SENATE

NOTICE OF MEETING

May 11, 2026

Please be advised that the next regular meeting of Senate of Concordia University will be held on Friday, May 15, 2026, at 2 p.m., in the Applied Science Hub Amphitheatre, 7141 Sherbrooke Street West (Room HU-125) on the Loyola Campus.

The Agenda and documents for the Open Session meeting are now posted on the Senate webpage.

Please note that Closed Session documents and discussions are confidential.

Members of the University community who wish to view the Open Session meeting are invited to go to HU-115. You will be admitted to the observers' gallery following the Closed Session meeting.

Karan Singh
Secretary of Senate

AGENDA OF THE OPEN SESSION
OF THE MEETING OF SENATE

Friday, May 15, 2026
immediately following the Closed Session meeting
in the Applied Science Hub Amphitheatre, 7141 Sherbrooke Street West
(Room HU-125) on the Loyola Campus
and via Zoom video conferencing

Item		Presenter(s)	Action
1.	Call to order	G. Carr	
	1.1 Approval of the Agenda	G. Carr	**Approval**
	1.2 Adoption of minutes from the Open Session meeting of March 27, 2026	G. Carr	**Approval**
CONSENT AGENDA			
2.	Committee reports (Document US-2026-3-D4)		**Information**
3.	Committee and Tribunal Pool appointments (Document US-2026-3-D5)		**Approval**
4.	APC recommendation:		**Approval**
	4.1 Changes to the Graduate Diploma in Chartered Professional Accountancy (Document US-2026-3-D6)		
REGULAR AGENDA			
5.	Business arising from the minutes not included on the Agenda		
6.	President's remarks	G. Carr	**Information**

7.	Academic update (Document US-2026-3-D7)	E. Diamantoudi	**Information**
8.	APC recommendations:		
8.1	New Undergraduate Microprogram in Production Accounting for Film and Television (Document US-2026-3-D8)	E. Diamantoudi/ A.-M. Croteau/ M. Tekathen	**Approval**
8.2	New Undergraduate Programs: BEng in Artificial Intelligence Engineering and BSc in Artificial Intelligence (Document US-2026-3-D9)	E. Diamantoudi/ M. Debbabi/ O. Ait Mohamed/ W. Hamou-Lhadj	**Approval**
8.3	New Undergraduate Program: Minor in Artificial Intelligence (Document US-2026-3-D10)	E. Diamantoudi/ M. Debbabi/ J. Paquet	**Approval**
8.4	New Undergraduate Microprogram in Economic Policy (Document US-2026-3-D11)	E. Diamantoudi/ P. Sicotte/ A. Noce	**Approval**
8.5	New Undergraduate Microprogram in Computational Physics (Document US-2026-3-D12)	E. Diamantoudi/ P. Sicotte/ V. Zazubovitz	**Approval**
8.6	New Undergraduate Microprogram in Religious, Cultural and Ethnic Literacy (Document US-2026-3-D13)	E. Diamantoudi/ P. Sicotte/ N. Cohn	**Approval**
8.7	New Undergraduate Microprogram in Jewish Studies (Document US-2026-3-D14)	E. Diamantoudi/ P. Sicotte/ N. Cohn	**Approval**
8.8	New Undergraduate Program: Minor in Physics (Document US-2026-3-D15)	E. Diamantoudi/ P. Sicotte/ V. Zazubovitz	**Approval**

8.9	New Undergraduate Microprogram in Songwriting and Music Production (Document US-2026-3-D16)	E. Diamantoudi/ A. Gérin	**Approval**
8.10	New Graduate Microprogram in Global Health Entrepreneurship (Document US-2026-3-D17)	E. Diamantoudi/ V. Pepin/ A. Champagne	**Approval**
9.	Approval of new programs with no resource implication (Document US-2026-3-D18)	G. Carr/ E. Diamantoudi	**Approval**
10.	Question period (*maximum 15 minutes*)		
11.	Other business		
12.	Adjournment	G. Carr	

US-2026-2

MINUTES OF THE OPEN SESSION OF THE MEETING OF SENATE

Friday, March 27, 2026 at 2:00 p.m.
in the Norman D. Hébert, LLD Meeting Room (EV 2.260)
on the SGW Campus and via Zoom video conferencing

PRESENT

Voting members:

Graham Carr (Chair)	Lina El-Bakaye	Véronique Pepin
Seif Bedair	Zoe Erika-Okoye	Isabella Providenti
Theresa Bianco	Tim Evans	Sina Queyras
Patrice Blais	Ariela Freedman	Isabelle Ranger
Onur Bodur (zoom)	Annie Gérin	Rosemary Reilly (zoom)
Narmine Boubasla	Michael Gillis (zoom)	Aphrodite Salas (zoom)
Cynthia Bruce	Steven Henle	Ramin Sedaghati
Robin Chemtov	Vanessa Massot (zoom)	Adam Semergian (zoom)
Roy Cross	Maggie McDonnell (zoom)	Anna Sheftel (zoom)
Anne-Marie Croteau	Christopher Moore	Pascale Sicotte
Fabienne Cyrius	Peter Morden	Kamila Sobol
Alexandra Dawson	Catherine Mulligan	Reza Soleymani
Mourad Debbabi	Sanaz Naghdi	Huu Thien Tran
Effrosyni Diamantoudi	Xavier Ottenwaelder	Radu Zmeureanu
Geoffrey Dover	Mireille Paquet	

Non-voting members: Philippe Beauregard, Paul Chesser, Stéphanie de Celles, Michael Di Grappa, Isabel Dunnigan, Tom Hughes, Frederica Jacobs (zoom), Brad Nelson, Olivia Ward

Also attending: Caroline Baril, Rachel Berger, Julie Fortier (zoom), Aaron Johnson, Kristina Huneault (zoom)

ABSENT

Voting members:

Saraluz Barton-Gomez	Andrea Harland	Kamila Sobol

Amy Buckland	Moshe Lander	Ahmed Soliman
Eléanore Handsone	Muhammad Ilyas Nadeem	Preethi Srikanth
		Roberto Viereck-Salinas

Non-voting members: Kathleen Lizé, Frederica Martin

1. Call to order

The Chair called the meeting to order at 2:04 p.m.

1.1 **Approval of the Agenda**

R-2026-2-1 Upon motion duly moved and seconded, it was unanimously resolved that the Agenda of the Open Session be approved with item 4 being moved to the Regular Agenda.

1.2 **Adoption of February 6, 2026 Minutes**

R-2026-2-2 Upon motion duly moved and seconded, it was unanimously resolved that the Minutes of the Open Session meeting of February 6, 2026 be adopted.

CONSENT

2. Committee report (Document US-2026-2-D1)

The report was provided for information only.

3. Committee appointments (Document US-2026-2-D2)

R-2026-2-3 Upon motion duly moved and seconded, it was unanimously resolved that the Committee and Faculty Tribunal Pool appointments be approved.

REGULAR

4. Business arising from the Minutes not included on the Agenda

There was no business arising from the Minutes not included on the Agenda.

5. President's remarks

- Dr. Carr began by noting some recent student accomplishments:
    - Two teams from the John Molson School of Business competed and won silver medals at prestigious international case competitions at the University of Navarra, Spain and in Belgrade, Serbia.

- Five students from the Public Policy and Public Administration Master's Degree program in Political Science won the National Public Administration Case Competition in Ottawa. This win resulted in Concordia becoming the first university to win the top prize two years running since the competition was created 15 years ago.

- The University's engineering and business students hosted the EngComm case competition in February, attracting teams from across Canada and the US, including UC Berkeley and UT Austin, Maastricht University in Europe and King Faud University in Saudi Arabia.

- Dr. Carr congratulated Gina Cody School of Engineering and Computer Science faculty member Dr. Chun Yan An, one of eight individuals who received the Dorothy KIlliam Fellowship (valued at $80K), which is designed to support scholars with exceptional ability to pursue research. Dr. An's work focuses on coastal resilience and how to anticipate and prepare for environmental emergencies.

- On April 17th, the University will award an honorary doctorate to Gina McCarthy, former White House National Climate Advisor, at a special conferral ceremony. G. McCarthy has an extraordinary career in academia and government, in public health and the environment. The University will be celebrating her achievements because they align so well with all that we are doing in the climate action sphere, and at a moment when sustainability champions are facing unprecedented obstacles in other countries.

- An example of the positive impact that the University has on the *rayonnement* of Quebec is all the publicity that focused on Montreal following the awarding of an Oscar to the National Film Board for the animation film, *The Girl Who Cried Pearls.* The co-creator of the film, Maciek Szczerbowski, is a BFA 94 grad in scenography. Seven other Concordia graduates from different domains in fine arts worked on the film as well.

- Over the past few months, Interim Provost E. Diamantoudi has been visiting departments and faculties on an individual basis to discuss among other things the need to develop new academic programs going forward. Following these visits, the Office of the Provost has already received suggestions and ideas for 30 academic programs, which are being assessed.

- In mid-February, the University received ministerial approval and launched two new undergraduate programs in cybersecurity: a Bachelor of Science (BSc) in

Cybersecurity and a Bachelor of Engineering (BEng) in Cybersecurity. While the approval for the programs was only received two weeks before the March 1st application deadline, the programs have already received 400 applications.

- Fall 2026 will be the first intake of students to B Eng in Chemical and Materials Engineering. New admissions are at 136 in Chemical and Materials Engineering and significantly, 80 of those admitted are women. Dr. Carr congratulated the Gina Cody School of Engineering and Computer Science on this remarkable development, noting that the University has been committed to increased gender equity in disciples where historically women have been underrepresented.

- Dr. Carr reported that the STRIVE Task Force on Identity-based Violence has now completed its work. The Task Force was created to examine issues related to antisemitism, anti-Asian racism, transphobia, anti-Arab racism and Islamophobia, as well as the cross-cutting themes of campus climate and campus engagement. The co-chairs compiled the findings of the working groups into a draft report with recommendations, which was presented to a steering committee made up of the heads of the sub-committees and other members of the University community. Following the steering committee's review, a second version of the report has been finalized and presented to Dr. Carr, as well as to Senior Administration, including the deans. The report will be made public mid-April, which is the two-year anniversary of the establishment of the Task Force.

- Once the STRIVE Task Force's report is made public, an implementation committee will be constituted to map next steps forward. The gist of the report is that as a community, while we seek to learn from the past, it is essential to focus on the future to find ways to improve the experience on campus, which will benefit all members of the community.

- On the tuition litigation dossier, Dr. Carr noted that, as already discussed at a previous Senate meeting, the University decided not to launch a new lawsuit contesting the Québec government's increase of Rest of Canada student tuition fees. The government's right to set tuition can't be contested, the issue being if the set amount is justifiable. The government complied with the letter of the judgment, but in the University's view, not the spirit.

- The University's assessment of the 'legality' of the new justification for the tuition increase was complicated because even before the government provided its latest justification, Concordia's co-plaintiff, McGill, had already increased Rest of Canada tuition beyond the government's $12K threshold and is now charging out-of-province students $14K in business and engineering. Thus, on the balance of factors, the University decided not to take on the expense of a new court case. Instead, the

University wishes to start afresh with the government, reaffirming Concordia's role and contribution to society and the province's economy.

- Discussions are continuing with the government to provide increased French-language learning opportunities for students to better enable them to choose to stay in Québec after graduation and the University has begun new initiatives to support that goal. As an example, in the EV Building today, there is a job fair that aims to link international engineering students with employers and organizations in the regions through the program *Réussir en français* in an effort to help students increase their employability and make the choice to stay in the province while helping regions address professional labor shortages. There are plans to expand this program to include students in other disciplines next year.

- Next week, Dr. Carr and his chief of staff, William Cheaib will join Minister Biron on a higher education mission to France, to announce some new bilateral partnerships and to raise Concordia's visibility as a destination university for French students. As of date, Concordia will be the only anglophone university participating in the mission.

- Dr. Carr reported on recruitment, providing a high-level overview of current application patterns. He noted that this year, CEGEP applications have decreased, largely because of a decrease in applicants from anglophone CEGEPs, which are traditionally the major source of undergraduate students. However, there have been small increases in applications from francophone CEGEPs, Rest of Canada students, and inter-institutional transfers. There have also been efforts underway to encourage students who were previously enrolled and withdrew to return to their studies. At the graduate level, there has been an encouraging 30% increase in PhD applications. The federal government's commitment to fast-track visas for international PhD students to a two-week period that was announced in December 2025 seems to be bearing fruit.

- Dr. Carr concluded his remarks by sharing updates from the provincial budget that had been announced the week before. Most details are still pending, and because the university network had very low expectations, it was a surprise to see any increase in the overall higher education grant. However, it should also be noted that higher education funding is not only distributed to the universities but also funds CEGEPs and the activities of the Ministry, therefore it is unclear what any distribution across sectors will amount to. Details of individual allocations are forthcoming, but there is at least some possibility that the University could receive marginal benefits. That said, it is important to note that the government of Québec is currently facing a significant structural deficit. Therefore, the University needs to be prepared for the

possibility that, after the fall 2026 elections, regardless of which party takes power, more budget cuts could be made early in the new government's mandate.

6. Academic update (Document US-2026-2-D3)

There were no additional updates to the report that was provided.

7. Policy on Research Entities (Document US-2026-2-D4)

T. Evans introduced the item and explained that following the presentation of the policy to Senate in February, the policy document was revised to include feedback from Senate and also input that was received from Senators. The modified document was presented to the Senate Research Committee, and following recommendation of the Senate Research Committee is being recommended to Senate for approval.

