

## CS 492: Social Implications of Computing: Fall 2022 syllabus

### 1. Contact information:

#### a. Instructor:

dan brown

David R. Cheriton School of Computer Science

Davis Centre 2516

200 University Avenue West

Waterloo, ON N2L 3G1

[dan.brown@uwaterloo.ca](mailto:dan.brown@uwaterloo.ca)

1-519-888-4567, ext. 36278

Office Hours: Tuesday 10-11 am, DC 2516

Lectures: Friday 10:30-12:20, B2-350

#### b. Teaching Assistants:

Chris Liscio ([clliscio@uwaterloo.ca](mailto:clliscio@uwaterloo.ca), office hours Thursday 10-11 am, DC 2515)

Nanda Sreenivas ([nksreeni@uwaterloo.ca](mailto:nksreeni@uwaterloo.ca), office hours Monday 1-2 pm, DC 2580)

### 2. Course description:

This course considers the impact of computing on individuals, organizations, and society. Students learn how to make informed judgements about the social and ethical consequences of deploying computing technologies and how to foster critical thought and professional responsibility.

### 3. Course goals:

At the end of the course, students should be able to

- Identify important social implications of computerization
- Describe how to behave ethically as a computer scientist
- Propose technological and social solutions to current challenges presented by computerization (recommended actions)
- Combine their opinions with information from existing research in both written and oral formats
- Collaborate with peers on open-ended topics where there is often no clear definitive response
- Formulate clear, constructive feedback on arguments constructed by their peers
- Identify where their knowledge of computer science provides a valuable contribution to the overall dialogue about the social implications of computing

### 4. Course meetings and logistics:

There will be one section of CS 492 in Fall 2022.

Class discussion will comprise a significant component of the course, so attendance at all class sessions is required unless absences are excused by the instructors in advance.

An excessive number of absences will impact the participation component of a student's

grade. Please do not attend class if you are in self-isolation; just let the instructors know you are unavailable. Class sessions will not be recorded.

My intention is to teach CS 492 largely face-to-face. The class will meet in B2-350 from 10:30 to 12:20 on Fridays. Some meetings may be on line, particularly if we have guest speakers who are not local.

5. From the news:

Most weeks, CS 492 will start with a “from the news” segment featuring a relevant article from recent news. We will supply you with the reading or video (which will be short) on the Tuesday before the course meeting. You will find it on the “from-the-news” channel on the course Slack.

Please submit articles or videos for us to consider for the “From-the-News” segment: post them in the “from-the-news” channel on the course Slack by Tuesday evening, so that we can review it. Tell us why you think it would be a good choice. Submitting articles in this way counts for the “participation” component of the course grade.

6. Course readings:

There will be no textbook for this course. All course materials are attached as links to this course syllabus, are freely available online, or (if subject to copyright protection) are available to students registered for this course via the LEARN link for the course, <https://learn.uwaterloo.ca/d2l/le/content/825721/Home>

7. Course evaluation and grading:

Evaluation in this course will include three components:

a. Writing assignments: 45%

- There will be weekly writing assignments, which will be commentaries on the readings. There will be around eleven such commentaries assigned; only the top six scores will count towards a student’s grade. Students will receive regular, written feedback on their papers from one of the teaching assistants. Commentaries will have a prompt given every week at the end of class, and online in the Slack channel. They will be due every week on Thursday at 11:59 PM via the Dropbox connected to the course via LEARN, in either .doc/.docx format or as a PDF.
- The six (6) best commentaries or position papers submitted by a student will each count for 7.5% of the student’s final grade. Therefore, the written component of the course will account for a total of 45% of a student’s final grade. Should a student wish, they may submit any commentary to an instructor by email, in an editable word-processing format (i.e., .doc or .docx) for additional feedback (beyond that received from the teaching assistant), particularly with respect to improving their writing style.
- The University of Waterloo’s Writing and Communication Centre works across all faculties to help students clarify their ideas, develop their voices, and write in the styles appropriate to their disciplines. Centre staff offer one-on-one support in planning assignments and presentation, using and documenting research, organizing and

structuring papers, and revising for clarity and coherence. We particularly encourage using the WCC for students whose English or writing skills are not at the level where they wish them to be.

