Nanyang Technological University
HD0101: Digital Society
Semester 1, 2021-22

Academic Units: 3
Pre-requisites: None
Instructor: Associate Professor Hallam Stevens
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Office: SHHK 03-84d.
Virtual office hours: Online via Blackboard Collaborate on Wednesdays 4.30-5.30pm or by appointment.

Overview

The aim of this course is to provide you with an introduction to critical thinking about our digital society. Drawing from disciplines including history, sociology, philosophy, and anthropology, it will help you to understand the social, cultural, political, economic, and legal transformations and challenges that have accompanied the introduction of electronic computers, digital networks, big data, and artificial intelligence. This course will be of interest to those students who seek to understand the ethical, social, and political consequences of our information technological world.

Learning Objectives

1. **Demonstrate** knowledge of the major ethical, social, and political issues raised by digital technologies;
2. **Explain** the ways in which digital technologies have impacted our social, political, and economic life;
3. **Analyse** digital technologies using critical tools from the humanities and social sciences.

Logistics

This class will be entirely online. Each week of the class will be comprised of a **pre-recorded one-hour lecture** and **online activities** consisting of approximately two hours of work. The lectures and activities will be made available on Monday mornings of each week and remain available throughout the semester (except for week 1; due to National Day the week will begin on Tuesday 10th August). The class appears on the schedule at 7.30-8.30pm on Wednesdays. However, no class activities will take place during this time *except for the tests* which will take place in weeks 7 and 13. *Except for the tests*, you are free to complete the course activities at your own pace within each week.

To receive credit for the completion of the online activities, however, they must be completed by the Sunday prior to the commencement of the following week. There are also readings for each week of the class. It is recommended that you view the lecture and complete the readings before

attempting the online activities. In addition to the course email address above, the instructor will hold online office hours (at the times listed above) for any questions that may arise either about course logistics or course content.

Assessment

This class has weekly online activities, two online tests, and one final group video assignment.

Online activities (25%):

This component of your grade will be comprised of your timely progression through the online sequences. Each week's component is graded either complete or incomplete. Note that to receive credit you must complete the online packages by **11.59pm on the Sunday following the corresponding week.** For example, week 5's online activities must be completed by 11.59pm on Sunday 12th September (that is, just before the beginning of week 6). The only exception to this will be in weeks 1 and 2. Assignments for weeks 1, 2, and 3 will be due at the end of week 3 on 11.59pm on Sunday 29th August. Once you have completed the activity it is your responsibility to check that a "complete" grade has been recorded in the Grade Centre. We will not allow "re-takes" of the online activities after the deadline.

After these deadlines you will receive no credit for completing the online material. The detailed questions and materials within the online learning packages are *not* graded – they are intended for information and practice purposes only. However, answering these questions thoughtfully and carefully will help you on the tests.

Tests (50%):

These multiple-choice tests will take place during week 7 and week 13 of the course. Each test will be worth an equal number of points (ie. 25% each). Tested material will include **selected content** from readings, lecture, and online learning packages. More detailed information about the content to be covered on the tests is provided at the end of this document. The tests will be open book and open note. Each test will take place during a period of one hour at the dates and times specified below. There will be no exceptions, re-scheduling, or re-takes of these tests. If you miss the tests, you forfeit that portion of your grade.

Test 1 date: Wednesday 22nd September, 7.30pm-8.30pm (covering weeks 1-6 inclusive)

Test 2 date: Wednesday 10th November, 7.30pm-8.30pm (covering weeks 7-12 inclusive)

Group final video project (25%)

For the final project you will be randomly assigned to a group of four or five students. In the group you will work together to produce a short video (4 minutes). You will be provided with the contact information of the students in your group during week 4 of the semester. You cannot

change your group. If students in your group drop out of the class for whatever reason, your group will remain at a smaller size.

Together with your assignment submission you will have to fill in a form describing each group members' contribution to the project; this form must be signed by all the other group members. At the discretion of the instructor, students who are deemed not to have contributed significantly may be awarded only a fraction of the group's grade. You will be provided with mreo detailed information about the topics for the assignment later in the semester.