R-2026-2-4 *Upon motion duly moved and seconded, it was unanimously resolved that, upon recommendation of the Senate Research Committee, Senate approve revisions to the Policy on Research Units and Infrastructure Platforms (VPRGS-8), now being renamed as Policy on Research Entities (VPRII-8) as detailed in the attached documentation.*

8. Department Name Change: Concordia Institute for Information Systems Engineering (CIISE) to the Department of Cybersecurity and Intelligent Systems Engineering (Document US-2026-2-D5)

Dean Debbabi presented this item that as per the protocol, the name of the departments at the University usually includes the name of programs, in its title/description. As such, the current CIISE is being recommended to be renamed: Department of Cybersecurity and Intelligent Systems Engineering.

R-2026-2-5 *Upon motion duly moved and seconded, it was unanimously resolved that, following recommendation of the Faculty Council of the Gina Cody School of Engineering and Computer Science Senate recommend to the Board of Governors that the Concordia Institute for Information Systems Engineering (CIISE) be renamed as the Department of Cybersecurity and Intelligent Systems Engineering.*

9. Question period

A Senator expressed concern about incidents on campus targeting a Holocaust Studies professor and the Azrieli institute. The Senator noted that they hoped that the recommendations in the forthcoming STRIVE Task Force report would take note of what is happening on campus, as it is critical for all community members to feel safe on campus.

There were questions from Senators about the process for bringing motions to Senate in light of a refusal to entertain a motion from the floor at a previous Senate meeting, and another motion that was brought to Senate Steering but ultimately not included in the agenda of Senate. In addition, a Senator asserted that the mandate of Senate (pursuant to the

By-laws) allows it to consider any items that impact the academic programs at the University.

The Chair reiterated the process regarding motions at Senate, which is clearly explained at Senate Orientation and outlined in the Senate meeting procedures document. As per our governance process, it is the responsibility of Senate Steering to vet proposed motions before they are brought to Senate to ensure that the content of the draft motions is factually accurate, that the subject of the draft motions fall within the purview of Senate, and that the proposed outcome of the motion is reasonable.

There was a question about whether the quality of programs would be negatively affected because of potentially increased class sizes and the non-renewal of LTA contracts. It was noted that, in scheduling courses for the academic year, the faculty deans work closely with department chairs to determine how best to meet program requirements. Furthermore, the deferral of sabbaticals was part of the plan to ensure that adequate teaching resources are available for program delivery.

A Senator noted the recent tuition increases at McGill and asked whether there was any intention to increase tuition at Concordia. It was confirmed that the tuition for the next year had already been set and as such there were no expected tuition fee increases for 2026-27 other than those mandated by the government of Québec.

There was a question about funding for PhD students. The Senator emphasized that the University needs to find and implement adequate measures to ensure that PhD students have proper funding and to support research activities that are not always limited to the four-year programs to which PhD students are admitted.

The Chair spoke about the increase in graduate enrolment in the past few years, attributing this increase to the robust research and supervision that is offered at Concordia. The Chair also noted that the university has invested heavily in increasing financial support for graduate students over several years, and that graduate funding comes in the form of mixed offerings, including fee remissions that are offered to most entering PhD students, as well as research stipends and teaching assistantships.

10. Other business

There was no other business to bring before the Open Session.

11. Adjournment

The meeting was adjourned at 3:05 p.m.

K. Singh
Karan Singh
Secretary of Senate

ACADEMIC PROGRAMS COMMITTEE
REPORT OF APPROVED DOSSIERS
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee has approved the following changes for the Undergraduate and Graduate Calendar.

Following approval of the Faculty Councils, APC members reviewed the undergraduate and graduate curriculum submissions listed below. As a result of discussions, APC resolved that the curriculum proposals listed below be **finally approved**. The report on approved dossiers is provided to the Senate for information purposes.

1. **Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)**

Gina Cody School of Engineering and Computer Science
Department of Computer Science and Software Engineering
GCS-COMP-5982; **APC-2026-3-D10**

- Program changes
- Course changes
- Regulation chang

Department of Mechanical, Industrial and Aerospace Engineering
GCS-MIAE-5967; **APC-2026-3-D12**

- Program changes

2. **Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)**

Faculty of Arts and Science
Economics
AS-ECON-5838; **APC-2026-2-D1**

- Program changes
- Course changes

John Molson School of Business
JMSB-MSCA-5968; **APC-2026-2-D3**

- Program changes
- Course changes

Faculty of Fine Arts
Art History
FA-ARTH-5913; **APC-2026-2-D7**

- Course changes

Creative Arts Therapies
FA-CATS-5737; **APC-2026-2-D8**

- Program changes
- Course changes

- Regulation changes

Gina Cody School of Engineering and Computer Science
Centre for Engineering in Society
GCS-CES-5941; **APC-2026-2-D4**
- Program changes
- Course changes

Electrical and Computer Engineering
GCS-ELEC-5916; **APC-2026-2-D5**
- Program changes
- Course changes

GCS-ELEC-5806; **APC-2026-2-D6**
- Program changes
- Course changes

Building, Civil and Environmental Engineering
GCS-BCEE-5989; **APC-2026-3-D13**
- Program changes
- Course changes

Computer Science and Software Engineering
GCS-COMP-5971; **APC-2026-3-D14**
- Program changes
- Course changes

Mechanical, Industrial and Aerospace Engineering
GCS-MIAE-5937; **APC-2026-3-D15**
- Program changes
- Course changes
- Regulation changes



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

Undergraduate Program Regular Curriculum Change - GCS-COMP-5982 - VERSION : 2

Summary and Rationale for Changes

Course changes

New courses

1) COMP 332 Foundations for Artificial Intelligence: This is a new course that introduces the concept of modern AI which will be a core course in the Computer Science and Software Engineering programs.

2) We are creating several new permanent courses that were previously offered as special topics courses at the undergraduate or graduate level (refer to the course proposals for details). Some courses will be cross-listed with graduate courses (a corresponding graduate curriculum dossier, GCS-COMP-5971, is submitted concurrently). These courses are being added to the appropriate lists of electives in the BCompSc and Software Engineering programs.

- COMP 330 Introduction to Competitive Programming and Algorithmic Problem Solving
- COMP 434 Distributed Learning
- SOEN 472 Generative AI for Software Engineering
- SOEN 473 Automated Program Analysis and Program Synthesis
- SOEN 474 AI-Driven Software Improvement and Repair

Course deletions

- SOEN 342 Software Requirements and Deployment: This course is being deleted because of overlap of course content with SOEN 341 and SOEN 343. This also allows for AI core content to be added to the program.

Other course changes

- COMP 432 Machine Learning: COMP 352 is being replaced by COMP 332 as the prerequisite because the foundation in AI is necessary for Machine Learning and COMP 352 is not needed.
- COMP 433 Introduction to Deep Learning: COMP 352 is being replaced by COMP 432 as the concurrent prerequisite because COMP 432 is the more relevant prerequisite.
- COMP 472 Symbolic Artificial Intelligence: The title and description are updated to reflect that the course covers mainly Semantic AI.
- SOEN 341 Software Process and Practices: The course description is being updated.
- SOEN 343 Software Architecture and Design: SOEN 342 is removed from the prerequisites as it is being deleted. (SOEN 341 is sufficient preparation.)

Program changes

Computer Science

- An AI Core (consisting of COMP 332 Foundations for AI) is being added to ensure foundational AI training.
- An Option in AI is being added so that an AI specialization can be officially recognized on the transcript. Instead of taking 14 credits of computer science electives, students take AI core courses and electives.
- Computer Science Electives: New courses are added.
- General electives: The restrictions on French-language courses are being removed from the exclusion list to allow students to take more French-language courses.

Software Engineering

- Software Engineering Core: SOEN 342 is being removed because it is deleted (see above). Course content overlaps with SOEN 341 and 343, so this will not adversely impact on students' acquisition of necessary knowledge and skills.
- An AI Core, consisting of COMP 332 and COMP 432 (Machine Learning), is being added to ensure AI training. (COMP 432 is moved from Computer Science Core.)
- The Computer Science Core is re-named (rather than Computer Science Group) as the term "core" (rather than "group") is more appropriate for required courses.
- Software Engineering Electives: The total credit weight is reduced by 1 credit to help accommodate adding the AI Core while not impacting the overall program credit weight and new courses are added.

Other programs impacted

- Program changes are included for the Aerospace Engineering (Option C) and Computer Engineering programs to remove SOEN 342 (deleted) from lists of electives.

Resource Implications

None. New courses will be taught as part of the normal teaching loads of instructors in the Department.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Feb 2026

The dossier was approved by GCS Council with no modifications requested.
GCS Council document number: ECFC 2026.02.01

Summary of Committee Discussion: FCC/FAPC/GCS Approval

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Feb 2026

Approved by:

Otmane Ait Mohamed, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 22 Jan 2026

Summary of Committee Discussion: Department approval

For Submission to:

Otmane Ait Mohamed, Associate dean, academic programs,
ECS Undergraduate Studies Committee meeting, 22 Jan 2026

Approved by:

Joey Paquet, Chair, Dept of CSSE,
CSSE Department Council, 16 Jan 2026

The dossier passed unanimously at the CSSE department meeting.

Summary of Changes (Undergraduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
COMP 330 - NEW	★	★	★	★	★	★	★	★	★	
COMP 332 - NEW	★	★	★	★	★		★	★	★	
COMP 432					✎					
COMP 433					✎					
COMP 434 - NEW	★	★	★	★	★		★	★	★	★
COMP 472			✎	✎						
SOEN 341				✎						
SOEN 342 - deletion	⊗	⊗	⊗	⊗	⊗		⊗	⊗	⊗	
SOEN 343					✎					
SOEN 472 - NEW	★	★	★	★	★		★	★	★	★
SOEN 473 - NEW	★	★	★	★	★		★	★	★	
SOEN 474 - NEW	★	★	★	★	★		★	★	★	

Program Changes:

	Suspend Admissions	Program Degree Type	Program Title Change	Program Require-ments	Change to Program Type	Change to Total Credit	Change to Primary Campus

		Change		Change		Value of Program	
Software Engineering - degree requirements							

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Computer Eng Electives (Software and System Design)			
Aerospace Eng Option C Electives			
BCompSc - AI Core			
BCompSc - Computer Science Electives			
General Electives Exclusion List Change			
BCompSc electives - AI Group			
BCompSc - Option in AI - NEW			
Software Engineering Core			
Software Engineering - AI Core (new)			
Software Engineering - Computer Science Core			
Software Engineering Electives			
Software Engineering Electives - AI Group			

Regulation Changes:

- BCompSc - Degree Requirements
- Software Engineering - description
- Software Engineering - degree requirements

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Software and System Design Electives: Computer Engineering
Calendar Section Type: Defined group
Description of Change: Computer Eng Electives (Software and System Design)

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.30 Department of Electrical and Computer Engineering > Section 71.30.2 Course Requirements (BEng in Computer Engineering) > Degree Requirements > BEng in Computer Engineering > Computer Engineering Electives

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
Software and System Design Electives: Computer Engineering	**credits**	Software and System Design Electives: Computer Engineering
COEN 421 Embedded Systems Design (4) COEN 422 Foundations of Cyber-Physical Systems (3) COEN 432 Applied Machine Learning and Evolutionary Algorithms (3) COEN 448 Software Testing and Validation (3.5) COEN 449 Neural Networks and Machine Learning (3) SOEN ~~342 Software Requirements and Deployment (3)~~ ~~SOEN~~ 343 Software Architecture and Design (4) SOEN 344 Advanced Software Architecture and Design (3) SOEN 357 User Interface Design (3)		COEN 421 Embedded Systems Design (4) COEN 422 Foundations of Cyber-Physical Systems (3) COEN 432 Applied Machine Learning and Evolutionary Algorithms (3) COEN 448 Software Testing and Validation (3.5) COEN 449 Neural Networks and Machine Learning (3) SOEN 343 Software Architecture and Design (4) SOEN 344 Advanced Software Architecture and Design (3) SOEN 357 User Interface Design (3)

Rationale:
SOEN 342 is being deleted (course change submitted concurrently), so must be removed from this list of courses.

