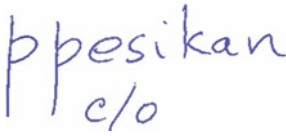


Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	AI Ethics and Data Governance
Course Code:	COMP 261
Course Hours/Credits:	42
Prerequisites:	COMP 247, COMP 254
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Mehrdad Tirandazian
Creation Date:	Winter 2022
Current Semester:	Winter 2023
Approved by:	
	<hr/> Chairperson/Dean

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Acknowledgement of Traditional Lands

Centennial is proud to be a part of a rich history of education in this province and in this city. We acknowledge that we are on the treaty lands and territory of the Mississaugas of the Credit First Nation and pay tribute to their legacy and the legacy of all First Peoples of Canada, as we strengthen ties with the communities we serve and build the future through learning and through our graduates. Today the traditional meeting place of Toronto is still home to many Indigenous People from across Turtle Island and we are grateful to have the opportunity to work in the communities that have grown in the treaty lands of the Mississaugas. We acknowledge that we are all treaty people and accept our responsibility to honor all our relations.

Course Description

This course provides an introduction to the ethics of artificial intelligence. Students will explore the ethical principles and frameworks of artificial Intelligence in various areas of life and business, and develop the abilities to analyze ethical issues, solve problems, and make informed decisions. Coursework covers basic ethics concepts, trust and fairness, responsibility and liability, business and ethical risk, psychological concepts, privacy issues, and challenges of applying AI to specific areas.

Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting <http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/>. For apprenticeship-based programs, visit <http://www.collegeoftrades.ca/training-standards>.

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Summarize the basic concepts of ethics, definitions and key words.
2. Discuss the role that trust and fairness play in the acceptance of AI systems and relate trust and fairness in AI systems to the principles of Non-maleficence, Beneficence, Autonomy, Justice and Explicability.
3. Analyze the responsibility and liability in the case of AI Systems and differentiate between moral and legal responsibility, actors and technologies involved.
4. Examine the risks in the business of AI.
5. Discuss psychological aspects of AI and how people relate to robots and autonomous systems from a psychological point of view.
6. Summarize privacy Issues of AI including how private data is systematically collected, stored and analyzed with the help of artificial intelligence and protection regulations.
7. Analyze various applications of AI and point out their ethical aspects.
8. Discuss ethical challenges confronting society as robots and artificial intelligence increasingly power the world.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
11. Take responsibility for one's own actions, decisions, and consequences.

**There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.*

Global Citizenship and Equity (GC&E) Outcomes

The student will reliably demonstrate the ability to*:

1. Identify one's roles and responsibilities as a global citizen in personal and professional life.
2. Identify beliefs, values and behaviours that form individual and community identities and the basis for respectful relationships.
4. Analyze the use of the world's resources to achieve sustainability and equitable distribution at the personal, professional, and global level.
5. Identify and challenge unjust practices in local and global systems.
6. Support personal and social responsibility initiatives at the local, national or global level.

**There are 6 institutional Global Citizenship & Equity outcomes. Of these 6 outcomes, the following will be assessed in this course.*

Text and other Instructional/Learning Materials

Text Book(s):

Christoph Bartneck, Christoph Lütge, Alan Wagner, Sean Welsh, An Introduction to Ethics in Robotics and AI, Springer 2021, available online at:

<https://link.springer.com/book/10.1007/978-3-030-51110-4>

Online Resource(s):

Internet Resources aligned with the course topics.

Material(s) required for completing this course:

Reference Books:

1. Markus Dubber, Frank Pasquale, Sunit Das, Oxford Handbook of Ethics of AI, Oxford University Press 2021.
2. Jerome Beranger, Societal Responsibility of Artificial Intelligence: Towards an Ethical and Eco-responsible AI, Willey Publication, 2021.
3. S. Matthew Liao, Ethics of Artificial Intelligence, Oxford University Press 2020.
4. Mark Coeckelbergh, AI Ethics, MIT Press, 2020.

Custom Courseware:

N.A.

