MIE509H1 F

AI for Social Good

Fall 2024 Syllabus

Course Meetings

MIE509H1 F

Section	Day & Time	Delivery Mode & Location
LEC0101	Tuesday, 3:00 PM - 5:00 PM Wednesday, 2:00 PM - 3:00 PM	In Person: WB 130 In Person: MY 330
TUT0101	Monday, 3:00 PM - 5:00 PM	In Person: SF 3201

Refer to ACORN for the most up-to-date information about the location of the course meetings.

Course Contacts

Course Website: https://q.utoronto.ca/courses/363647

Instructor: Prof. Mark Chignell
Email: chignell@mie.utoronto.ca
Phone: 647-389-8951
Additional Notes: The instructor will hold an evening office hour online each Tuesday at 9pm starting on September 17 and running through to December 3. There will be no office hour on October 29 (Fall Reading week). The office hour will be held on Zoom: https://utoronto.zoom.us/j/5104999442

Course Overview

The issue of design and development of AI systems that have beneficial social impact will be discussed and analyzed. The focus will not be on the mechanics of AI algorithms, but rather on the implementation of AI methods to address societal problems. Topics to be covered will include: Safeguarding of human interests (e.g., fairness, privacy) when AI methods are used; partnering of humans and AI systems to implement AI effectively; evaluation of AI assisted interventions; practical considerations in the selection of AI methods to be used in addressing societal problems. The issues that arise in implementing AI for beneficial social impact will be illustrated in a set of case studies aimed at creating beneficial social impact. Class activities will include lectures, seminars, labs, and take-home assignments.

Since topics such as AI governance are evolving rapidly, this course will emphasize key issues and tradeoffs. Tutorials will be highly interactive and students will be expect to present their ideas and critique the ideas of others.

Course Learning Outcomes

By the end of the course students should understand the threats and opportunities of AI, and key issues that need to be addressed in order to ensure that AI works in accordance with human values and goals. Students should also have a good understanding of related issues such as AI and ethics, and human-AI interaction. A key learning outcome will be understanding what AI governance frameworks and regulations are, and how they may be used to make the implementation of AI safer and more effective.

Prerequisites: MIE223, MIE237, or an Introductory Machine Learning, or equivalent
Corequisites: None
Exclusions: CSC300H1 (Computers and Society)
Recommended Preparation: None
Credit Value: 0.5

Marking Scheme

Assessment	Percent	Details	Due Date
Labs	25%	There will be five labs, each worth 5% of the grade.	2024-09-17,2024-09-24,2024-10-01,2024-10-08,2024-10-15
Project Proposal	10%	The project proposal will provide a plan for how the project will be carried out and what topics will be focused on. It will be an opportunity for TAs to provide feedback and make constructive suggestions on how to improve the project plan.	2024-10-26
Project Final Report	20%	This report will describe the work that was carried out (including methods used) the results that were obtained, and conclusions and guidelines that can be are made, based on the outcomes obtained.	2024-12-03

Assessment	Percent	Details	Due Date
Discussion/Participation	10%	Topics will be posted on the Quercus discussion board and students are expected to provide their opinions on the topics, citing evidence where appropriate. Students are encouraged to also reply to the posts of other students. Activity on the discussion board, in the labs, tutorials and lectures will all be counted in calculating the participation mark.	2024-12-03
Final Exam	35%	The final exam covers all the course material presented during the semester.	Final Exam Period

If you are going to be late submitting assigned work, ask for an extension and provide a justification.

Late Assessment Submissions Policy

10% of the assignment grade per day of lateness.

Policies & Statements

University Land Acknowledgement

I wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

Learn more about Canada's relationship with Indigenous Peoples here.

Indigenous Students' Supports

If you are an Indigenous engineering student, you are invited to join a private Discord channel to meet other Indigenous students, professors, and staff, chat about scholarships, awards, work opportunities, Indigenous-related events, and receive mentorship. Email Professor Bazylak if you are interested.

Indigenous students at U of T are also invited to visit Nations House's (FNH) Indigenous Student Services for culturally relevant programs and services. If you want more information on how to apply for Indigenous specific funding opportunities, cultural programs, traditional medicines, academic support, monthly social events or receive the weekly newsletter, go to the

FNH website, email or follow FNH on social media: Facebook, Instagram, or TikTok. A full event calendar is on the CLNX platform. Check CLNX often to see what new events are added!