Resource Implications:
None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Option C — Avionics and Aerospace Systems Electives
Calendar Section Type: Defined group
Description of Change: Aerospace Eng Option C Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.55 Aerospace Engineering > Course Requirements (BEng in Aerospace Engineering) > Degree Requirements > BEng in Aerospace Engineering > Aerospace Engineering Option Requirements > Option C — Avionics and Aerospace Systems

Type of Change: Defined Group Change

	Present Text calendar		Proposed Text
4.75 credits	Option C — Avionics and Aerospace Systems Electives	**4.75 credits**	Option C — Avionics and Aerospace Systems Electives
	4.75 credits minimum chosen from the following courses: AERO 471 Aircraft Hydro-Mechanical and Fuel Systems (3.5) AERO 472 Aircraft Pneumatic and Electrical Power Systems (3.5) AERO 480 Flight Control Systems (3.5) COEN 313 Digital Systems Design II (3.5) COEN 317 Microprocessor-Based Systems (3.5) COEN 320 Introduction to Real-Time Systems (3.5) COEN 346 Operating Systems (3.5) COEN 366 Communication Networks and Protocols (3.5) COEN 413 Hardware Functional Verification (3.5) COEN 421 Embedded Systems Design (4) COEN 498 Topics in Computer Engineering (3) ELEC 251 Fundamentals of Applied Electromagnetics (3) ELEC 311 Electronics I (3.5) ELEC 331 Fundamentals of Electrical Power Engineering (3.5) ELEC 351 Electromagnetic Waves and Guiding Structures (3.5) ELEC 367 Introduction to Digital Communications (3.5) ELEC 433 Power Electronics (3.5)		4.75 credits minimum chosen from the following courses: AERO 471 Aircraft Hydro-Mechanical and Fuel Systems (3.5) AERO 472 Aircraft Pneumatic and Electrical Power Systems (3.5) AERO 480 Flight Control Systems (3.5) COEN 313 Digital Systems Design II (3.5) COEN 317 Microprocessor-Based Systems (3.5) COEN 320 Introduction to Real-Time Systems (3.5) COEN 346 Operating Systems (3.5) COEN 366 Communication Networks and Protocols (3.5) COEN 413 Hardware Functional Verification (3.5) COEN 421 Embedded Systems Design (4) COEN 498 Topics in Computer Engineering (3) ELEC 251 Fundamentals of Applied Electromagnetics (3) ELEC 311 Electronics I (3.5) ELEC 331 Fundamentals of Electrical Power Engineering (3.5) ELEC 351 Electromagnetic Waves and Guiding Structures (3.5) ELEC 367 Introduction to Digital Communications (3.5) ELEC 433 Power Electronics (3.5)

Present Text calendar	Proposed Text
ELEC 442 Advanced Signal Processing (3) ELEC 458 Techniques in Electromagnetic Compatibility (3) ELEC 464 Wireless Communications (3) ELEC 482 System Optimization (3.5) ELEC 498 Topics in Electrical Engineering (3) ENGR 411 Special Technical Report (1) ENGR 412 Honours Research Project (3) SOEN ~~342 Software Requirements and Deployment (3)~~ ~~SOEN~~ 343 Software Architecture and Design (4) Note: Students having a GPA of 3.0 or more may submit a request to take a graduate course as an elective. Note: With permission of the Department, students may take one technical elective outside of the option list above. Students must get approval from the Department before registering in the technical elective outside of the option list above.	ELEC 442 Advanced Signal Processing (3) ELEC 458 Techniques in Electromagnetic Compatibility (3) ELEC 464 Wireless Communications (3) ELEC 482 System Optimization (3.5) ELEC 498 Topics in Electrical Engineering (3) ENGR 411 Special Technical Report (1) ENGR 412 Honours Research Project (3) SOEN 343 Software Architecture and Design (4) Note: Students having a GPA of 3.0 or more may submit a request to take a graduate course as an elective. Note: With permission of the Department, students may take one technical elective outside of the option list above. Students must get approval from the Department before registering in the technical elective outside of the option list above.

Rationale:

SOEN 342 is being deleted (course change submitted concurrently), so must be removed from this list of courses.

Resource Implications:

None.

REGULATIONS CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Degree Requirements
Calendar Section Type: Regulation
Description of Change: BCompSc - Degree Requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Type of change: Regulation Change

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.2 Degree Requirements (BCompSc)

Present Text calendar	Proposed Text
Degree Requirements	Degree Requirements
To be recommended for the degree of BCompSc, students must satisfactorily complete an approved program of at least 90 credits comprising the courses of the Computer Science Core , the Computer Science Complementary Core , Computer Science Electives , Mathematics Electives: BCompSc , and the remaining courses comprised of Minor and/or General Electives: BCompSc in accordance with the graduation requirements of Section 71.10.5 Graduation Regulations . The program also offers the BCompSc degree in the form of two joint major degrees (see Section 71.70.1 Curriculum for the Degree of Bachelor of/Baccalaureate in Computer Science).	To be recommended for the degree of BCompSc, students must satisfactorily complete an approved program of at least 90 credits comprising the courses of the Computer Science Core , the Computer Science Complementary Core , Computer Science Electives , Mathematics Electives: BCompSc , Artificial Intelligence Core , and the remaining courses comprised of Minor and/or General Electives: BCompSc in accordance with the graduation requirements of Section 71.10.5 Graduation Regulations . The **AI option** requires students to replace the credits in the Computer Science Electives with the courses in the Option in Artificial Intelligence . The program also offers the BCompSc degree in the form of two joint major degrees (see Section 71.70.1 Curriculum for the Degree of Bachelor of/Baccalaureate in Computer Science).
Students may not register for a 400-level course before completing all of the 200-level Computer Science Core courses of their program.	Students may not register for a 400-level course before completing all of the 200-level Computer Science Core courses of their program.
The Gina Cody School of Engineering and Computer Science is committed to ensuring that its students possess good writing skills. Hence, every student in an undergraduate degree program is required to demonstrate competence in writing English or French prior to graduation.	The Gina Cody School of Engineering and Computer Science is committed to ensuring that its students possess good writing skills. Hence, every student in an undergraduate degree program is required to demonstrate competence in writing English or French prior to graduation.
All students admitted to the Gina Cody School of Engineering and Computer Science must meet the writing skills requirement as outlined in Section 71.20.7 Writing Skills Requirement .	All students admitted to the Gina Cody School of Engineering and Computer Science must meet the writing skills requirement as outlined in Section 71.20.7 Writing Skills Requirement .
If a student has satisfied the writing skills requirement prior to transferring to the Gina Cody School of Engineering and Computer Science, that student is deemed to have satisfied the writing skills requirement.	If a student has satisfied the writing skills requirement prior to

Present Text calendar	Proposed Text
	transferring to the Gina Cody School of Engineering and Computer Science, that student is deemed to have satisfied the writing skills requirement.
Newly admitted students are strongly encouraged to meet the requirement very early in their program (fall term of first year for students starting in September or winter term of first year for students starting in January) to avoid the risk of delayed graduation should remedial work prove necessary. Students who are required to take ESL courses should meet the Faculty writing skills requirements in the term following completion of their ESL courses.	Newly admitted students are strongly encouraged to meet the requirement very early in their program (fall term of first year for students starting in September or winter term of first year for students starting in January) to avoid the risk of delayed graduation should remedial work prove necessary. Students who are required to take ESL courses should meet the Faculty writing skills requirements in the term following completion of their ESL courses.

Rationale:

We are adding the new AI Core and reference to the new AI option to the degree requirements introductory text for the BCompSc program.

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Artificial Intelligence Core
Calendar Section Type: Defined group
Description of Change: BCompSc - AI Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.2 Degree Requirements (BCompSc) > Degree Requirements > BCompSc in Computer Science

Type of Change: Defined Group Change

Present Text calendar	Proposed Text
4 credits Artificial Intelligence ~~Electives~~	**4 credits** Artificial Intelligence Core
~~4 credits minimum chosen from the following list:~~ ~~Artificial~~ Intelligence ~~Group: BCompSc~~	COMP 332 Foundations for Artificial Intelligence (4)

Rationale:
We are adding a required Foundations of AI course (COMP 332) to the BCompSc rather than requiring students to take a minimum of 4 credits of AI electives from a list of courses, so that students have a consistent AI foundation.

Resource Implications:
None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Computer Science Electives
Calendar Section Type: Defined group
Description of Change: BCompSc - Computer Science Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.2 Degree Requirements (BCompSc) > Degree Requirements > BCompSc in Computer Science

Type of Change: Defined Group Change

	Present Text calendar		Proposed Text
14 credits	Computer Science Electives	**14 credits**	Computer Science Electives
	Computer Science Electives must be chosen from the following: 1) All COMP courses with numbers 325 or higher 2) COMP and SOEN courses with numbers between 6000 and 6951 (maximum of eight credits, and with permission from the Department) 3) Students may also choose from the courses listed below: ENGR 490 Multidisciplinary Capstone Design Project (6) SOEN 287 Web Programming (3) SOEN 321 Information Systems Security (3) SOEN 331 Formal Methods for Software Engineering (3) SOEN 357 User Interface Design (3) SOEN 387 Web-Based Enterprise Application Design (3) SOEN 422 Embedded Systems and Software (4) SOEN 423 Distributed Systems (4) SOEN 471 Big Data Analytics (4) SOEN ~~487 Web Services~~ and ~~Applications~~ (4) SOEN 487 Web Services and Applications (4) ~~Elective~~ courses are listed in the following groups to facilitate the selection of courses in a particular		Computer Science Electives must be chosen from the following: 1) All COMP courses with numbers 325 or higher 2) COMP and SOEN courses with numbers between 6000 and 6951 (maximum of eight credits, and with permission from the Department) 3) Students may also choose from the courses listed below: ENGR 490 Multidisciplinary Capstone Design Project (6) SOEN 287 Web Programming (3) SOEN 321 Information Systems Security (3) SOEN 331 Formal Methods for Software Engineering (3) SOEN 357 User Interface Design (3) SOEN 387 Web-Based Enterprise Application Design (3) SOEN 422 Embedded Systems and Software (4) SOEN 423 Distributed Systems (4) SOEN 471 Big Data Analytics (4) SOEN 472 Generative Artificial Intelligence for Software Engineering (4) SOEN 473 Automated Program Analysis and Program Synthesis (3) SOEN 474 AI-Driven Software Improvement and Repair (4) SOEN 487 Web Services and Applications (4)

D7

Present Text calendar	Proposed Text
area of the field: Artificial Intelligence Group: BCompSc Computer Games Group: BCompSc Data Analytics Group: BCompSc Web Services and Applications Group: BCompSc Note: Any credits exceeding the required number of Computer Science Elective credits will accrue towards the General Elective credits.	Elective courses are listed in the following groups to facilitate the selection of courses in a particular area of the field: Artificial Intelligence Group: BCompSc Computer Games Group: BCompSc Data Analytics Group: BCompSc Web Services and Applications Group: BCompSc Note: Any credits exceeding the required number of Computer Science Elective credits will accrue towards the General Elective credits.

Rationale:

We are adding new courses SOEN 472, SOEN 473 and SOEN 474 to the Computer Science general electives as BCompSc students can take these elective courses.

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: General Electives Exclusion List
Calendar Section Type: Defined group
Description of Change: General Electives Exclusion List Change

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.2 Degree Requirements (BCompSc) > Degree Requirements > BCompSc in Computer Science > General Electives: BCompSc

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
General Electives Exclusion List	**credits**	General Electives Exclusion List
1. The following courses may not be taken to fulfill the General Electives requirement: BCEE 231 Structured Programming and Applications for Building and Civil Engineers (3) BIOL 322 Biostatistics (3) BTM 380 Business Application Development (3) BTM 382 Database Management (3) CART 315 Digital Game Prototyping (3) COMM 215 Business Statistics (3) EXCI 322 Statistics for Exercise Science (3) GEOG 264 Programming for Environmental Sciences (3) INTE 296 Discover Statistics (3) MAST 221 Applied Probability (3) MAST 333 Applied Statistics (3) MIAE 215 Programming for Mechanical, Industrial and Aerospace Engineers (3.5) PHYS 235 Object-Oriented Programming and Applications (3) PHYS 236 Numerical Methods in Physics with Python (3) SOCI 212 Statistics I (3)		1. The following courses may not be taken to fulfill the General Electives requirement: BCEE 231 Structured Programming and Applications for Building and Civil Engineers (3) BIOL 322 Biostatistics (3) BTM 380 Business Application Development (3) BTM 382 Database Management (3) CART 315 Digital Game Prototyping (3) COMM 215 Business Statistics (3) EXCI 322 Statistics for Exercise Science (3) GEOG 264 Programming for Environmental Sciences (3) INTE 296 Discover Statistics (3) MAST 221 Applied Probability (3) MAST 333 Applied Statistics (3) MIAE 215 Programming for Mechanical, Industrial and Aerospace Engineers (3.5) PHYS 235 Object-Oriented Programming and Applications (3) PHYS 236 Numerical Methods in Physics with Python (3) SOCI 212 Statistics I (3)
2. COEN courses or INTE courses can only be taken with permission. In general, courses offered outside the Department of CSSE that contain substantial programming or computer science content may not be taken. Such courses may qualify as a General Elective only with prior written permission on a GCS Student Request form, obtainable from the Office of Student Academic Services in the Gina Cody School of		2. COEN courses or INTE courses can only be taken with permission. In general, courses offered outside the Department of CSSE that contain substantial programming or computer science content may not be taken. Such courses may qualify as a General Elective only with prior written permission on a GCS Student Request form, obtainable from the Office of Student Academic Services in the Gina Cody School of

Present Text calendar	Proposed Text
Engineering and Computer Science. 3. ~~At most, six credits of the following courses may be taken for credit towards the General Electives requirement:~~ ~~FRAN 211 French Language: Elementary (6)~~ ~~FRAN 212 French Language: Transitional Level (6)~~ ~~FRAN 215 Langue française : niveau intermédiaire II (3)~~ ~~4.~~ ESL courses may not be taken to fulfill the General Electives requirement.	Engineering and Computer Science. 3. ESL courses may not be taken to fulfill the General Electives requirement.

Rationale:

We are removing the restrictions on taking French courses to allow students to take as many French courses as they want for their general electives. This will especially benefit international/out-of-province undergraduate students to help them meet any French language requirements.

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Artificial Intelligence Group: BCompSc
Calendar Section Type: Defined group
Description of Change: BCompSc electives - AI Group

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.2 Degree Requirements (BCompSc) > Computer Science Elective Course Groups

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
Artificial Intelligence Group: BCompSc	**credits**	Artificial Intelligence Group: BCompSc
COMP 425 Computer Vision (4) COMP 432 Machine Learning (4) COMP 433 Introduction to Deep Learning (4) COMP 472 Artificial Intelligence (4) COMP 473 Pattern Recognition (4) COMP 474 Intelligent Systems (4) COMP 479 Information Retrieval and Web Search (4)		COMP 425 Computer Vision (4) COMP 432 Machine Learning (4) COMP 433 Introduction to Deep Learning (4) COMP 434 Distributed Learning (3) COMP 472 Symbolic Artificial Intelligence (4) COMP 473 Pattern Recognition (4) COMP 474 Intelligent Systems (4) COMP 479 Information Retrieval and Web Search (4)

Rationale:
We are adding new course COMP 434 to the AI Group of electives in the BCompSc as the course is relevant to this group.