Evaluation Scheme

- ⇨ Lab Assignment 1: Materials covered from Weeks 1,2,3
- ⇨ Lab Assignment 2: Materials covered from Weeks 4,5,6
- ⇨ Lab Assignment 3: Materials covered from Weeks 8,9

- ⇒ Lab Assignment 4: Materials covered from Weeks 10,11
- ⇒ Midterm Examination: Midterm examination on the materials covered from Weeks 1,2,3,4,5,6
- ⇒ Final Project Presentation: Materials covered from Weeks 1,2,3,4,5,6,7,8,9,10,11,12,13

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Lab Assignment 1	1, 2, 3	1, 2, 9, 11	1, 2, 4, 5, 6	10
Lab Assignment 2	4, 5, 6	1, 2, 9, 11	1, 2, 4, 5, 6	10
Lab Assignment 3	3, 4, 5, 7	1, 2, 9, 11	1, 2, 4, 5, 6	15
Lab Assignment 4	3, 4, 5, 7, 8	1, 2, 9, 11	1, 2, 4, 5, 6	15
Midterm Examination	1, 2, 3, 4	1, 2, 9, 11	1, 2, 4, 5, 6	25
Final Project Presentation	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 9, 11	1, 2, 4, 5, 6	25
Total				100%

If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official Centennial College photo identification or they may be refused the right to take the test or test results will be void.

Tests or assignments conducted remotely may require the use of online proctoring technology where the student's identification is verified and their activity is monitored and/or recorded, both audibly and visually through remote access to the student's computer and web camera. Students must communicate in writing to the instructor as soon as possible and prior to the test or assignment due date if they require an alternate assessment format to explore mutually agreeable alternatives.

Student Accommodation

The Centre for Accessible Learning and Counselling Services (CALCS) (<http://centennialcollege.ca/calcs>) provides programs and services which empower students in meeting their wellness goals, accommodation and disability-related needs. Our team of professional psychotherapists, social workers, educators, and staff offer brief, solution-focused psychotherapy, accommodation planning, health and wellness education, group counselling, psycho-educational workshops, adaptive technology, and peer support. Walk in for your first intake session at one of our service locations (Ashtonbee Room L1-04, Morningside Room 190, Progress Room C1-03, The Story Arts Centre Room 285, Downsview Room 105) or contact us at calcs@centennialcollege.ca, 416-289-5000 ext. 3850 to learn more about accessing CALCS services.

Use of Dictionaries

- Any dictionary (hard copy or electronic) may be used in regular class work.

Program or School Policies

N/A

Course Policies

N.A.

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic Honesty

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Forms of academic dishonesty include cheating, plagiarism, and impersonation, among others. Breaches of academic honesty may result in a failing grade on the assignment or course, suspension, or expulsion from the college. Students are bound to the College's AC100-11 Academic Honesty and Plagiarism policy.

To learn more, please visit the Libraries information page about Academic Integrity

<https://libraryguides.centennialcollege.ca/academicintegrity> and review Centennial College's Academic Honesty Module:

https://myappform.centennialcollege.ca/centennial/articulate/Centennial_College_Academic_Integrity_Module_%202/story.html

Use of Lecture/Course Materials

Materials used in Centennial College courses are subject to Intellectual Property and Copyright protection, and as such cannot be used and posted for public dissemination without prior permission from the original creator or copyright holder (e.g., student/professor/the College/or third-party source). This includes class/lecture recordings, course materials, and third-party copyright-protected materials (such as images, book chapters and articles). Copyright protections are automatic once an original work is created, and applies whether or not a copyright statement appears on the material. Students and employees are bound by College policies, including AC100-22 Intellectual Property, and SL100-02 Student Code of Conduct, and any student or employee found to be using or posting course materials or recordings for public dissemination without permission and/or inappropriately is in breach of these policies and may be sanctioned.

For more information on these and other policies, please visit www.centennialcollege.ca/about-centennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

This course outline and its associated weekly topical(s) may not be reproduced, in whole or in part, without the prior permission of Centennial College.