- Your weekly writing assignments should be approximately two pages (1000 words) long.
- These assignments will be marked on a scale from zero to five. The weekly topic will be announced in class and will also be posted to the course webpage and the course Slack channel.

b. Class participation: 20%

- We will assess students' participation on thoughtfulness and quality, rather than quantity. What we are looking for is for students who can demonstrate meaningful engagement with the material, justify their arguments and respond respectfully to contrary positions presented by others. During the course of the semester, students are likely to be asked to advance or defend (either orally or in writing or both) positions that may differ from their own personal views.
- Suggesting articles or videos for the "From-the-News" component of the class will contribute to a student's class participation grade, as will contributing to article discussions in the course Slack channel.
- Students for whom English communication is challenging may need to work especially hard for this component of the course.

c. Group project: 35%

- There will be a small-group project that will involve a small team comprised of two to four students. Each team will submit a joint work product that may consist of a creative project, such as the development of an online program or tool, an application, a chatbot, a website, a video presentation, or a podcast.
- The group projects will involve a technological issue of the sort addressed in the course, regarding a computing topic that connects to social implications of computing. Teams will identify their topic, confirm the appropriateness of the topic with the instructors, divide the labour among their team members, and accommodate different perspectives, viewpoints, and expertise of the team members.
- If students encounter undue challenges in the project work, they should contact the instructors promptly; in particular, please do not wait until the week before the project is due to indicate that group members have been unresponsive to their assignments.
- Students may, but are not required, to prepare a short presentation to give in the final class of the semester, which will contribute to their class participation grade.
- The submission to the project consists of:
  1. A one-page description of the project, including the group members' names, what question is being addressed, what form

the project took, and summarizing the findings. This may also include a link to code repositories, or other specific items you want to have marked.

2. A five-minute video tour of the project and its findings. This should focus on results and demonstrating any system built.
3. The actual project: a usable website, a finished podcast, a functional chatbot, a playable game, or whatever the final form takes.

All of this should be submitted via the course's LEARN dropbox, with the due date of 8 December at 11:59 PM. There will be no extensions for late projects; we need to prepare for winter teaching!

This course has neither a midterm nor a final examination.

8. Rules for group work:

The project should be work only done by your group members: in particular, nothing you submit for marking should be from anyone else. You may submit other people's work that has been inspiration or that your project seeks to critique. The one exception to this rule is that you can use existing libraries or code bases, with proper acknowledgment; that said, the main intellectual contribution of your group project must be your own.

For the weekly essays, they must be entirely your own writing; you may discuss your thoughts with your classmates through the lectures and in your own conversations outside class. A good rule of thumb is that if the instructor pulls you aside and asks you to explain the arguments underlying your writing, you should be able to explain what you mean by every sentence; if not, you don't understand your own writing, which suggests that it's not sufficiently your own.

9. Marks appeals:

Should any student wish to discuss the written feedback or their mark on an individual commentary or position paper, that student should first reach out to the teaching assistant who provided the feedback or mark by email to schedule a time to discuss the comments or mark. Should the student continue to be dissatisfied with the feedback or mark provided by the teaching assistant, they should reach out to the instructor by email to schedule a time to discuss their concerns. This should be rare. Formal appeals may result in assignment of the same grade, a higher grade, or a lower grade than the previous grade awarded by the teaching assistant.

10. Course website:

The readings for CS 492 will be available via this link:

<https://cs.uwaterloo.ca/~browndg/492F22/index.shtml>; this link also includes this syllabus, and other materials.

11. Land acknowledgment:

The University of Waterloo is located on the traditional territory of the Anishinaabeg, Neutral, and Haudenosaunee people. The main campus is located on the Haldimand Tract, which was granted to the Six Nations after what I was raised to call the American Revolution. This tract includes six miles of land on either side of the Grand River. I am a non-Indigenous settler who came to this country to teach and do research, and I am

committed to incorporating Indigenous content into my teaching work. At the University of Waterloo, active work toward reconciliation takes a number of forms and is centralized within the Office of Indigenous Relations.

12. COVID continuity plan:

If the university alters the delivery structure for courses, we will respond as follows:

For cancellation of in-person classes, we will switch to Zoom-based instruction.

Students will be made aware of such arrangements via the Slack site for the course.

If the instructor takes ill, some classes may need to be delivered by teaching assistants, or via the course being taken online during the instructor's isolation period.