Resource Implications:
None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Option in Artificial Intelligence
Calendar Section Type: Defined group
Description of Change: BCompSc - Option in AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.2 Degree Requirements (BCompSc)

Type of Change: New Defined Group

Present Text calendar	Proposed Text
	14 credits Option in Artificial Intelligence
0	~~0~~ Students registered in the Artificial Intelligence option must take the courses below instead of the Computer Science Electives 8 credits: COMP 432 Machine Learning (4) COMP 433 Introduction to Deep Learning (4) 6 credits chosen from Artificial Intelligence Group: BCompSc

Rationale:
We are creating an Option in AI, which will allow students in the BCompSc to have their specialization formally recognized on their transcript. Instead of taking general COMP electives, they will be required to take AI courses.

Resource Implications:
None.

REGULATIONS CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Software Engineering Program
Calendar Section Type: Regulation
Description of Change: Software Engineering - description

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Type of change: Regulation Change

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.8 Curriculum for the Degree of BEng in Software Engineering

Present Text calendar	Proposed Text
Software Engineering Program	Software Engineering Program
The Software Engineering program is built on the fundamentals of computer science, an engineering core, and a discipline core in Software Engineering to cover the engineering approach to all phases of the software process and related topics.	The Software Engineering program is built on the fundamentals of computer science, an AI core, an engineering core, and a discipline core in Software Engineering to cover the engineering approach to all phases of the software process and related topics.
The curriculum builds on the traditional computer science core topics of computer ~~mathematics,~~ theory, programming methodology, and mainstream applications to provide the computing theory and practice which underlie the discipline. The engineering core covers basic science, professional topics, and introduces the engineering approach to problem solving. The program core in Software Engineering includes advanced programming techniques, software specification, design, architecture, as well as metrics, security, project management, and ~~quality control.~~ The electives cover a broad range of advanced topics, from formal ~~methods to distributed~~ systems.	The curriculum builds on the traditional computer science core topics of computer mathematics theory, artificial intelligence, programming methodology, and mainstream applications to provide the computing theory and practice which underlie the discipline. The engineering core covers basic science, professional topics, and introduces the engineering approach to problem solving. The program core in Software Engineering includes advanced programming techniques, software specification, design, architecture, databases, as well as metrics, security, project management, quality control, and the development of systems with AI. The electives cover a broad range of advanced topics, from formal methods, AI, and large scale software systems.
Extended Credit Program	**Extended Credit Program**
The requirements of the Extended Credit Program (ECP) are set out in Section 71.20.2 Alternative Entry Programs .	The requirements of the Extended Credit Program (ECP) are set out in Section 71.20.2 Alternative Entry Programs .

Rationale:
We are updating the program description to keep it in line with the current program requirements.

Resource Implications:
None.

Undergraduate Program Regular Curriculum Change - GCS-COMP-5982 - VERSION : 2

REGULATIONS CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Degree Requirements
Calendar Section Type: Regulation
Description of Change: Software Engineering - degree requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Type of change: Regulation Change

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering

Present Text calendar	Proposed Text
Degree Requirements	Degree Requirements
Students registered in the Software Engineering program must complete a minimum of 120 credits during four years of ~~full-time~~ study. The program consists of the Engineering Core, the Software Engineering Core and electives.	Students registered in the Software Engineering program must complete a minimum of 120 credits during four years of full-time study. The program consists of the Engineering Core, the Software Engineering Core , the Computer Science Core: Software Engineering , the Artificial Intelligence Core : Software Engineering , and electives.

Rationale:
We are updating the degree requirements to incorporate the Computer Science and AI Cores.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: BEng in Software Engineering
Calendar Section Type: Program
Description of Change: Software Engineering - degree requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering
Program Name: BEng in Software Engineering
Program Type: None
Degree: Bachelor/Baccalaureate of Engineering (BEng)

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering > Degree Requirements

Type of Change: Program Change

Present Text calendar	**Proposed Text**
120 credits BEng in Software Engineering	**120 credits** BEng in Software Engineering
27.5 credits from the Engineering Core	27.5 credits from the Engineering Core
~~46.5~~ credits from the Software Engineering Core	43.5 credits from the Software Engineering Core
~~27~~ credits from the Computer Science ~~Group:~~ Software Engineering	8 credits from the Artificial Intelligence Core : Software Engineering
3 credits from the Engineering and Natural Science Group: Software Engineering	23 credits from the Computer Science Core: Software Engineering
~~16~~ credits of Software Engineering Electives	3 credits from the Engineering and Natural Science Group: Software Engineering
	15 credits of Software Engineering Electives

Rationale:

The credit values in this section are being updated to reflect other changes submitted concurrently in this dossier.

Resource Implications:
None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Software Engineering Core
Calendar Section Type: Defined group
Description of Change: Software Engineering Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering > Degree Requirements > BEng in Software Engineering

Type of Change: Defined Group Change

Present Text calendar	Proposed Text
~~46.5~~ credits Software Engineering Core	**43.5 credits** Software Engineering Core
~~46.5~~ credits: SOEN 228 System Hardware (4) SOEN 287 Web Programming (3) SOEN 321 Information Systems Security (3) SOEN 331 Formal Methods for Software Engineering (3) SOEN 341 Software Process and Practices (4) ~~SOEN 342 Software Requirements and Deployment (3)~~ SOEN 343 Software Architecture and Design (4) SOEN 345 Software Testing, Verification and Quality Assurance (4) SOEN 357 User Interface Design (3) SOEN 363 Data Systems for Software Engineers (3) SOEN 384 Management, Measurement and Quality Control (3) SOEN 390 Software Engineering Team Design Project (3.5) SOEN 490 Capstone Software Engineering Design Project (6) Note: Students may replace SOEN 490 with ENGR 490 if they are interested in a multidisciplinary project that requires collaboration with students from other engineering departments. In order for students to register in ENGR 490 , their projects must be approved by the ENGR 490 Design Committee before the start of the fall term.	43.5 credits: SOEN 228 System Hardware (4) SOEN 287 Web Programming (3) SOEN 321 Information Systems Security (3) SOEN 331 Formal Methods for Software Engineering (3) SOEN 341 Software Process and Practices (4) SOEN 343 Software Architecture and Design (4) SOEN 345 Software Testing, Verification and Quality Assurance (4) SOEN 357 User Interface Design (3) SOEN 363 Data Systems for Software Engineers (3) SOEN 384 Management, Measurement and Quality Control (3) SOEN 390 Software Engineering Team Design Project (3.5) SOEN 490 Capstone Software Engineering Design Project (6) Note: Students may replace SOEN 490 with ENGR 490 if they are interested in a multidisciplinary project that requires collaboration with students from other engineering departments. In order for students to register in ENGR 490 , their projects must be approved by the ENGR 490 Design Committee before the start of the fall term.

Present Text calendar **Proposed Text**

Rationale:

We are removing SOEN 342 from the Software Engineering Core as this course is deleted due to redundancy with other courses. (The course change is submitted concurrently.)

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change

Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Artificial Intelligence Core : Software Engineering

Calendar Section Type: Defined group

Description of Change: Software Engineering - AI Core (new)

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering > Degree Requirements > BEng in Software Engineering

Type of Change: New Defined Group

Present Text calendar	Proposed Text
	8 credits Artificial Intelligence Core : Software Engineering
0	~~0~~ COMP 332 Foundations for Artificial Intelligence (4) COMP 432 Machine Learning (4)

Rationale:

We are adding the new course COMP 332 (Foundations for AI) and existing course COMP 432 Machine Learning as a required AI Core (8 credits) in the Software Engineering program. (COMP 432 is moved from the Computer Science Group of core courses.) As the emerging field of AI is very important in Computer Science, we must ensure that BCompSc students are introduced to both fundamental and advanced modern AI topics. (See new course proposal for COMP 332 submitted concurrently.)

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Computer Science Core: Software Engineering
Calendar Section Type: Defined group
Description of Change: Software Engineering - Computer Science Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering > Degree Requirements > BEng in Software Engineering

Type of Change: Defined Group Change

	Present Text calendar		Proposed Text
~~27~~ **credits**	Computer Science ~~Group:~~ Software Engineering	**23 credits**	Computer Science Core: Software Engineering
	COMP 232 Mathematics for Computer Science (3)		COMP 232 Mathematics for Computer Science (3)
	COMP 248 Object-Oriented Programming I (3.5) COMP 249 Object-Oriented Programming II (3.5) COMP 335 Introduction to Theoretical Computer Science (3) COMP 346 Operating Systems (4) COMP 348 Principles of Programming Languages (3) COMP 352 Data Structures and Algorithms (3) ~~COMP 432 Machine Learning (4)~~		COMP 248 Object-Oriented Programming I (3.5) COMP 249 Object-Oriented Programming II (3.5) COMP 335 Introduction to Theoretical Computer Science (3) COMP 346 Operating Systems (4) COMP 348 Principles of Programming Languages (3) COMP 352 Data Structures and Algorithms (3)

Rationale:

We are moving COMP 432 Machine learning from the Computer Science core to a new AI Core for Software Engineering (which also includes COMP 332 Foundations of AI). We are also changing the section title to "Computer Science Core" instead of "Computer Science Group" to be consistent with how we usually refer to required courses. (The term "group" is usually reserved for elective courses within a subject area.)

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Software Engineering Electives
Calendar Section Type: Defined group
Description of Change: Software Engineering Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering > Degree Requirements > BEng in Software Engineering

Type of Change: Defined Group Change

Present Text calendar	Proposed Text
~~16~~ **credits** Software Engineering Electives	**15 credits** Software Engineering Electives
Students in the Software Engineering program must complete at least ~~16~~ elective credits from the list of courses below: AERO 480 Flight Control Systems (3.5) AERO 482 Avionic Navigation Systems (3) COEN 320 Introduction to Real-Time Systems (3.5) COMP 333 Data Analytics (4) COMP 339 Combinatorics (3) COMP 345 Advanced Program Design with C++ (4) COMP 371 Computer Graphics (4) COMP 376 Introduction to Game Development (4) COMP 425 Computer Vision (4) COMP 426 Multicore Programming (4) COMP 428 Parallel Programming (4) COMP 433 Introduction to Deep Learning (4) COMP 438 Geometric Modelling and Processing (4) COMP 442 Compiler Design (4) COMP 444 System Software Design (4) COMP 445 Data Communication and Computer Networks (4) COMP 451 Database Design (4) COMP 465 Design and Analysis of Algorithms (3) COMP 472 Artificial Intelligence (4) COMP 473 Pattern Recognition (4) COMP 474 Intelligent Systems (4) COMP 475 Immersive Technologies (4)	Students in the Software Engineering program must complete at least 15 elective credits from the list of courses below: AERO 480 Flight Control Systems (3.5) AERO 482 Avionic Navigation Systems (3) COEN 320 Introduction to Real-Time Systems (3.5) COMP 330 Introduction to Competitive Programming and Algorithmic Problem Solving (4) COMP 333 Data Analytics (4) COMP 339 Combinatorics (3) COMP 345 Advanced Program Design with C++ (4) COMP 371 Computer Graphics (4) COMP 376 Introduction to Game Development (4) COMP 425 Computer Vision (4) COMP 426 Multicore Programming (4) COMP 428 Parallel Programming (4) COMP 433 Introduction to Deep Learning (4) COMP 434 Distributed Learning (3) COMP 438 Geometric Modelling and Processing (4) COMP 442 Compiler Design (4) COMP 444 System Software Design (4) COMP 445 Data Communication and Computer Networks (4) COMP 451 Database Design (4) COMP 465 Design and Analysis of Algorithms (3)

Present Text calendar	Proposed Text
COMP 476 Advanced Game Development (4) COMP 477 Animation for Computer Games (4) COMP 478 Image Processing (4) COMP 479 Information Retrieval and Web Search (4) COMP 498 Topics in Computer Science (3) COMP 499 Topics in Computer Science with Lab (4) SOEN 298 System Hardware Lab (1) SOEN 344 Advanced Software Architecture and Design (3) SOEN 387 Web-Based Enterprise Application Design (3) SOEN 422 Embedded Systems and Software (4) SOEN 423 Distributed Systems (4) SOEN 471 Big Data Analytics (4) SOEN 487 Web Services and Applications (4) SOEN 491 Software Engineering Project (1) SOEN 498 Topics in Software Engineering (3) SOEN 499 Topics in Software Engineering with Lab (4) ENGR 411 Special Technical Report (1) Electives are also listed in the following groups to facilitate the selection of courses in a particular area of the field: Artificial Intelligence Group: Software Engineering Computer Games Group: Software Engineering Data Engineering Group: Software Engineering Real-Time, Embedded, and Avionics Software Group: Software Engineering Web Services and Applications Group: Software Engineering	COMP 472 Symbolic Artificial Intelligence (4) COMP 473 Pattern Recognition (4) COMP 474 Intelligent Systems (4) COMP 475 Immersive Technologies (4) COMP 476 Advanced Game Development (4) COMP 477 Animation for Computer Games (4) COMP 478 Image Processing (4) COMP 479 Information Retrieval and Web Search (4) COMP 498 Topics in Computer Science (3) COMP 499 Topics in Computer Science with Lab (4) SOEN 298 System Hardware Lab (1) SOEN 344 Advanced Software Architecture and Design (3) SOEN 387 Web-Based Enterprise Application Design (3) SOEN 422 Embedded Systems and Software (4) SOEN 423 Distributed Systems (4) SOEN 471 Big Data Analytics (4) SOEN 472 Generative Artificial Intelligence for Software Engineering (4) SOEN 473 Automated Program Analysis and Program Synthesis (3) SOEN 474 AI-Driven Software Improvement and Repair (4) SOEN 487 Web Services and Applications (4) SOEN 491 Software Engineering Project (1) SOEN 498 Topics in Software Engineering (3) SOEN 499 Topics in Software Engineering with Lab (4) ENGR 411 Special Technical Report (1) Electives are also listed in the following groups to facilitate the selection of courses in a particular area of the field: Artificial Intelligence Group: Software Engineering Computer Games Group: Software Engineering Data Engineering Group: Software Engineering Real-Time, Embedded, and Avionics Software Group: Software Engineering Web Services and Applications Group: Software Engineering

Rationale:

The total credit weight is being changed from 16 to 15 credits as part of a change to add a new AI Core to the Software Engineering program (see program change submitted concurrently).