Due date: *Friday 12th November, 5.00pm.*

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.

MCs
Medical certificates are not a "get out of jail free" card. Presenting an MC allows you the *opportunity to request* an extension for completing online work, however the nature of the work to be completed and the deadline will be at the instructor's discretion.

Academic honesty
Since much of the work for this module is online there may be opportunities to cheat on tests and other assignments, particularly by sharing questions and answers with others. You are reminded of NTU's policies on academy dishonesty. If students are detected cheating on tests and assignments (for example, through suspiciously similar patterns of answers) severe grade penalties (up to and including automatic failure of the module) will apply. **Do not record the tests in any way with your phone or other device, either with photographs or videos (including screenshots); even if you have completed the test, do not share or discuss any questions or answers with others (either verbally or in written form) while the test is still ongoing; do the test alone (ideally at home or in your hall) and make reasonable efforts not to let others view your screen while you are taking the test.** Anyone caught breaking these rules will be deemed to be cheating.

Extensions and late work
There will be no extensions given for any reason for the weekly online learning packages or the tests. Plan ahead and mark the due dates in your calendar. Extensions for the final project will be considered on a case-by-case basis in extraordinary circumstances. **No extensions will be granted within one week of the deadline.**

For the online learning packages, any late work will receive a zero grade. For the final assignment, late work will lose marks at the rate of 10% (of the maximum grade) per 24-hour period of part thereof. For example, an assignment submitted from 5.01pm (1 minute past the deadline) until 5.00pm the following day will receive a 10% penalty; an assignment submitted

from 5.01pm the day after the deadline until 4.59pm two days after the deadline will receive a 20% penalty, and so on. Work that is a week late (or more) will receive a zero grade.

Technical problems
Much of this course, including its assessment, is conducted online. The course staff will do their best to ensure that the online learning packages, quizzes, and tests run smoothly. However, you are responsible for making sure that you have access to course content and tests. Complete required assignments well before their deadlines and if problems arise, alert the instructor or course staff. Computer glitches, wi-fi problems, connectivity issues, and other technical problems will generally **not** be accepted as an excuse for late or incomplete work.

Respectful behavior

We realize that at times university work can be stressful, especially when grades are at stake. However, this is no excuse for behavior that is disrespectful or discourteous. Over 1000 students will be enrolled in this course; this means that, at times, there may be delays in responding to your queries or emails. Nevertheless, the course instructor, the course staff, and the university staff will work to resolve problems in a timely and fair manner. In turn, we expect all communication, including emails and online, to remain respectful and courteous. Disrespectful behavior – either to course staff or to other students – will not be tolerated and will be reported to the appropriate Associate Chair.

Module Outline and Readings

Sub-module 1: Hardware

Week 1 (Commencing Tuesday 10ᵗʰ August): ***What is a "digital society"?***

- Primer on binary: https://learn.sparkfun.com/tutorials/binary/all

Week 2 (Commencing Monday 16ᵗʰ August): ***A short history of computing***

- Martin Campbell-Kelly et al. 2013. *Computer: a history of the information machine.* Westview Press. [Chapter 4 "Inventing the computer" (pp. 138-177) and Chapter 10 "The shaping of the personal computer" (pp. 438-483)]

Week 3 (Commencing Monday 23ʳᵈ August): ***Digital hardware***

- Nathan Ensmenger. 2018. "The environmental history of computing" Technology and Culture 59, no. 4: S7-S33.
- United Nations Environment Programme. 2019. "Technical guidelines on transboundary movement of electrical and electronic waste and used electrical and electronic equipment." 14 April.

Sub-module 2: Software

Week 4 (Commencing Monday 30th August): **What is software?**

- Mar Hicks. 2018. "When winning is losing: why the nation that invented the computer lost its lead" *Computer*. October. pp. 48-57.