No specific accommodation will be made for students in self-isolation; they can connect with the instructor during office hours, and can obtain the weekly essay topic via Slack or the course webpage.

The course has neither a midterm nor a final.

13. Waterloo policies:

a. Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect, and responsibility. [Check [the Office of Academic Integrity](#) for more information.]

b. Grievance

A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

c. Discipline

A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check [the Office of Academic Integrity](#) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (*e.g.*, plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course teaching assistant(s), course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

d. Appeals

A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](#) (other than a petition) or [Policy 71, Student Discipline](#) may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to [Policy 72, Student Appeals](#).

e. Note for Students with Disabilities

[AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you

require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

f. Mental Health

If you or anyone you know experiences severe academic stress, difficult life events, or feelings of severe anxiety or depression, we strongly encourage you to seek support.

On campus resources include:

- Campus Wellness at <https://uwaterloo.ca/campus-wellness/>
- Counseling Services at counselling [services@uwaterloo.ca](mailto:services@uwaterloo.ca) / 1-519-888-4567, ext. 32655 / Needles Hall 2nd Floor (NH 2401)
- MATES one-to-one peer support program offered by WUSA and Counselling Services at [mates@uwaterloo.ca](mailto:mates@uwaterloo.ca)
- Health Services located across the creek from the Student Life Center (SLC) / 519-888-4096

Off campus resources include:

- Good2Talk (24/7) free confidential helpline for post-secondary students at 1-866-925-5454
- Here 24/7 Mental Health and Crisis Service Team at 1-844-437-3247
- OK2BME support services for gay, lesbian, bisexual, transgender, or those questioning their sexual or gender identity at 1-519-884-0000, ext. 213
- EMPOWER ME 1-833-628-5589 for Canada / U.S.A. / Other countries  
[http://studentcare.ca/rte/en/IHaveAPlan\\_WUSA\\_EmpowerMe\\_EmpowerMe](http://studentcare.ca/rte/en/IHaveAPlan_WUSA_EmpowerMe_EmpowerMe)  
EMPOWER ME in China: China North 108007142831;  
China South 108001402851

g. Diversity

It is the Faculty of Mathematics' intention that students from diverse backgrounds and perspectives be well served in its courses, and that students' learning needs be addressed both in and out of the classroom. We recognize the immense value of diversity in identities, perspectives, and contributions that students bring, and the benefit it has on the educational environment. Your suggestions are encouraged and appreciated. Please let your instructor and teaching assistant(s) know if there are ways to improve the effectiveness of this course for you personally, or for other students or student groups. In particular:

- We will gladly honour your request to address you by an alternate/preferred name or gender pronoun. Please advise us of this preference early in the semester so that we may make appropriate changes to our records;
- We will honour your religious holidays and celebrations. Please inform us of those at the start of the semester; and
- We will follow AccessAbility Services guidelines and protocols on how best to support students with different learning needs.

h. Intellectual Property: Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

14. List of readings for the course:

a. Week 1: Surveillance and anonymity

- Shoshana Zuboff, Norma Möllers, David Murakami Wood, David Lyon. "Surveillance Capitalism: an interview with Shoshana Zuboff." *Surveillance and Society*, 2019.
- Shoshana Zuboff. "Surveillance capitalism and democracy." YouTube video, 2021.
- Pia Ceres. "Kids Are Back in Classrooms and Laptops Are Still Spying on Them". *Wired*, 3 August 2022.
- Ben Burgess, Avi Ginsberg, Edward W. Felten, Shaanan Cohney. "Watching the watchers: bias and vulnerability in remote proctoring software." arXiv:2205.03009.
- Peter Steinfeld. "The deep strangeness of the Catholic Church's latest scandal." *The Atlantic*, August 2021.
- Kylie Cheung. "Abortion in the surveillance state". *Jezebel*, 21 November 2021.
- Zach Whittaker. "Amazon's Ring gave a record amount of doorbell footage to the government in 2021." *TechCrunch*, 13 July 2022.
- Jessica Lyons Hardcastle. "San Francisco cops want real-time access to private security cameras for surveillance." *The Register*, 11 July 2022.