Semester: Winter 2023
 Section Code: ALL
 Meeting Time & Location: Wednesday - 002 - 8:30 am-11:20 am
 PR A3-17
 Friday - 001 - 3:30 pm-6:20 pm
 PR A3-15

Professor Name: Mehrdad Tirandazian
 Contact Information: mtirandazian@centennialcollege.ca

Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
1	Course Overview What is Ethics	An Introduction to Ethics in Robotics and AI Chapter 3	Explain Descriptive Ethics Differentiate between Normative Ethics and Meta-ethics, Applied Ethics Point out the Relationship Between Ethics and Law Discuss Machine Ethics	Interactive Lecture Case studies and Discussions		
2	Trust and Fairness in AI Systems	An Introduction to Ethics in Robotics and AI Chapter 4	Identify the role that trust and fairness play in the acceptance of AI systems. Relate trust and fairness in AI systems to five principles: Non-maleficence, Beneficence, Autonomy, Justice and Explicability.	Interactive Lecture Case studies and Discussions		
3	Responsibility and Liability in the Case of AI Systems	An Introduction to Ethics in Robotics and AI Chapter 5	Discuss Responsibility and Liability of AI Systems through various examples State Strict Liability and Complex Liability Explain the Consequences of Liability in AI systems	Interactive Lecture Case studies and Discussions	Assignment 1 - 10%	Week 3
4	Risks in the Business of AI	An Introduction to Ethics in Robotics and AI Chapter 6	Differentiate various AI Business risks: Functional Risk, Systemic Risk, Risk of Fraud and Safety Risk Compare various AI Ethical Risks:	Interactive Lecture Case studies and Discussions	Assignment 1 Due - 10%	Week 4

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
			Reputational Risk, Legal Risk, Environment Risk, Social Risk, Categorize the Business Ethics for the AI Companies, Formulate AI Risks to Workers			
5	Psychological Aspects of AI	An Introduction to Ethics in Robotics and AI Chapter 7	Explain the Problems of Anthropomorphisation Describe the concept of Persuasive AI Interpret Unidirectional Emotional Bonding with AI	Interactive Lecture Case studies and Discussions	Assignment 2 - 10%	Week 5
6	Privacy Issues of AI	An Introduction to Ethics in Robotics and AI Chapter 8	Define Privacy Examine Why AI Needs Data Discuss Private Data Collection and Its Dangers Classify Future Perspectives of Privacy issues	Interactive Lecture Case studies and Discussions	Assignment 2 Due - 10%	Week 6
7	Test #1	Materials Covered from weeks 1,2,3,4,5,6	N.A.	N.A.	Test #1 - 25%	Week 7
8	Application Areas of AI	An Introduction to Ethics in Robotics and AI Chapter 9	Investigate Ethical Issues Related to AI Enhancement Categorize Ethical Issues Related to Robots and Healthcare Determine the role of Robots and Telemedicine and their various applications Recognize the role AI in Education	Interactive Lecture Case studies and Discussions	Assignment 3 - 15% Project and groups formation discussion	Week 8
9	Autonomous Vehicles	An Introduction to Ethics in Robotics and AI Chapter 10	Compare various Levels of Autonomous Driving and the Current situation Distinguish Ethical Benefits of AVs	Interactive Lecture Case studies and Discussions	Assignment 3 Due - 15%	Week 9

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
10	Autonomous Vehicles	An Introduction to Ethics in Robotics and AI Chapter 10	Categorize Accidents with AVs Appraise Ethical Guidelines and Questions for AVs relating to Accountability and Liability, Privacy, Security, Appropriate Design of Human-Machine Interface, Machine Learning, etc.	Interactive Lecture Case studies and Discussions	Assignment 4 - 15%	Week 10
11	Military Uses of AI	An Introduction to Ethics in Robotics and AI Chapter 11	Discuss The Use of Autonomous Weapons Systems	Interactive Lecture Case studies and Discussions	Assignment 4 Due - 15%	Week 11
12	Military Uses of AI	An Introduction to Ethics in Robotics and AI Chapter 11	Explain Regulations Governing an AWS Express Ethical Arguments for and Against AI for Military Purposes	Interactive Lecture Case studies and Discussions		
13	Ethics in AI and Robotics: A Strategic Challenge	An Introduction to Ethics in Robotics and AI Chapter 12	Identify The Role of Ethics in AI and Robotics Interpret International Cooperation to regularize ethical AI and address its societal challenges	Interactive Lecture Case studies and Discussions		
14	Project submissions and Presentations	Weeks 1,2,3,4,5,6,7,8,9,10,11,12,13	N.A.	Project Deliverables and Presentations	Project Deliverables and Presentations - 25%	Week 14