Week 5 (Commencing Monday 6th September): **Software and society**

- Lawrence Lessig. 2004. *Free culture: how big media uses technology and the law to lock down culture and control creativity.* New York: Penguin. [Introduction and Chapter 1, pp. 1-30]
- Creative Commons. "About the licenses." Read this page: https://creativecommons.org/licenses/ [including all the license deeds and legal codes]

Week 6 (Commencing Monday 13th September): **Analyzing algorithms**

- FAT/ML. 2018. "Principles for accountable algorithms and a social impact statement for algorithms" https://www.fatml.org/resources/principles-for-accountable-algorithms
- Agile Alliance. 2021. https://www.agilealliance.org/agile-essentials/ [Read "Agile Essentials," "Agile 101," "Agile manifesto," and "12 principles."]

Sub-module 3: Networks

Week 7 (Commencing Monday 20th September): **Electronic communications**

- Andrew L. Russell. 2014. "The Internet's history is not as 'open' as you think" *Slate* 21 May. Available at: https://slate.com/technology/2014/05/net-neutrality-the-internet-s-history-isn-t-as-open-as-you-think.html

Test 1 this week, Wednesday 22nd September, 7.30-8.30pm.

Mid-Semester Break

Week 8 (Commencing Monday 4th October): **The Internet and its discontents**

- Chris Anderson. 2004. "The Long Tail" *Wired* 12.10.
- 2006. "Motion to quash grand jury subpoena." US District Court, Northern District of California, 1 February. Available at: http://www.dmlp.org/sites/citmedialaw.org/files/2006-02-15-Wolf's%20Motion%20to%20Quash%20Subpoena.pdf [Read pp. 1-14]

Week 9 (Commencing Monday 11th October): **Networked society**

- Lee Rainie and Barry Wellman. 2012. *Networked: The New Social Operating System.* MIT Press. [Chapter 1, "The new social operating system of networked individualism," pp. 3-20]
- Robin J. Wilson. 1996. *Introduction to graph theory.* 4th edition. [Chapters 1 and 2].

Sub-module 4: Big data

Week 10 (Commencing Monday 18ᵗʰ October): **What is big data?**

- Rob Kitchin. 2014. *The data revolution: big data, open data, data infrastructures and their consequences.* Sage. [Chapter 10 "Ethical, political, social, and legal concerns"]
- Ann Cavoukian. 2011. "Privacy by design: the seven foundational principles" https://iapp.org/media/pdf/resource_center/pbd_implement_7found_principles.pdf

Week 11 (Commencing Monday 25ᵗʰ October): **Big data and big business**

- Cathy O'Neill. 2016. *Weapons of math destruction: how big data increases inequality and threatens democracy.* Crown. [Introduction (pp. 13-37) and Chapter 5 "Civilian Casualties: justice in the age of big data" (pp. 170-208)]
- General Data Protection Regulation. https://gdpr-info.eu/ [Chapters 1, 2, and 3; read all articles 1-23]

Week 12 (Commencing Monday 1ˢᵗ November): **Big data and big government**

- Rob Kitchin. 2014. "The real-time city? Big data and smart urbanism." *GeoJournal* 79: 1-14.
- SNDGO. 2018. "Smart Nation: The Way Forward." Available at: https://www.smartnation.gov.sg/docs/default-source/default-document-library/smart-nation-strategy_nov2018.pdf

Week 13 (Commencing Monday 8ᵗʰ November): **No lecture; no online learning package.**

No reading.

Test 2 this week, Wednesday 10ᵗʰ November, 7.30-8.30pm.

Final assignment due this week, Friday 12ᵗʰ November, 5.00pm.

Specific Topics for tests

The tests will be limited to covering the following materials and topics. Any aspect of the reading, lectures, or online learning packages related to these topics is testable. Other course material outside these topics will not appear on the tests.

Midterm test:

- Binary numbers and arithmetic
- History of computers
- Standards for e-waste
- Basic coding in BASIC [extra resource to be provided]
- Copyleft / Creative Commons license terms
- Fairness, Accountability, Transparency, Ethics in algorithms
- Principles of Agile programming

Final test:

- Principles of packet switching [extra resources to be provided]
- Citizen journalism
- Network & graph theory
- Privacy by design
- Europe's General Data Protection Regulations
- Smart cities