We are adding several new courses (COMP 330, COMP 434, SOEN 472, SOEN 473, SOEN 474) to the list of Software Engineering electives as they are appropriate for this program. (See new course proposals submitted concurrently.)

The title of COMP 472 is updated (see course change submitted concurrently).

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: Artificial Intelligence Group: Software Engineering
Calendar Section Type: Defined group
Description of Change: Software Engineering Electives - AI Group

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.9 Degree Requirements for the BEng in Software Engineering > Software Engineering Elective Course Groups

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
Artificial Intelligence Group: Software Engineering	**credits**	Artificial Intelligence Group: Software Engineering
COMP 425 Computer Vision (4) COMP 433 Introduction to Deep Learning (4) COMP 472 Artificial Intelligence (4) COMP 473 Pattern Recognition (4) COMP 474 Intelligent Systems (4) COMP 479 Information Retrieval and Web Search (4)		COMP 425 Computer Vision (4) COMP 433 Introduction to Deep Learning (4) COMP 434 Distributed Learning (3) COMP 472 Symbolic Artificial Intelligence (4) COMP 473 Pattern Recognition (4) COMP 474 Intelligent Systems (4) COMP 479 Information Retrieval and Web Search (4)

Rationale:
We are adding COMP 434 Distributed Learning (new course proposal submitted concurrently) to the AI Group of electives as it is relevant to this group.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: COMP 330
Calendar Section Type: Course
Description of Change: COMP 330 - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Computer Science Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	COMP 330 Introduction to Competitive Programming and Algorithmic Problem Solving (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: COMP 249 .
Description :	*Description :* This course explores the relationships between problems and algorithms in a bottom-up fashion focusing on the problem solving process and strategies through deliberate practice. The course visits the most common paradigms used in programming competitions: dynamic programming, graph theory, string manipulation, number theory and geometric problems. The course also presents information about how major programming competitions work and simulates environments similar to those competitions.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under COMP 499 may not take this course for credit.

Rationale:

We creating a new permanent course that has been offered under COMP 499 (Topics in Computer Science with Lab).

This course will be listed in the Software Engineering Electives (program change submitted concurrently).

Enrolment history (undergrad only): Fall 2024: 27 | Fall 2025: 21 | Winter 2026: 40

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: COMP 332
Calendar Section Type: Course
Description of Change: COMP 332 - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Computer Science Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	COMP 332 Foundations for Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: COMP 232 , COMP 249 ; COMP 233 or ENGR 371 or equivalent.
Description :	*Description :* This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence (AI) and Machine Learning (ML), with an emphasis on implementation. Students develop core programming skills and learn to use numerical and tensor libraries to express linear algebra operations and high-performance tensor computations, including indexing, broadcasting, vectorization, and GPU-enabled execution. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue / Singular Value Decomposition (SVD) intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance/correlation, entropy, and Kullback-Leibler (KL) divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train/validation/test methodology, performance metrics, model development, and experiment tracking tools.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:

The objective of this course is to introduce the concepts of modern AI to Computer Science and Software Engineering students.

This course will be a core course in the BCompSc and Software Engineering programs (program changes submitted concurrently.)

Resource Implications:
None. This will be part of the normal teaching load of an instructor in the Department.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: COMP 432
Calendar Section Type: Course
Description of Change: COMP 432

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Computer Science Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
COMP 432 Machine Learning (4 credits)	COMP 432 Machine Learning (4 credits)
Prerequisites:	*Prerequisites:*
The following course must be completed previously: COMP ~~352~~ .	The following course must be completed previously: COMP 332 .
Description :	*Description :*
This course introduces conceptual and practical aspects of machine learning. Concepts include regression, classification, maximum likelihood estimation, discriminative vs. generative modelling, generalization, supervised learning, unsupervised learning, semi-supervised learning and transfer learning. Methods include linear models, mixture models, nearest neighbours, support vector machines, random forests, boosting, and basics of deep learning. A project is required.	This course introduces conceptual and practical aspects of machine learning. Concepts include regression, classification, maximum likelihood estimation, discriminative vs. generative modelling, generalization, supervised learning, unsupervised learning, semi-supervised learning and transfer learning. Methods include linear models, mixture models, nearest neighbours, support vector machines, random forests, boosting, and basics of deep learning. A project is required.
Component(s):	*Component(s):*
Lecture (3 hours per week) ; Laboratory (2 hours per week)	Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:
New course COMP 332 Foundations for AI is the foundation for Machine Learning so is being made the prerequisite for COMP 432 Machine Learning. COMP 352 Data Structures and Algorithms is being removed as the prerequisite because it is no longer required. Statistical background (covered in COMP 332) is more important than CS search algorithms.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: COMP 433
Calendar Section Type: Course
Description of Change: COMP 433

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Computer Science Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
COMP 433 Introduction to Deep Learning (4 credits)	COMP 433 Introduction to Deep Learning (4 credits)
Prerequisites:	*Prerequisites:*
The following ~~course~~ must be completed ~~previously:~~ COMP ~~352~~ .	The following courses must be completed previously or concurrently: COMP 432 .
Description :	*Description :*
This course introduces conceptual and practical aspects of deep learning and their implementation in software. Topics covered include commonly used deep learning model architectures, loss functions, regularization, optimization methods, and a strong emphasis is placed on review of their foundations and use of software tools such as pytorch, jax, and tensorflow to implement and/or apply these models. Applications in computer vision and natural language processing are covered. A final project is required.	This course introduces conceptual and practical aspects of deep learning and their implementation in software. Topics covered include commonly used deep learning model architectures, loss functions, regularization, optimization methods, and a strong emphasis is placed on review of their foundations and use of software tools such as pytorch, jax, and tensorflow to implement and/or apply these models. Applications in computer vision and natural language processing are covered. A final project is required.
Component(s):	*Component(s):*
Lecture (3 hours per week) ; Laboratory (2 hours per week)	Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:
COMP 432 Machine Learning is needed concurrently or before so that students can fully appreciate deep learning (DL). The material covered in COMP 352 (Data Structures and Algorithms) is not needed (COMP 432 is a more relevant prerequisite).

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: COMP 434
Calendar Section Type: Course
Description of Change: COMP 434 - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Computer Science Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	COMP 434 Distributed Learning (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: COMP 433 or permission of instructor.
Description :	*Description :* This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods are also studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students engage critically with current research through regular readings and presentations of recent papers. A final project is also required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:

We are converting a graduate course to a permanent course (COMP 6802) and creating COMP 434 as a cross-listed undergraduate version of the course. (The graduate students have extra work as described in the outline.)

This course will be listed in the BCompSc and Software Engineering electives (program changes submitted concurrently). It will improve both

the Software Engineering and Computer Science options in AI for students.

Enrolment history (graduate course): Winter 2023: 20 | Fall 2024: 12 | Winter 2025: 15

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: COMP 472
Calendar Section Type: Course
Description of Change: COMP 472

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Computer Science Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
COMP 472 Artificial Intelligence (4 credits)	COMP 472 Symbolic Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:*
The following course must be completed previously: COMP 352 or COEN 352 .	The following course must be completed previously: COMP 352 or COEN 352 .
Description :	*Description :*
This course ~~initially~~ describes the scope and history of Artificial Intelligence. ~~Then it~~ covers ~~knowledge representation,~~ heuristic search, game ~~playing~~ and ~~planning. Finally, it introduces the topics of machine learning, genetic algorithms~~ and ~~natural language processing.~~ A project is required.	This course describes the scope and history of Artificial Intelligence. It covers symbolic approaches to artificial intelligence including: heuristic search, game playing, knowledge representation and automated reasoning, planning, and techniques to deal with uncertainly. Finally, AI ethical issues are discussed. A project is required.
Component(s):	*Component(s):*
Lecture (3 hours per week) ; Laboratory (2 hours per week)	Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:
Since AI has become a diverse area, we are changing the title and description to make it clear that this course covers symbolic AI.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: SOEN 341
Calendar Section Type: Course
Description of Change: SOEN 341

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Software Engineering Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
SOEN 341 Software Process and Practices (4 credits)	SOEN 341 Software Process and Practices (4 credits)
Prerequisites:	*Prerequisites:*
The following courses must be completed previously or concurrently: COMP 352 or COEN 352 ; ENCS 282 .	The following courses must be completed previously or concurrently: COMP 352 or COEN 352 ; ENCS 282 .
Description :	*Description :*
This course covers the ~~following topics: basic~~ principles of software ~~engineering; introduction to~~ software ~~process,~~ including activities, phases, organization, roles, teamwork, and conflict ~~resolution;~~ notations used in software engineering; software development practices, including documentation, modern version control, review, testing, ~~agile,~~ and continuous integration.	This course covers the fundamental principles of software engineering and introduces software processes, including activities, phases, organization, roles, teamwork, and conflict resolution. Topics include requirements engineering, such as requirements elicitation, analysis, specification, and validation; notations used in software engineering; and software development practices, including documentation, modern version control, review, testing, agile methods, and continuous integration. The course includes a team-based, project-oriented component in which students apply agile practices across the software development lifecycle.
Component(s):	*Component(s):*
Lecture (3 hours per week) ; Tutorial (1 hour per week) ; Laboratory (2 hours per week)	Lecture (3 hours per week) ; Tutorial (1 hour per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses : Students who have received credit for COMP 354 may not take this course for credit.	**Equivalent Courses :** Students who have received credit for COMP 354 may not take this course for credit.
Anti-requisite Programs : Students in the BCompSc program may not take this course for credit.	**Anti-requisite Programs :** Students in the BCompSc program may not take this course for credit.

Rationale:
We are changing the description as suggested by instructors to modernize content and ensure engineering design and requirements.

Resource Implications:
None.

D34

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: SOEN 342
Calendar Section Type: Course
Description of Change: SOEN 342 - deletion

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Software Engineering Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~SOEN 342 Software Requirements and Deployment (3 credits)~~	
Prerequisites:	*Prerequisites:*
~~The following course must be completed previously: SOEN 341 .~~	
Description :	*Description :*
~~This course covers the following topics: requirements engineering; eliciting and coping with changing and evolving requirements; deployment of a software system under real-life functional and non-functional requirements scenarios; understanding how requirements impact early-stage and deployed software systems through all phases of engineering, including design, implementation, test and verification, deployment, and evolution. A project is required.~~	
Component(s):	*Component(s):*
~~Lecture (3 hours per week) ; Tutorial (1 hour per week)~~	
Notes :	*Notes :*

Rationale:

Discussion during our Continual Improvement Process meetings and from student feedback determined that this course is redundant given the content of SOEN 341 Software Process and Practices and SOEN 343 Software Architecture and Design. The course is therefore being deleted.

Impact:

- SOEN 343: A course change is being submitted concurrently to remove SOEN 342, where it is currently listed in the prerequisites.
- Software Engineering Core: A program change is being submitted concurrently to remove SOEN 342 from this list (among other changes.)
- Aerospace Engineering Option C Electives and Computer Engineering Electives: Program changes are being submitted concurrently to remove SOEN 342 from these lists.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: SOEN 343
Calendar Section Type: Course
Description of Change: SOEN 343

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Software Engineering Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
SOEN 343 Software Architecture and Design (4 credits)	SOEN 343 Software Architecture and Design (4 credits)
Prerequisites:	*Prerequisites:*
The following ~~courses~~ must be completed previously or concurrently: SOEN 341 ~~; SOEN 342~~ .	The following course must be completed previously or concurrently: SOEN 341 .
Description :	*Description :*
This course covers the following topics: from requirements to design to implementation; planned vs. evolutionary design and refactoring; model-driven design and Unified Modelling Language (UML); structural and behavioural design descriptions and specifications; general and domain-specific design principles, patterns and idioms; introduction to software architecture (styles and view models); design quality; architectural debt; design smells; refactoring Anti-Patterns to Patterns; design rationale.	This course covers the following topics: from requirements to design to implementation; planned vs. evolutionary design and refactoring; model-driven design and Unified Modelling Language (UML); structural and behavioural design descriptions and specifications; general and domain-specific design principles, patterns and idioms; introduction to software architecture (styles and view models); design quality; architectural debt; design smells; refactoring Anti-Patterns to Patterns; design rationale.
Component(s):	*Component(s):*
Lecture (3 hours per week) ; Tutorial (1 hour per week) ; Laboratory (2 hours per week)	Lecture (3 hours per week) ; Tutorial (1 hour per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:
SOEN 342 Software Requirements and Deployment is being deleted (see course change submitted concurrently), so it must be removed from the prerequisites (SOEN 341 Software Process and Practices is sufficient preparation.)

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: SOEN 472
Calendar Section Type: Course
Description of Change: SOEN 472 - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Software Engineering Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	SOEN 472 Generative Artificial Intelligence for Software Engineering (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: SOEN 341 or COMP 354 .
Description :	*Description :* This course introduces key concepts about using Generative AI (GenAI) in software engineering practice and research. The course includes sessions on the topics of prompt engineering and fine-tuning Large Language Models for software engineering research. Subsequently, the course focuses on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, the course covers special topics related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of GenAI. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*

Rationale:

We are converting a graduate-level course in Generative AI for Software Engineering to a permanent course, offering both a graduate and undergraduate version (cross-listed). This course proposal is the undergraduate version.

