

Nanyang Technological University
HH2017: History of information technology
Semester 1, 2019-20

Final Version

Academic Units: 3
Pre-requisites: None
Instructor: Associate Professor Hallam Stevens
Email: hstevens@ntu.edu.sg
Office: HSS-05-07

Overview

The History of Information Technology surveys the history of computers and other information technologies from the nineteenth century to the present. Content will include nineteenth century “information technologies” such as Babbage’s engines and the telegraph, the invention of the electronic computer, the emergence of networking, the rise of the personal computer, the growth of the World Wide Web, as well as recent trends in computing and information technology such as social networking and cloud computing.

Logistics

This is a lecture & tutorial class. Lectures and tutorials will take place on Monday afternoons. Lectures will be held in **LT-17 from 1.30-3.30pm** and tutorials slots are designated as **3.30-4.30pm (T1) and 4.30-5.30pm (T2), both to be held in TR+34.**

Learning Objectives

- Understand the origins of modern computers;
- Understand the role of information technology in society and its impact on society;
- Theorize the relationship between technology and society;
- Place contemporary developments in information technology in historical context;

Some important things to know for this module:

Readings

All the readings for the class will be placed online on Blackboard/NTU Learn, downloadable for your reading pleasure. Completing the assigned reading for the week before the lecture and tutorial is a minimum expectation for class participation.

There is no textbook for the class. However, if you do want an overview of some of the material in the course, there are several books I would suggest:

- Paul Ceruzzi (2003) *A History of Modern Computing* (MIT Press)

- Paul Ceruzzi (2012) *Computing: A Concise History* (MIT Press) [more or less a compressed version of the above]
- Martin Campbell-Kelly and William Aspray (2004) *Computer: A History of the Information Machine* (Westview Press)
- Janet Abbate (1999) *Inventing the Internet* (MIT Press)
- Ask me if you want more information / reading on specific topics.

MCs

Medical certificates are not a “get out of jail free” card. Missing a tutorial or lecture without an MC will mean an automatic zero for any attendance and participation marks awarded for that week. Presenting an MC allows you the *opportunity* to make up the grade for your missed class, but it does not automatically make up for the missed class. Usually, this means I will ask you to write a 500-word response paper on the readings for that week. The grade on this response paper will make up your attendance and participation grade for that week.

Academic honesty

The University rules regarding plagiarism will be strictly enforced in this class. Make yourself familiar with the rules. Even when you are creating a multi-website, you should acknowledge your sources either via links, linked footnotes, or a “sources” page. If in doubt, ask me.

Practice-based tutorials

Some of the tutorials in this class (weeks 3, 5, 9, 11, and 13) are designated as “practice-based.” In these tutorials you will have to work “hands-on” with computer hardware or software during tutorials. They are described in more detail in the “week-by-week” section of the syllabus below (see notes marked with “@” symbol). For each of these weeks, you will have to write up a reflection online that will be graded and count as part of your “practice-based” assessment (see “assessment” section below).

Extensions and late work

Any late work will lose marks at the rate of 10% of the maximum grade per 24-hour period or part thereof [for example, late 1 hour = 10% penalty, late 26 hours = 20% penalty, late 71 hours = 30% penalty]. Extensions for assignments will be considered on a case-by-case basis in extraordinary circumstances. No extensions will be granted within one week of the deadline.

Assessment

This class has no final examination. The assessment tasks aim to develop your skills as historians and to ask you to read and think critically about history. The assessment structure will reward those students who work consistently over the course of the semester.

Practice-based assessment (20%):

This component will be made up of online activities and exercises based on the practice-based tutorials. These will be completed online and graded on a week-to-week basis. No particular exercise from any week will count for more than 5% of your total grade. See activities marked with an “@” symbol below.

Presentation (25%):

Pick a specific computer or device, tells us about its history and how it works. A list of devices will be provided (look for the “#” symbol in the week-by-week description of the class below). You will work in groups to present your findings during lecture time. The size of the groups will be determined in the first or second week of class based on the overall class size.

Midterm Test (25%)

This will be held during class time in **Week 7**. It will be based on “identities” from the readings and lecture materials (you will be asked to identify and comment on a person, place, or thing).

Test date: Monday 23rd September [in class]

Multi-Media Report (30%)

This will be due at the end of the semester. It will comprise a research report based on the historical development of a particular technology. The content will must be *diachronic* (that is, track development over time). You will present your findings as a multi-media website – it should include not only texts, but videos, pictures, infographics, etc. The textual parts of the report will also be submitted to Turn-It-In.

Due date: Friday 15th November, 5pm (online and text via Turn-It-In).

Module Outline and Readings*Week 1 (August 12th): No class meeting, Hari Raya Haji*

- Watch introductory lecture online via LAMS sequence (“Content → Assignments → week 1”) and complete the mini-quiz.

@Practice-based: you will be required to watch the video and complete a short introductory quiz for the course. This will count towards your practicum grade. (Deadline: 5pm Friday 23rd August)

Week 2 (August 19th): Computing in the nineteenth century

- Bruce Collier and James MacLachlan (2000) *Charles Babbage: And The Engines of Perfection*. [“The Making of a Mathematician”, “Inventing the Difference Engine”, Reform is in the Air”, pp. 8-19, 35-72]
- Charles Babbage (1835) *On the Economy of Machinery and Manufactures*. [Preface, Introduction, Chapters 18 and 19]

Week 3 (August 26th): When computers were humans

- Andrew Hodges (1992) “The Relay Race” in *Alan Turing: The Enigma* (Vintage): 160-241.