Wellness and Mental Health Support

Your personal wellness and mental health are important. The University of Toronto and the Faculty of Applied Science & Engineering offer a wide range of free and confidential services that can support your well-being.

As a U of T Engineering student, you have a Departmental Undergraduate Advisor or a Departmental Graduate Administrator who can support you by advising on personal matters that impact your academics. Other resources that you may find helpful are listed on the U of T Engineering Mental Health & Wellness webpage, and a small selection are also included here:

- U of T Engineering's Student & Community Wellness Coordinator
- Health & Wellness and the On-Location Engineering Wellness Counsellor
- Health & Wellness Peer Support Program
- Accessibility Services & the On-Location Advisor
- Graduate Engineering Council of Students' Mental Wellness Commission
- SKULE™ Mental Wellness
- U of T Engineering's Learning Strategist and Centre for Learning Strategy Support
- Registrar's Office and Scholarships & Financial Aid Office & Advisor

We encourage you to access these resources as soon as you feel you need support; no issue is too small. You may reach out to the counsellors at U of T Telus Health Student Support for 24/7 free and confidential counselling support.

If you find yourself feeling distressed and in need of more immediate support visit uoft.me/feelingdistressed or U of T Engineering's Urgent Support – Talk to Someone Right Now.

Accommodations

The University of Toronto supports accommodations for students with diverse learning needs, which may be associated with mental health conditions, learning disabilities, autism spectrum, ADHD, mobility impairments, functional/fine motor impairments, concussion or head injury, visual impairments, chronic health conditions, addictions, D/deaf, deafened or hard of hearing, communication disorders and/or temporary disabilities, such as fractures and severe sprains, or recovery from an operation.

If you have a learning need requiring an accommodation the University of Toronto recommends that students register with Accessibility Services as soon as possible.

We know that many students may be hesitant to reach out to Accessibility Services for accommodations. The process of accommodation is private; we will not share details of your needs or condition with any instructor.

If you feel hesitant to register with us, we encourage you to reach out for further information and

resources on how we can support. It may feel difficult to ask for help, but it can make all the difference during your time here.

Phone: 416-978-8060
Email: accessibility.services@utoronto.ca

Equity, Diversity and Inclusion

Looking for community? Feeling isolated? Not being understood or heard?

You are not alone. You can talk to anyone in the Faculty that you feel comfortable approaching, anytime – professors, instructors, teaching assistants, first-year or upper years academic advisors, student leaders or the Assistant Dean of Diversity, Inclusion and Professionalism.

You belong here. In this class, the participation and perspectives of everyone is invited and encouraged. The broad range of identities and the intersections of those identities are valued and create an inclusive team environment that will help you achieve academic success. You can read the evidence for this approach here.

You have rights. The University Code of Student Conduct and the Ontario Human Rights Code protect you against all forms of harassment or discrimination, including but not limited to acts of racism, sexism, Islamophobia, antisemitism, homophobia, transphobia, ableism, classism and ageism. Engineering denounces unprofessionalism or intolerance in language, actions or interactions, in person or online, on- or off-campus. Engineering takes these concerns extremely seriously and you can confidentially disclose directly to the Assistant Dean for help here.

Resource List:

- Engineering Equity, Diversity & Inclusion Groups, Initiatives & Student Resources
- Engineering Positive Space Resources
- Request a religious-based accommodation here
- Email Marisa Sterling, P.Eng, the Assistant Dean, Diversity, Inclusion & Professionalism here
- Make a confidential disclosure of harassment, discrimination or unprofessionalism here or email engineering@utoronto.ca or call 416.946.3986
- Email the Engineering Society Equity & Inclusivity Director here
- U of T Equity Offices & First Nations House Resources

Cell Phones and Laptop Usage

Technology can support student learning, but it can also become a distraction. Research indicates that multi-tasking (texting, surfing the Internet, using social networks) during class time can have a negative impact on learning (Clapp, Rubens, Sabharwal & Gazzaley, 2011; Ellis, Daniels, Jauregui, 2010; Hembrooke & Gay, 2003). Out of respect for your fellow learners in this class, please refrain from using laptops or mobile phones for entertainment during class and do not display any material on a laptop which may be distracting or offensive to your fellow

students. Laptops may be used only for legitimate classroom purposes, such as taking notes, downloading course information from Portal, or working on an assigned in-class exercise. Checking social media, email, texting, games, and surfing the Web are not legitimate classroom purposes. Such inappropriate laptop and mobile phone use is distracting to those seated around you.