This will be listed as an elective in the BCompSc and Software Engineering programs (program changes submitted concurrently).

Enrolment history (SOEN 691 with this topic): Winter 2024: 39 | Winter 2025: 38 | Winter 2026: 17

Resource Implications:
None. This will be part of the normal teaching load of an instructor in the Department.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: SOEN 473
Calendar Section Type: Course
Description of Change: SOEN 473 - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Software Engineering Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	SOEN 473 Automated Program Analysis and Program Synthesis (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: SOEN 341 or COMP 354 .
Description :	*Description :* This course introduces key program analysis techniques in automated debugging (such as delta debugging and statistical fault localization) and automated program repair (such as genetic improvement and template-based approach). Topics include algorithms of existing debugging techniques, control-flow and data-flow analysis, improving quality of auto-generated code, and test-driven program repair. After learning the basic program analysis techniques, the emerging AI-assisted techniques that use program analysis are discussed and presented. Students work in a team for a course project where students improve existing program analysis tools by fixing bugs listed in the open-source GitHub repositories.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:

We are creating a cross-listed undergraduate (SOEN 473) and graduate course (SOEN 6131) after offering the course under SOEN 691 Topics in Software Engineering.

This will be listed in the electives in the BCompSc and Software Engineering programs.

Enrolment history (graduate course, offered under SOEN 691): Winter 2024: 15 | Fall 2025: 11

Resource Implications:
None. This course will be part of the normal teaching load of an instructor in the Department.

COURSE CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: BCompSc and Software Eng changes (2027-28)

Calendar Section Name: SOEN 474
Calendar Section Type: Course
Description of Change: SOEN 474 - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.10 Computer Science and Software Engineering Courses > Software Engineering Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	SOEN 474 AI-Driven Software Improvement and Repair (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: SOEN 341 or COMP 354 .
Description :	*Description :* This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*

Rationale:

We are creating a cross-listed undergraduate (SOEN 474) and graduate course (SOEN 6141) after offering the course under SOEN 691 Topics in Software Engineering.

This will be listed in the electives in the BCompSc and Software Engineering programs.

Enrolment history (graduate course, offered under SOEN 691): Winter 2021: 10 | Fall 2022: 13 | Winter 2024: 4 | Winter 2025: 15 | Fall 2025: 15

Resource Implications:
None. This course will be part of the normal teaching load of an instructor in the Department.

Impact Report

Programs

BCompSc in Computer Science
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc) -> Degree Requirements
Source of Impact

- Artificial Intelligence Electives
- Computer Science Electives

BEng in Software Engineering
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering -> Degree Requirements
Source of Impact

- Computer Science Group: Software Engineering
- Software Engineering Core
- Software Engineering Electives

Joint Major in Data Science
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.85 Data Science -> BCompSc Joint Major in Data Science -> Degree Requirements
Source of Impact

- Computer Science Electives

Minor in Computer Science
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.5 Minor in Computer Science -> Degree Requirements
Source of Impact

- Computer Science Electives

Defined Groups

Artificial Intelligence Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc) -> Degree Requirements -> BCompSc in Computer Science
Source of Impact

- Artificial Intelligence Group: BCompSc

Artificial Intelligence Group: BCompSc
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of

Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc) -> Computer Science Elective Course Groups
Source of Impact

- COMP 432
- COMP 433
- COMP 472

Artificial Intelligence Group: Software Engineering
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering -> Software Engineering Elective Course Groups
Source of Impact

- COMP 433
- COMP 472

BCompSc - Option in AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc)
Source of Impact

- Artificial Intelligence Group: BCompSc
- COMP 432
- COMP 433
- Computer Science Electives

Computer Engineering Core
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.30 Department of Electrical and Computer Engineering -> Section 71.30.2 Course Requirements (BEng in Computer Engineering) -> Degree Requirements -> BEng in Computer Engineering
Source of Impact

- SOEN 341

Computer Engineering Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.30 Department of Electrical and Computer Engineering -> Section 71.30.2 Course Requirements (BEng in Computer Engineering) -> Degree Requirements -> BEng in Computer Engineering
Source of Impact

- Software and System Design Electives: Computer Engineering

Computer Science Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc) -> Degree Requirements -> BCompSc in Computer Science
Source of Impact

- Artificial Intelligence Group: BCompSc

Computer Science Group: Software Engineering

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering -> Degree Requirements -> BEng in Software Engineering
Source of Impact

- COMP 432

Computer Science and Programming Electives: Computer Engineering
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.30 Department of Electrical and Computer Engineering -> Section 71.30.2 Course Requirements (BEng in Computer Engineering) -> Degree Requirements -> BEng in Computer Engineering -> Computer Engineering Electives
Source of Impact

- COMP 472

Computer Systems Electives: Electrical Engineering
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.30 Department of Electrical and Computer Engineering -> Section 71.30.1 Course Requirements (BEng in Electrical Engineering) -> Degree Requirements -> BEng in Electrical Engineering -> Electrical Engineering Electives
Source of Impact

- SOEN 341

Course Requirements for Honours Programs
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.4 Honours Program
Source of Impact

- Computer Science Electives

Data Analytics Group: BCompSc
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc) -> Computer Science Elective Course Groups
Source of Impact

- COMP 432

Data Analytics for Chemical Engineers
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.105 Department of Chemical and Materials Engineering -> Section 71.105.1 Course Requirements (BEng in Chemical Engineering) -> Degree Requirements -> BEng in Chemical Engineering -> Chemical Engineering Technical Elective Courses
Source of Impact

- COMP 433

Data Science Courses
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.85 Data Science -> BCompSc Joint Major in Data Science -> Degree Requirements -> Joint Major in Data Science
Source of Impact

- COMP 432
- COMP 433

Engineering Core
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.20 BEng -> Section 71.20.5 Degree Requirements
Source of Impact

- BEng in Software Engineering

General Electives: BCompSc
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc) -> Degree Requirements -> BCompSc in Computer Science
Source of Impact

- Computer Science Electives
- General Electives Exclusion List

Health and Life Sciences Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.75 Computer Science in Health and Life Sciences -> Section 71.75.1 Curriculum for the Degree of BCompSc in Health and Life Sciences -> Section 71.75.2 Degree Requirements -> BCompSc in Health and Life Sciences
Source of Impact

- COMP 472

List of Available and Approved COMP/COEN Courses
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 31 Faculty of Arts and Science -> Faculty of Arts and Science -> Section 31.030 Department of Biology -> Biology Programs -> Systems and Information Biology -> Systems and Information Biology Program Modules and Course Lists
Source of Impact

- COMP 472

Mathematics and Statistics Course Requirements
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 31 Faculty of Arts and Science -> Faculty of Arts and Science -> Section 31.200 Department of Mathematics and Statistics -> Mathematics and Statistics Programs -> Data Science -> BA/BSc Joint Major in Data Science -> Program Requirements -> Joint Major in Data Science
Source of Impact

- COMP 432
- COMP 433

Option C — Avionics and Aerospace Systems
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.55 Aerospace Engineering -> Course Requirements (BEng in Aerospace Engineering) -> Degree Requirements -> BEng in Aerospace Engineering -> Aerospace Engineering Option Requirements
Source of Impact

- Option C — Avionics and Aerospace Systems Electives

Option C — Avionics and Aerospace Systems Core
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.55 Aerospace Engineering -> Course Requirements (BEng in Aerospace Engineering) -> Degree Requirements -> BEng in Aerospace Engineering -> Aerospace Engineering Option Requirements -> Option C — Avionics and Aerospace Systems
Source of Impact

- SOEN 341

Option C — Avionics and Aerospace Systems Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.55 Aerospace Engineering -> Course Requirements (BEng in Aerospace Engineering) -> Degree Requirements -> BEng in Aerospace Engineering -> Aerospace Engineering Option Requirements -> Option C — Avionics and Aerospace Systems
Source of Impact

- SOEN 342
- SOEN 343

Software Engineering - AI Core (new)
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering -> Degree Requirements -> BEng in Software Engineering
Source of Impact

- COMP 432

Software Engineering Core
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering -> Degree Requirements -> BEng in Software Engineering
Source of Impact

- SOEN 341
- SOEN 342
- SOEN 343

Software Engineering Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering -> Degree Requirements -> BEng in Software Engineering
Source of Impact

- Artificial Intelligence Group: Software Engineering
- COMP 433
- COMP 472

Software and System Design Electives: Computer Engineering
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering

and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.30 Department of Electrical and Computer Engineering -> Section 71.30.2 Course Requirements (BEng in Computer Engineering) -> Degree Requirements -> BEng in Computer Engineering -> Computer Engineering Electives
Source of Impact

- SOEN 342
- SOEN 343

Courses

COEN 330
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.60 Engineering Course Descriptions -> Computer Engineering Courses
Source of Impact

- COMP 432

COEN 421
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.60 Engineering Course Descriptions -> Computer Engineering Courses
Source of Impact

- SOEN 341

COEN 448
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.60 Engineering Course Descriptions -> Computer Engineering Courses
Source of Impact

- SOEN 341

COEN 490
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.60 Engineering Course Descriptions -> Computer Engineering Courses
Source of Impact

- SOEN 341

COMP 330 - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Computer Science Courses
Source of Impact

COMP 332 - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Computer Science Courses
Source of Impact

COMP 353
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering

and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Computer Science Courses
Source of Impact

- BEng in Software Engineering

COMP 354
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Computer Science Courses
Source of Impact

- SOEN 341

COMP 434 - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Computer Science Courses
Source of Impact

- COMP 433

COMP 6321
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

- COMP 432

COMP 6721
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

- COMP 472

COMP 6861
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

- COMP 432

SOEN 342
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

SOEN 343
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341
- SOEN 342

SOEN 344
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 343

SOEN 345
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 343

SOEN 357
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

SOEN 384
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

SOEN 387
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

SOEN 472 - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

SOEN 473 - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

SOEN 474 - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.10 Computer Science and Software Engineering Courses -> Software Engineering Courses
Source of Impact

- SOEN 341

STAT 380
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 31 Faculty of Arts and Science -> Faculty of Arts and Science -> Section 31.200 Department of Mathematics and Statistics -> Department of Mathematics and Statistics Courses -> Statistics Courses
Source of Impact

- COMP 432

STAT 385
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 31 Faculty of Arts and Science -> Faculty of Arts and Science -> Section 31.200 Department of Mathematics and Statistics -> Department of Mathematics and Statistics Courses -> Statistics Courses
Source of Impact

- COMP 433

Regulations

Accelerated Career Experience Option
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.20 BEng -> Section 71.20.8 C.Edge (Career Edge) and Accelerated Career Experience Options
Source of Impact

- BEng in Software Engineering

C.Edge Option
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering

and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.20 BEng -> Section 71.20.8 C.Edge (Career Edge) and Accelerated Career Experience Options
Source of Impact

- BEng in Software Engineering

Degree Requirements
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.2 Degree Requirements (BCompSc)
Source of Impact

- Artificial Intelligence Electives
- Computer Science Electives

Degree Requirements
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Section 71.70.9 Degree Requirements for the BEng in Software Engineering
Source of Impact

- Computer Science Group: Software Engineering
- Software Engineering Core

Objectives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.70 Department of Computer Science and Software Engineering -> Department of Computer Science and Software Engineering
Source of Impact

- BEng in Software Engineering

Programs
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.20 BEng -> Section 71.20.1 Curriculum for the Degree of BEng
Source of Impact

- BEng in Software Engineering

The Co-operative Format
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.10 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.10.8 Co-operative Education in the Gina Cody School of Engineering and Computer Science
Source of Impact

- BEng in Software Engineering

The following programs are offered in the Gina Cody School of Engineering and Computer Science:
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.10 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.10.1 Programs Offered
Source of Impact

- BEng in Software Engineering

Other Units

Addition of **ENGR 371** to **COMP 332** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 6802** to **COMP 434** requirement
Source of other unit Impact

- Course is housed in Computer Science and Software Engineering Courses

Addition of **SOEN 6121** to **SOEN 472** requirement
Source of other unit Impact

- Course is housed in Computer Science and Software Engineering Courses

COMP330
Introduction to Competitive Programming and Algorithmic Problem Solving
Fall 2027

Course Instructor:
Dr. Denis Pankratov - denis.pankratov@concordia.ca
Dr. Tiberiu Popa - tiberiu.popa@concordia.ca

Office Hours:
TBA

Tutorials: Please see your class schedule for details
N/A

Labs: Please see your class schedule for details
Lab Demonstrators: *TBA*

Course Calendar Description:
This course explores the relationships between problems and algorithms in a bottom-up fashion focusing on the problem solving process and strategies through deliberate practice. The course visits the most common paradigms used in programming competitions: dynamic programming, graph theory, string manipulation, number theory and geometric problems. The course also presents information about how major programming competitions work and simulates environments similar to those competitions.

Prerequisites: *COMP 249*

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here

- Basic programming skills in C/C++ or Java or Python

Course materials
Required Textbook: N/A.

Grading Scheme

Component	% of the grade – option A	% of the grade – option B
Simulated programming competitions	*80*	*50*
Participation	*10*	*10*

Codebook	*10*	*10*
Final exam	*0*	*30*

•. You can choose from option A or option B (**which means that the final exam is not mandatory**) by a date specified by the instructors. If a choice is not made by the deadline, option A is assumed by default.