- Amanda Holpuch. "Victory for drag queens as Facebook apologises for 'real-name' policy", *The Guardian*, 1 October 2014.
  - Sam Machkovech, "Drag queen fights back against Facebook's "real name" policy." *Ars Technica*, 12 September 2014.
- b. Week 2: Political radicalization and conspiracy theories
- Graeme Wood. "Why Tucker Carlson should want the Buffalo manifesto made public." *The Atlantic*, May 2022.
  - Jonathan Franklin. "Parts of the Buffalo shooter's alleged screed were copied from other sources." NPR, 18 May 2022.
  - Shahin Nazar and Toine Pieters, "Plandemic Revisited: A Product of Planned Disinformation Amplifying the COVID-19 'infodemic'." *Frontiers in Public Health*, 14 July 2021.
  - Poppy Noor. "Does suppressing online conspiracy theorists work? Experts weigh in." *The Guardian*, 30 July 2022.
  - Aleksandra Cichocka. "To counter conspiracy theories, boost well-being." *Nature*, 10 November 2020.
  - Sara Zeiger and Joseph Gyte. "Prevention of radicalization on social media and the Internet." *Handbook of terrorism prevention and preparedness*, 2021, chapter 12, pp. 374-411.
- c. Week 3: Democratic impacts of online discourse
- Ingmar Zahorsky. "Tor, Anonymity, and the Arab Spring: An Interview with Jacob Appelbaum." *Peace and Conflict Monitor*, 1 August 2011.
  - Nellie Bowles. "How 'Doxing' Became a Mainstream Tool in the Culture Wars." *The New York Times*, 30 August 2017.
  - Tara Burton. "Apocalypse whatever." *Real Life Magazine*, 13 December 2016.
  - Jules Evans. "The end of liberalism and the rise of network states?" Blog post on medium.com, 15 July 2022.
  - Robert Putnam. *Bowling Alone*, 2000, chapter 2.
- d. Week 4: AI creativity and co-creativity
- James Vincent. "'An engine for the imagination': the rise of AI image generators." *The Verge*, 2 August 2022.
  - Adi Robertson. "The US Copyright Office says an AI can't copyright its art." *The Verge*, 21 February 2022.
  - Dan Brown, Lauren Byl, Maura Grossman. "Are machine learning corpora 'fair dealing' under Canadian law?" *Proceedings of ICCO 2021*.
  - Benjamin Sobel, "Artificial Intelligence's Fair Use crisis." *Columbia Journal of Law and the Arts*, 2017.
  - Mike Kaput. "DALL-E 2 and the future of design." Blog post at marketinginstitute.com, 20 July 2022.
  - Khadim Shuber. "Artificial artists: when computers become creative." *Wired UK*, 8 July 2013.
  - Aaron Hertzmann, "Can computers create art?" *Arts*, 2018.

- e. Week 5: Mental health and harassment effects
- Jean Twenge. "Has the smartphone destroyed a generation?" *The Atlantic*, September 2017.
  - Brian Resnick. "Have smartphones really destroyed a generation? We don't know." *Vox*, 16 May 2019
  - Kate Julian. "Why are young people having so little sex?" *The Atlantic*, December 2018.
  - Alison Darcy *et al.* "Evidence of human-level bonds established with a digital conversational agent: cross-sectional, retrospective observational study." *JMIR Formative Research*, 2021.
  - Lydia Denworth. "What happens when kids don't see their peers for months." *The Atlantic*, June 2020.
  - Bryan Lufkin. "How online gaming has become a social lifeline." *BBC*, 15 December 2020.
  - Sakshi Venkatraman. "'Togetherness in a virtual space': LGBTQ students create community online." *NBC News*, 19 February 2021.
  - Mary Heinz. "'There's a little bit of that magic where I'm becoming something else': LGBT+ furry identity formation and belonging online." *Journal of Undergraduate Ethnography*, 2020.
- f. Week 6: Sex and love with robots
- Noel Sharkey and Amanda Sharkey. "The crying shame of robot nannies: an ethical appraisal." *Interaction Studies*, 2010.
  - Laura Bates. "The trouble with sex robots." *The New York Times*, 17 July 2017.
  - David Levy. "Sex with robots: yes!" IdeaCity conference video presentation, 2016.
  - Kathleen Richardson. "Sex with robots: no!" IdeaCity conference video presentation, 2016.
  - Richard Morgan. "Can anything stop deepfake porn?" *Morning Brew*, 29 July 2022.
  - Caitlin Chin and Mishaela Robison. "How AI bots and voice assistants reinforce gender bias." *Brookings Institution whitepaper*, 23 November 2020.
- g. Week 7: Self-driving cars and the decline of work
- Anne Balay. *Semi queer: inside the world of gay, trans and black truck drivers*, 2018, pp. 178-188.
  - Janet Fleetwood. "Public health, ethics, and autonomous vehicles." *American Journal of Public Health*, 2017.
  - Mike Monteiro. *Ruined by design*, 2019, pp. 41-52. (Available online as a sample chapter of the book)
  - Bobby Allyn. "Google Workers Speak Out About Why They Formed A Union: 'To Protect Ourselves.'" *NPR*, 8 January 2021.

