinch (eds.), *The Social Construction of Large Technological Systems*, Cambridge, MA: MIT Press, pp.51-82

<u>Optional further reading</u>: Wolfgang Schivelbusch, *The Railway Journey: the Industrialization and Perception of Time and Space in the 19th Century*, Leamington Spa: Berg, 1986. Alfred D. Chandler, Jr., *The Visible Hand: the Managerial Revolution in American Business*, Cambridge, MA: Belknap Press, 1977. Brian Larkin, 'The Politics and Poetics of Infrastructure', *Annual Review of Anthropology* (2013), 42, pp. 327-343 https://doi.org/10.1146/annurev-anthro-092412-155522

<u>NOTE</u>: Advice on coursework essays will also be provided in this session

READING WEEK

Class 6 What's a Computer?   **17 November 2021**

Long history of information technologies – crises of industrial control – universal machine – stored-program electronic computers – business or military? - miniaturization - networks

<u>Essental reading</u>: Janet Abbate, 'Cold war and white heat: The origins and meanings of packet switching', Chapter 25 in MacKenzie and Wajcman, second edition, *Social Shaping of Technology* https://eecs.wsu.edu/~taylorm/2012_VAST/Abbate.Cold.War.and.White.Heat.Packet.Switching.pdf

<u>Optional further reading</u>: Martin Campbell-Kelly and William Aspray, *Computer: a History of the Information Machine*, New York: Basic Books, 1996 (later editions available, full text via UCL Explore). Paul Edwards, *The Closed World: Computers and the Politics of Discourse in the Cold War*, Cambridge, MA: MIT Press, 1996 http://cognet.mit.edu/book/closed-world

Class 7 Big Tech   **24 November 2021**

Big Tech Giants (including Facebook and Google) – social media – attention economy – politics of bubbles - lock-in – surveillance capitalism

Essential reading: Paul David 'Clio and the economics of QWERTY', *American Economic Review* (1985) 75(2), pp.332-337 Shoshana Zuboff, 'Big other: surveillance capitalism and the prospects of an information civilization', *Journal of Information Technology* (2015) 30, pp. 75–89

Optional further reading: John Lanchester, 'The global id', *London Review of Books* (2006) https://www.lrb.co.uk/v28/n02/john-lanchester/the-global-id. Tarleton Gillespie, 'The politics of "platforms"', *New Media & Society* (2010) 12(3), pp. 347–364. Richard Barbrook and Any Cameron, 'The California ideology' (1995/6), various versions, including https://www.tandfonline.com/doi/pdf/10.1080/09505439609526455

Class 8   Disability   **1 December 2021**

Functionality in definitions of technology – prosthetics – technology and Deaf culture – technology and cultural diversity/uniformity

Essential reading: Sara S. Jain, 'The Prosthetic Imagination: Enabling and Disabling the Prosthesis Trope', *Science, Technology, & Human Values* (1999) 24, pp. 31-54. https://doi.org/10.1177/016224399902400103

Optional further reading: David E. Nye, 'Chapter 5: Cultural uniformity, or diversity?', in *Technology Matters: Questions to Live with*, Cambridge MA: MIT Press, 2006, pp.67-86. Bess Williamson, 'Electric Moms and Quad Drivers: People with Disabilities Buying, Making, and Using Technology in Postwar America', *American Studies* 52 (2012), pp 5-29 https://www.jstor.org/stable/41809566 Vasilis Galis, 'Enacting disability: how can science and technology studies inform disability studies?', *Disability & Society* (2011) 26, pp. 825-838. https://doi.org/10.1080/09687599.2011.618737. Myriam Winance 'Trying Out the Wheelchair: The Mutual Shaping of People and Devices through Adjustment', *Science, Technology, & Human Values* (2006) 31, pp.52-72. https://journals.sagepub.com/doi/10.1177/0162243905280023

Class 9 Can machines think? Can machines be ethical?   **8 December 2021**

Artificial intelligence – Turing – ethics in machines

Essential reading: Alan Turing, 'Computing machinery and intelligence', *Mind* (1950) 59, pp. 433-460. Lucy Suchman and Noel Sharkey, 'Wishful Mnemonics and Autonomous Killing Machines', *AISB Quarterly* (2013), pp. 14-22.

Optional further reading: Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, 'Machine Bias: there's software used across the country to predict future criminals. And it's biased against blacks', *ProPublica*, May 2016 https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Class 10 Critical Philosophy of Technology   **15 December 2021**

Marx – Heidegger – Ellul - Haraway

Essential reading: Martin Heidegger, 'The question concerning technology', reprinted in Robert C. Scharff and Val Dusek (eds.), *Philosophy of Technology: the Technological Condition. An Anthology*, Oxford: Blackwell, 2003, pp. 252-264.

Optional further reading: Extracts from Karl Marx, *Capital*, *A Contribution to the Critique of Political Economy*, Marx and Engels, *The German Ideology*, and Engels, *Dialectics of Nature*, and Marx and Engels, Basic Writings on Politics and Philosophy, in Robert C. Scharff and Val Dusek (eds.), *Philosophy of Technology: the Technological Condition.* An Anthology, Oxford: Blackwell, 2003, pp. 66-79. Donald MacKenzie, 'Marx and the machine', Technology and Culture (1984) 25, pp. 473-502 http://www.jstor.org/stable/3104202. Jacques Ellul, *The Technological Society*, New York: Knopf, 1964. Donna Haraway, 'A manifesto for cyborgs: science, technology, and socialist feminism in the 1980s', *Australian Feminist Studies* (1987) 2(4), pp. 1-42 http://dx.doi.org/10.1080/08164649.1987.9961538 Andrew Feenberg, 'Critical theory of technology: an overview', https://www.sfu.ca/~andrewf/books/critbio.pdf

Course expectations

Students are expected to have read and to have made notes on the readings required for each class. Students are expected to contribute to discussions in class.

Important policy information

Details of college and departmental policies relating to modules and assessments can be found in the STS Student Handbook www.ucl.ac.uk/sts/handbook

All students taking modules in the STS department are expected to read these policies.