- The programming competitions will be held in person in the University computer labs during the lab time slot. 7 labs will be reserved for simulated individual programming competitions. **These labs will be mentioned in the first week of class.**

- Every lab exam will be 90min long and will contain two problems: X and Y. A problem is solved correctly if it passes ALL test cases, included the ones unknown to the students. Partial marks may be awarded if a problem is not solved correctly. If a student solves correctly problem X they receive an 80% grade, if they solve problem Y they receive 100% and if they solve both correctly they receive 115% (A bonus is awarded ONLY if both problems are solved correctly). If one or none of the problems is solved correctly the grade will be the maximum of the grade awarded for each problem: max((#passed cases problem X/ # total cases problem X)*80%, (#passed cases problem Y/ # total cases problem Y) * 100%)

- **There will be no examination of the code except for plagiarism check.**

- The entire Simulated programming competition grade will be calculated as the average of all lab results. **We reserve the right to cancel an entire lab result if we encounter technical glitches or we suspect academic misconduct. In such cases the lab would be removed from the list and the grading formula is applied only to the rest of the labs**.

- **The competition labs are mandatory except on medical grounds in which case a doctor note is required. In such cases, the lab is removed from the list of competition labs and the same grading formula is applied to the remainder of the labs.**

- The final exam will consist of a 3h competition with extra partial grades awarded by analyzing and explaining the submitted code.

Tentative Course Schedule

Week	Description	Labs / Goals
Week 1 Prof. Popa	Course administration. Class format and objectives. Welcome to Domjudge, creating userids and teams.	No Labs.

	Programming environment and the language of your choice. Simple I/O. About the codebook. How to read a problem and the workflow of solving it. Solving together a problem	
Week 2 Prof. Pankratov	The most important tool, in the programming quiver: Dynamic programming (1/3)	Choose your language of choice and the programming environment Log in to DomJudge Figure out the I/O formatting Practice competition: PRACTICE
Week 3 Prof. Popa	Number Theory	Practice Competition: PC3 (DP)
Week 4 Prof. Pankratov	The most important tool, in the programming quiver: Dynamic programming (2/3)	Practice Competition: PC4 (number theory and logic)
Week 5 Prof. Pankratov	The most important tool, in the programming quiver: Dynamic programming (3/3)	**Simulated Competition SC5 (DP)**
Week 6 Prof. Popa	The most important data modeling tool: Graphs (1/3)	**Simulated Competition SC6 (DP)**
Week	Reading week	
Week 7 Prof. Popa	The most important data modeling tool: Graphs (2/3)	**Simulated Competition SC7 (Graphs)**
Week 8 Prof. Popa	The most important data modeling tool: Graphs (3/3)	**Simulated Competition SC8 (Graphs)**
Week 9	Logic problems (1/2)	**Simulated Competition SC9 (DP/Graphs)**

Prof. Pankratov		
Week 10 Prof. Pankratov	Logic problems (2/2)	**Simulated Competition SC10 (Logic)**
Week 11 Prof. Pankratov	Geometric Problems	**Simulated Competition SC11 (Logic/Number Theory)**
Week 12 Prof. Popa	Strings	No Labs

Lab Details

You may include a list of lab trainings and names of experiments here.

See above

Engineering Tools

Insert engineering tools introduced/utilized in the course here.

N/A

Details on assessment tools: TBD

Other information

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

If your course has additional information about health and safety guidelines/training, please insert them here.

On Campus Resources

Please visit Student services at Concordia University for the services available Gina Cody School students.

COMP 332
Foundations for AI
Computer Science and Software Engineering (CSSE)
Fall 2027

Course Instructor:
Insert full name here (TBD)
Insert e-mail address here (TBD)

Office Hours:
Insert office hours Days – Time – Location here (TBD)

Tutorial/Labs: Please see your class schedule for details (TBD)
Lab Demonstrators: (TBD)

Course Calendar Description:
This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence and Machine Learning, with an emphasis on implementation. Students develop core programming skills and learn to use numerical and tensor libraries to express linear algebra operations and high-performance tensor computations, including indexing, broadcasting, vectorization, and GPU-enabled execution. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue/SVD intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance/correlation, entropy, and KL divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train/validation/test methodology, performance metrics, model development, and experiment tracking tools.

Prerequisites: The following courses must be completed previously: COMP 232; COMP 249; COMP 233 or ENGR 371 or equivalent.

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

It is expected that you possess the following basic knowledge
1. Calculus mathematics
2. Statistics and probabilities
3. Programming skills including object-oriented programming

Course materials
Required Textbook: There is no specific textbook for this course. There will be a series of papers, course slides, reports, GitHub repositories which will be assigned during the lecture for reading and preparation.

Grading Scheme
Grades will be based on three different modules including midterm/final exams, course project, and lab assignments.
Exams: 70%
Project: 15%
Labs and Assignments: 15%

Tentative Course Schedule
Lectures: two and half hours per week.

Lecture 1: Introduction to Python for Scientific Computing
Introduction to Python, data structures (lists, tuples, sets, dictionaries), data processing libraries (PIL, Pandas/DataFrame, NLTK), lists of objects, error handling, visualization (Matplotlib), Jupyter notebooks, Python environment management (conda/venv, pip, dependency pinning, GPU/CUDA installation notes).

Lecture 2: Linear Algebra and Tensor Libraries
Basic vector–matrix multiplication and elementwise operations, eigenvalues and singular value decomposition (SVD), determinant and matrix inversion, norms, dot product and inner product (Hilbert) spaces, implementation using NumPy and PyTorch, reference to the Linear Algebra chapter of the Deep Learning book.

Lecture 3: Advanced Tensor Libraries
Indexing, broadcasting, CPU/GPU computation, device placement (CPU/CUDA), batching, memory management, mixed precision, vectorization (converting iterative for-loop computations to tensor operations), PyTorch demonstrations and exercises.

Lectures 4–5: Gradient Analysis I & II
Single-variable derivatives, single-variable minimization and maximization problems with exercises, partial derivatives for multivariable functions, differentiation rules, chain rule, gradients and matrix-based views of gradients (Stanford reference), gradient computation demonstrations using PyTorch.

Lecture 6: Gradient Descent
Objective functions for minimization, non-stochastic gradient descent calculations, reference to Chapter 4 of the Deep Learning book, PyTorch function examples and implementations.

Lecture 7: Constrained Optimization
Lagrange multipliers, equality and inequality constraints including KKT conditions, exercises.

Lectures 8–9: Probability and Statistics I & II
Expectation, probability density functions, Gaussian distribution and the Central Limit Theorem, random variable transformations, Kullback–Leibler (KL) divergence, entropy, covariance and correlation, statistical significance and hypothesis testing, sampling, PyTorch-based simulations of all topics, reference to the Probability and Information Theory chapter of the Deep Learning book.

Lecture 10: Reproducibility in Machine Learning
Random seeds and reproducibility, PyTorch demonstrations and exercises, reference to Chapter 4 of the Deep Learning book.

Lectures 11–12: Machine Learning Pipeline Implementation I & II
Training, validation, and test splits, performance metrics, end-to-end workflows using PyTorch Lightning (DataLoader, training, fitting, prediction, visualization), monitoring and experiment tracking (e.g., Weights & Biases).

Lab Details
The lab material are aligned with the course lecture topics for Python coding including but not limited to numpy, pandas, PIL, DataFrame, NTLTK, Matplotlib, scikit learn, pytorch

Engineering Tools
numpy, pandas, PIL, DataFrame, NTLTK, Matplotlib, scikit learn, pytorch

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following science engineering concepts.
(1) familiarization with and fully understanding the mathematical foundations behind Artificial Intelligence (AI) algorithms and models designs
(2) familiarization with popular libraries and toolkits used in machine learning and deep learning
(3) basic implementation and understanding of machine learning pipelines and how they operate in different downstream applications.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

If your course has additional information about health and safety guidelines/training, please insert them here.

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

COMP 434
Distributed Learning
Computer Science and Software Engineering
Winter 2028

Course Instructor:
Eugene Belilovsky
Eugene.belilovsky@concordia.ca

Office Hours:
Insert office hours Days – Time – Location here

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:
This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods are also studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students engage critically with current research through regular readings and presentations of recent papers. A final project is also required.

Prerequisites: *COMP 433 or permission of instructor*
Co-requisites: *N/A*
Crosslisted course: The final project will have different requirements, assignments and exams will have a few questions that are only for graduate students

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

COMP 433 and its pre-requisites well cover the requirements

Grading Scheme

Insert your grading scheme here.

15% Assignments
35% Exams
30% Project
20% Presentations

Tentative Course Schedule
Insert course schedule here

Week 1 : Introduction: Gradient Descent, Distributed Data Parallelism

Week 2 : Communication-Efficient Data Parallelism: Gossip, Local SGD, Communication Compression

Week 3: Federated Learning: Client Drift, Heterogeneity, Privacy, Personalization

Week 4 : Theoretical Analysis of Distributed Optimization

Week 5 : Model Parallelism 1: Pipelining, Tensor Parallelism, Context Parallelism

Week 6 : Model Parallelism 2: Sharded Parallelism, Implementations

Week 7 : Asynchrony and Communication Overlap

Week 8 : Recent Advances Federated Learning

Week 9 : Recent Advances Decentralized Learning

Week 10 : Recent Advances in Model Parallelism

Week 11 : Recent Advances in Asynchronous Methods

Week 12 : Final Project Presentation

Details on assessment tools:
TBD

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

If your course has additional information about health and safety guidelines/training, please insert them here.

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

SOEN 472
Generative Artificial Intelligence for Software Engineering
Computer Science and Software Engineering
Winter 2028

Course Instructor:
Diego Elias Damasceno Costa
diego.costa@concordia.ca

Office Hours:
Thursdays – 15:00-16:00 – ER1231

Labs: Please see your class schedule for details
Lab Demonstrators: Kawsar Ahmed Bhuyian

Course Calendar Description:
This course introduces key concepts about using Generative AI (GenAI) in software engineering practice and research. The course includes sessions on the topics of prompt engineering and fine-tuning Large Language Models for software engineering research. Subsequently, the course focuses on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, the course covers special topics related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of GenAI. A project is required.

Laboratory. Each week, the lecture will be complemented by a 1-hour laboratory session, equipped with prepared materials to guide students in running experiments with LLMs for software engineering research.

Course project. Students will be required to work as teams on the course project. Undergraduate students will have the option to choose a more practical project: develop an LLM-based solution for software engineering practitioners and write a detailed report on the process.

***Lectures**:* three hours per week.
***Laboratories**:* one hour per week.

Prerequisites: SOEN 341 or COMP 354
Co-requisites: N/A
Crosslisted course: SOEN 6121: Graduate students will be required to complete a research project as part of their course project. Undergraduate students will be required to complete a GenAI tool/software development as part of their course project.

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Understanding of the Software Engineering lifecycle
    - Software requirements
    - Software design and development
    - Software testing and maintenance
- Basic understanding of Machine Learning
    - Training supervised machine learning models.
- Programming logic

Course materials
Required Textbook: *Huyen, C. 2024. AI Engineering: Building Applications with Foundation Models. 1st edn. O'Reilly Media, Sebastopol, CA. ISBN 978-1-098-16630-4*

Grading Scheme
Grades will be based on class participation, assignments in the form of paper critiques, lab assignments, in- class exams, and a group project involving researching the application of GenAI in Software Engineering problems. As part of the course project, students will be expected to produce a final report detailing their techniques and findings.

Deliverable	**% of final grade**
Class participation	10%
Lab Assignments	15%
Paper Reviews	15%
Quiz	20%
Course project	40%
Total	**100%**

Class Participation
Students are expected to attend all classes. In each class, we will have discussions based on the assigned readings. Students are expected to participate and make meaningful contributions to these

Lab Assignments. Each week, the lecture will be complemented by a 1-hour laboratory session, equipped with prepared materials to guide students in running experiments with LLMs for software engineering research.

Paper Critiques
In most weeks, students will be assigned one to two research papers (or chapters) to read. Each

student is expected to send a critique of one of the papers that are being presented. The critique should include a brief summary of the paper, at least three strengths of the paper and at least three weaknesses of the paper.

Course project. A large portion of the course deliverables is a course research project. You are expected to work on the course project in groups. Each group is expected to write a research paper by the end of the semester. The topic is to be determined with the instructor. Examples include a new contribution on a specific related topic, a survey paper of a related topic (typically involves surveying 30 – 60 papers) or building a tool that integrates GenAI to solve software engineering problems.

- Undergraduate students will have the option to choose a more practical project: develop an LLM-based solution for software engineering practitioners and write a detailed report on the process.

Tentative Course Schedule

The table below outlines a possible schedule for this course over a 12-week term. Slight modifications to content may occur based on the background and abilities of students.

Week(s)	Topics
1	Introduction to GenAI in Software Engineering
2	Prompt Engineering for Practitioners and Researchers
3	Embedding SE Expertise in Foundational Models (RAG, Agents)
4	Experiment Design for Software Engineering Studies with GenAI
5	GenAI applied to Software Requirements
6	GenAI applied to Software Design
7	GenAI applied to Software Development
8	GenAI applied to Software Testing
9	GenAI applied to Software Maintenance and Repair
10	Special topics: Engineering Agentic Systems
11	**Quiz**
12	**Final Project presentation**

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

- **Comprehend GenAI Foundations**. Explain the fundamental principles, capabilities, and evolution of Generative AI and Large Language Models (LLMs), specifically within the context of software engineering.
- **Apply Domain-Embedding Techniques to LLMs**. Apply specific techniques (e.g., as Prompt Engineering, RAG and Fine-tuning) to optimize off-the-shelf LLMs for domain-specific software tasks.

- **Understand the Challenges of Developing GenAI-based Systems**. Design and evaluate strategies for implementing and deploying software systems that contain GenAI components.
- **Evaluate Risks and Ethics**. Critically assess the limitations and risks associated with LLMs (e.g., non-determinism, lack of transparency/explainability) and analyze the ethical and societal implications of deploying these tools in professional practice.
- **Learn Fundamentals of SE Research**. Understand the different types of study designs, and scientific methodology for research the application of GenAI to SE tasks.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

SOEN 473
Automated Program Analysis and Program Synthesis
Department of Computer Science and Software Engineering
Terms: Fall 2027 / Winter 2028

Course Instructor:
Shin Hwei Tan
shinhwei.tan@concordia.ca

Office Hours:
Tuesday– 2.30pm-3.30pm (or by appointment) – S-ER 1121, ER Building, 2155 Guy St.