- Megan McArdle. “Yes, Google has a monopoly. What’s wrong with that?” *Washington Post*, 20 October 2020.
  - Tim Brennan. “Big Tech as an Unnatural Monopoly.” *Milken Institute Review*, 8 February 2021.
  - Sara Morrison. “How much longer can Google own the Internet?” *Recode/Vox*, 20 May 2022.
- h. Week 8: computers and warfare
- Lee Gladwin. “Alan Turing, Enigma, and the breaking of German machine ciphers in World War II.” *Prologue Magazine*, Fall 1997.
  - George A. Michael, “An oral and pictorial history of large scale scientific computing as it occurred at the Lawrence Livermore National Laboratory.” Website circa 1995-2000.
  - Murtaza Hussain. “The psychological tolls and moral hazards of drone warfare.” *The Intercept*, 24 October 2021.
  - Peter Aldhous and Christopher Miller. “How open-source intelligence is helping clear the fog of war in Ukraine.” *BuzzFeed News*, 2 March 2022.
  - Johanna Bhuyian “Ukraine uses facial recognition software to identify Russian soldiers killed in combat.” *The Guardian*, 24 March 2022.
  - “Problems with autonomous weapons.” From *stopkillerrobots.org*, undated.
  - Jamie Dettmer. “Possible first use of AI-armed drones triggers alarm bells.” *Voice of America*, 7 June 2021.
- i. Week 9: Serendipity and recommendation systems
- Amanda Mull. “Fashion has abandoned human taste.” *The Atlantic*, June 2022.
  - Ted Gioia. “The new numbers on music consumption are very ugly.” *Substack newsletter*, 14 July 2022.
  - Peter Knees, Markus Schedl, Masataka Goto. “Intelligent user interfaces for music discovery.” *Proceedings of ISMIR 2019*.
  - Kyle Robinson and Dan Brown. “Quantitative user perceptions of music recommendation list diversity.” *Proceedings of ISMIR 2021*.
  - Randall Roberts. “Does Spotify pay artists a fair rate? Here’s what musicians, managers and Apple Music have to say.” *Los Angeles Times*, 19 April 2021.
- j. Week 10: Disability and the online life:
- Peter Smith and Laura Smith. “Artificial intelligence and disability: too much promise, yet too little substance?” *AI and Ethics*, 2021.
  - Ada Hoffmann. “Dark art as an access need.” *Substack newsletter*, 17 August 2021.
  - Gretel Kahn. “COVID-19 has made education more accessible for university students with mobility disabilities.” *CBC Montréal*, 3 March 2021.
  - Meredith Ringel Morris, Andrew Begel, Bein Wiedermann. “Understanding the challenges faced by neurodiverse software engineering employees: towards a more inclusive and productive technical workforce.” *Proceedings of ASSETS 2015*.

- Meg Miller and Ilaria Parogni. “The hidden image descriptions making the internet accessible.” *The New York Times*, 18 February 2022.
- k. Week 11: impacts on the developing world
- Oluwale Ojewale. “What coltan mining in the DRC costs people and the environment.” *The Conversation*, 29 May 2022
  - Amy Hawkins. “Beijing’s Big Brother tech needs African faces.” *Foreign Policy*, 24 July 2018.
  - Karen Hao. “A new vision of artificial intelligence for the people.” *MIT Technology Review*, 22 April 2022.
  - Mike Chitavi, Lauren Cohen, Spencer C. N. Hagist. “Kenya is becoming a global hub of FinTech innovation.” *Harvard Business Review*, 18 February 2021.