@Practice-based: Calculating with adding machines (Deadline: 5pm Friday 30st August).

#Differential Analyzer (Vannevar Bush); #Hollerith Machine

Week 4 (September 2nd): World War II

- Aiken Computer Laboratory (1985) *A Manual Operation for the Automatic Sequence Controlled Calculator*, Charles Babbage Institute reprint series for the History of Computing, vol. 8 (Cambridge, MA: MIT Press): 1-52 [you don't need to read this in detail and understand it; just try to use it to get a sense of how this computer might have worked]
- Martin Campbell-Kelly and William Aspray (2004) “Inventing the Computer” in *Computer: A History of the Information Machine* (Westview Press): 79-104.

#Colossus; #Z1; #Atanasoff-Berry; #Harvard Mark I; #ENIAC; #Manchester “baby”

Week 5 (September 9th): Brains and mainframes

- John von Neumann (1945) ‘First Draft of a Report on the EDVAC’ Michael D. Godfrey, ed.
- Pamela McCorduck (2004) *Machines who think*. A.K. Peters. [“Meat machines” and “The information processing model”, pp. 85-110]

@Practice-based: Psychotherapy with Eliza (Deadline: 5pm Friday 13th September)

#EDVAC; #UNIVAC; #IBM 701; #Ferranti Mark I; #Whirlwind

Week 6 (September 16th): The Transistor and the Integrated Circuit

- Nick Holonyak (1992) “John Bardeen and the Point-Contact Transistor” *Physics today* 45 (April): 36-43.
- Christophe Lécuyer (2006) “Revolution in Silicon” in *Making Silicon Valley: Innovation and the growth of high tech, 1930-1970* (Cambridge, MA: MIT Press): 129-167.

#Busicom calculator; #Intel 4004

Week 7 (September 23rd): Midterm Test

We will have the midterm test during the first hour of the lecture time. No tutorials this week.

Mid-Semester Break

Week 8 (October 7th): ARPA and the First Networks

- Janet Abbate (1999) *Inventing the Internet* (MIT Press) [“Building the ARPANET: challenges and strategies”, pp. 43-82]
- M. Mitchell Waldrop (2002) *The Dream Machine: J.C.R. Licklider and the revolution that made computing personal* [“The intergalactic network” pp. 259-332]
- Fred Turner (2006). “The Shifting Politics of the Computational Metaphor” in *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*, pp. 11-39. Chicago, IL: University of Chicago Press.

#DEC-PDP-1; #LINC; #IBM 360

Week 9 (October 14th): Personal Computers

- Ted Nelson (1977) *The Home Computer Revolution* (Published by the author): 10-31.
- Paul Freiberger and Michael Swaine (2000) ‘Homebrew’ in *Fire in the valley: the making of the personal computer* 2nd ed. (New York: McGraw-Hill): 109-136.
- Walter Isaacson (2011) *Steve Jobs* (Simon & Schuster) [Chapter 2-5, pp. 21-70]

@Practice-based: Working with the Altair 8800 simulator (Deadline: 5pm Friday 18th October)

#Apple I; #Apple II; #Commodore PET; #Commodore 64; #Commodore Amiga

Week 10 (October 21st): Users

- Ian Hardy (1996) “The Evolution of ARPANET Email” Honors thesis, Department of History, University of California Berkeley.
- Michael Hauben, Ronda Hauben, and Thomas Truscott (1997). “The Social Forces Behind the Development of Usenet,” pp. 48-58 in *Netizens: on the history and impact of Usenet and the Internet*. Wiley-IEEE Computer Society.
- Joy Lisi Rankin (2018) “Back to BASICS” in *A People’s History of Computing in the United States*. Harvard University Press. pp. 66-105.

#Modem; #Fibre Optics; #Usenet; #Telenet; #NSFNET; #Compuserve

Week 11 (October 28th): No class meeting due to Deepavali holiday

@Practice-based: Playing games on early PCs [online only; no lecture or tutorial]

Week 12 (November 4th): World Wide Web

- Tim Berners-Lee (1989) “Information management: a proposal” Available at: <http://www.w3.org/History/1989/proposal.html>
- Paul Ceruzzi (2012) *Computing: A Concise History* (MIT Press) [“The Internet and the World Wide Web”, pp. 121-154]

#NEXT; #Mozilla; #Netspace; #HTML

Week 13 (November 11th): IT hardware in China: outsourcing and its consequences

- Boy Lüthje, Stephanie Hürtgen, Peter Pawlicki, and Martina Sproll (2013) “Beyond the New Economy: The global restructuring of production models in the IT industry.” In: *From Silicon Valley to Shenzhen: global production and work in the IT industry*. Rowman and Littlefield, pp. 33-68.
- Hallam Stevens (2019) “The quotidian labor of high-tech: innovation and ordinary work in Shenzhen” *Science, Technology & Society* 19, no. 2.

@Practice-based: Copycat electronics (Deadline: 5pm Friday 15th November)

#dual-sim mobile phone; #Ren Zhengfei; #BYD; #QQ;