Tutorials: Please see your class schedule for details
N/A

Labs: Please see your class schedule for details
N/A

Course Calendar Description:
This course introduces key program analysis techniques in automated debugging (such as delta debugging and statistical fault localization) and automated program repair (such as genetic improvement and template-based approach). Topics include algorithms of existing debugging techniques, control-flow and data-flow analysis, improving quality of auto-generated code, and test-driven program repair. After learning the basic program analysis techniques, the emerging AI-assisted techniques that use program analysis are discussed and presented. Students work in a team for a course project where students improve existing program analysis tools by fixing bugs listed in the open-source GitHub repositories.

Prerequisites: *COMP 354 or SOEN 341*
Co-requisites: *N/A*
Crosslisted course: SOEN 6131 (Students participating in the graduate course are obliged to undertake a notably more challenging project assignment).

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

The students are required to know basic programming skills in one of the popular programming languages (Java, Python, C, C++) as they will write code to improve tools for the course project.

Course materials
Required Textbook: *N/A*

Grading Scheme
Grades will be based on one in-class presentations, one tool-demo presentation, and a group project involving automated techniques projects. As part of the course project, students will be expected to produce a final report detailing their techniques and findings. Students participating in the graduate course are obliged to undertake a notably more challenging project assignment.

Deliverable	% of final grade
Assignments	10%
Paper review	15%
Tool Demo	10%
Paper Presentation	10%
Course project	30%
In-class Discussion	10%
Quiz	15%
Total	100%

Tentative Course Schedule

The table below outlines a possible schedule for this course over a 12-week term. Slight modifications to content may occur based on the background and abilities of students. Open-source projects will be used to carry out the course project.

Week(s)	Topics
1	Course Introduction & Research 101
2	Introduction to Program Analysis & Reviewing/Presenting Papers
3	Introduction to Automated Debugging & Automated Program Repair (APR)
4	Introduction to Program Synthesis & Similar Bug Fixes
5	Presentations on Delta Debugging
6	Presentations on Statistical Fault Localization & Program Slicing
7	Progress Report Presentation
8	Presentations on Search-based Program Repair
9	Presentations on Template-based Program Repair
10	Presentations on Semantic-based Program Repair
11	Presentations on AI-based Program Repair
12	Project Presentations

Details on assessment tools: N/A

Other information

N/A

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

- *Learn different techniques of automated debugging, automated program repair and program synthesis*
- *Learn how to conduct systematic literature review for automated debugging and automated program repair*
- *Learn program analysis techniques that form the basis for automated debugging and automated program repair*
- *Evaluate existing techniques for automated debugging and automated program*

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

SOEN 474
AI-Driven Software Improvement and Repair
Computer Science and Software Engineering
Fall 2027

Course Instructor:
Dr. Jinqiu Yang
jinqiu.yang@concordia.ca
Associate Professor; Director of O-RISA lab

Office Hours:
Every Tuesday from 2-3pm. Or email me to schedule an appointment

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:
This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems.

Prerequisites: *SOEN 341 or COMP 354*
Cross-listed course: SOEN 6141(Graduate students will do an additional research project about applying AI techniques to advance automated software improvement and repair)

Specific Knowledge and Skills Needed for this Course:
Students should know to program in one of the common programming languages, e.g., Java or Python. Basic concepts on software development process, debugging and testing are required.

Course materials
Required Textbook: *N***o textbooks. The reading materials include research papers and articles.**

Grading Scheme

Items	% of final grade	Notes
Class Participation	10%	Each week, students are expected to participate in the paper discussions when applicable.
Lab assignment(s)	20%	Students are required to finish lab assignments that cover relevant

		techniques on AI-driven software improvement and repair that are taught in the course.
Course project	40%	Each group of students needs to submit an original 10-page project report in either IEEE or ACM double column format
Exam	30%	
Total	100%	

Tentative Course Schedule

Week(s)	Topics
1	Software Improvement and repair: an overview on background and history
2	Bugs, errors, and failures
3	Fault localization
4	AI-assisted fault localization
5	Automated program repair
6	History-driven and AI-assisted automated program repair
7	Benchmarks, evaluation, and reflection
8	Project proposal presentations
9	AI-driven software improvement and repair
10	Fairness and trust
11	In-class final
12	Final project presentations

Lab Details

Lab topic 1: IR-based fault localization
Lab topic 2: Classic automated program repair
Lab topic 3: Learning-based repair with LLMs
Lab topic 4: LLMs for automated software refactoring

Engineering Tools
N/A

Graduate Attributes: This is an elective course, no graduate attributes specified.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

Amber Saunders

From: Biology Chair
Sent: Sunday, April 5, 2026 6:02 AM
To: Amber Saunders
Cc: Joey Paquet; Peter Rigby; Michael Sacher; Otmane Ait Mohamed
Subject: Re: CSSE curriculum dossier | COMP 472 course change | BCompSc in Life and Health Sciences

Dear Amber. I acknowledge the change in the course title and description for COMP472.
Cheers.
Michael

Michael Sacher, PhD
Professor and Chair
Department of Biology

Get Outlook for Android

From: Amber Saunders <amber.saunders@concordia.ca>
Sent: Thursday, April 2, 2026 3:07:07 PM
To: Biology Chair <biology.chair@concordia.ca>
Cc: Joey Paquet <joey.paquet@concordia.ca>; Peter Rigby <peter.rigby@concordia.ca>; Michael Sacher <michael.sacher@concordia.ca>; Otmane Ait Mohamed <otmane.aitmohamed@concordia.ca>
Subject: CSSE curriculum dossier | COMP 472 course change | BCompSc in Life and Health Sciences

Hello Dr. Sacher,

The Department of Computer Science and Software Engineering has submitted an undergraduate curriculum dossier to APC which includes a course change for COMP 472 Artificial Intelligence to change the course title and description. I have attached the course change (extract from dossier GCS-COMP-5982).

COMP 472 is listed as an elective in the BCompSc in Health and Life Sciences. Because this program is jointly offered by CSSE and the Department of Biology, APC has asked for an email from the Department of Biology acknowledging this change, to be attached to the curriculum dossier.

Could you please review the attached course change and let me know if you have any comments or objections by noon on Tuesday, April 7th?

Amber Saunders
Facilitator, Academic Programs and Accreditation
Gina Cody School of Engineering and Computer Science | Concordia University
514-848-2424 Ext: 4936

Amber Saunders

From: Melanie Jane Hazlett
Sent: Tuesday, April 7, 2026 12:55 PM
To: Amber Saunders
Cc: Peter Rigby; Otmane Ait Mohamed
Subject: Re: Reminder: CSSE curriculum change: Impact on Chemical Engineering electives - COMP 433 course change (prerequisites)

Hi Amber,

Apologies a bit after noon... Acknowledged. We will consult about the possibility of including CHME 316 as prerequisite as suggested.

Best

Melanie

Melanie Hazlett, Ph.D., P.Eng.
Associate Professor / Professeure associée
Undergraduate Program Director / Directrice du programme de premier cycle
Department of Chemical and Materials Engineering / Département de génie chimique et des matériaux
Gina Cody School of Engineering and Computer Science / École de génie et d'informatique Gina Cody
Centre for NanoScience Research/Centre de recherche en nanosciences
Concordia University / Université Concordia
https://www.mjhazlett.com/
P: (514) 848-2424 x 3197
O: HU-212

From: Amber Saunders <amber.saunders@concordia.ca>
Sent: Tuesday, April 7, 2026 8:23 AM
To: Melanie Jane Hazlett <melanie.hazlett@concordia.ca>
Cc: Peter Rigby <peter.rigby@concordia.ca>; Otmane Ait Mohamed <otmane.aitmohamed@concordia.ca>
Subject: Reminder: CSSE curriculum change: Impact on Chemical Engineering electives - COMP 433 course change (prerequisites)

Hi Melanie,

Just a reminder to send me an email of acknowledgment by noon today.

Thanks,

Amber Saunders
Facilitator, Academic Programs and Accreditation
Gina Cody School of Engineering and Computer Science | Concordia University
514-848-2424 Ext: 4936

From: Amber Saunders
Sent: Thursday, April 2, 2026 2:26 PM
To: Melanie Jane Hazlett <melanie.hazlett@concordia.ca>
Cc: Peter Rigby <peter.rigby@concordia.ca>; Otmane Ait Mohamed <otmane.aitmohamed@concordia.ca>
Subject: CSSE curriculum change: Impact on Chemical Engineering electives - COMP 433 course change (prerequisites)
Importance: High

Hi Melanie,

As you are aware, dossiers from CSSE were presented and approved at our Undergraduate Studies Committee of January 22nd, 2026. (They were subsequently approved by Faculty Council February 20th, 2026.)

One of CSSE's dossiers included a course change for COMP 433 Introduction to Deep Learning to replace COMP 352 with COMP 432 in the prerequisites. (See attached course change.)

During their review of dossiers submitted for the APC meeting of April 14th, APC noted that COMP 433 is listed in the Chemical Engineering program, Data Analytics for Chemical Engineers technical elective group. As COMP 432 (new prerequisite) is not listed in the electives, students will not be able to take COMP 433 due to the missing prerequisite.

The solution might be for CSSE (if they agree) to add an alternative prerequisite for COMP 433 that is taken by Chemical Engineering students (e.g., CHME 316 Advanced Data Analysis and ML for Chemical Engineers).

No action is required immediately (this requires some thought and consultation), but APC has asked for an acknowledgment email from the department, to be included with the CSSE dossier. Could you please send me an email of acknowledgment by noon on Tuesday April 7th indicating that the department is aware of the impact?

Thanks and regards,

Amber Saunders
Facilitator, Academic Programs and Accreditation
Gina Cody School of Engineering and Computer Science | Concordia University
514-848-2424 Ext: 4936

Undergraduate Program Regular Curriculum Change - GCS-MIAE-5967 - VERSION : 1

Summary and Rationale for Changes

Industrial Engineering Electives: Following the introduction of a new required course MIAE 383 Applied Machine Learning in Mechanical, Industrial and Aerospace Engineering, effective in 2026-27, significant content overlap with BSTA 478 (Data Mining Techniques) (replaced by BANA 478 Data Mining for Business Analytics) has been identified. Therefore, we are removing this course from the list of Other Industrial Engineering Elective courses to avoid redundancy.

Note: BSTA 478 was replaced by BANA 478 (effective 2026-27) (dossier JMSB-SCBTM-5784).

Resource Implications

None.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Feb 2026

The dossier was approved by GCS Council with no modifications requested.
GCS Council document number: ECFC 2026.02.03

Summary of Committee Discussion: FCC/FAPC/GCS Approval

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Feb 2026

Approved by:

Otmane Ait Mohamed, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 22 Jan 2026

Summary of Committee Discussion: Department approval

For Submission to:

Dr. Otmane Ait Mohamed, Associate Dean Academic Programs,
ECS USC,

Approved by:

Dr. Muthukumaran Packirisamy, Chair of MIAE,
MIAE department council, 24 Oct 2025

It was presented and approved at the MIAE Council meeting on October 24, 2025.

Summary of Changes (Undergraduate Program Regular Curriculum Change)

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Other Industrial Engineering Elective Courses			

DEFINED GROUP CHANGE FORM

Dossier Type: Undergraduate Program Regular Curriculum Change
Dossier Title: Industrial Engineering Elective Courses

Calendar Section Name: Other Industrial Engineering Elective Courses
Calendar Section Type: Defined group
Description of Change: Other Industrial Engineering Elective Courses

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Mechanical, Industrial and Aerospace Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 May 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.40 Department of Mechanical, Industrial and Aerospace Engineering > Section 71.40.2 Course Requirements (BEng in Industrial Engineering) > Degree Requirements > BEng in Industrial Engineering > Industrial Engineering Electives

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
Other Industrial Engineering Elective Courses	**credits**	Other Industrial Engineering Elective Courses
Students may take no more than one course from the following list: ~~BANA 478 Data Mining for Business Analytics (3)~~ BTM 480 Project Management (3) ENGR 411 Special Technical Report (1) ENGR 412 Honours Research Project (3) MANA 300 Entrepreneurship: Launching Your Business (3)		Students may take no more than one course from the following list: BTM 480 Project Management (3) ENGR 411 Special Technical Report (1) ENGR 412 Honours Research Project (3) MANA 300 Entrepreneurship: Launching Your Business (3)

Rationale:

Following the introduction of a new required course MIAE 383 Applied Machine Learning in Mechanical, Industrial and Aerospace Engineering, effective in 2026-27, significant content overlap with BSTA 478 (Data Mining Techniques) (replaced by BANA 478 Data Mining for Business Analytics) has been identified.

Therefore, we are removing this course from the list of Other Industrial Engineering Elective courses to avoid redundancy.

Note: BSTA 478 was replaced by BANA 478 (effective 2026-27) (dossier JMSB-SCBTM-5784).

Resource Implications:
None.

Impact Report

Defined Groups

Industrial Engineering Electives

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.40 Department of Mechanical, Industrial and Aerospace Engineering -> Section 71.40.2 Course Requirements (BEng in Industrial Engineering) -> Degree Requirements -> BEng in Industrial Engineering

Source of Impact

- Other Industrial Engineering Elective Courses

Graduate Program Regular Curriculum Change - AS-ECON-5838 - VERSION : 12

Summary and Rationale for Changes

The Department of Economics is requesting the following updates to graduate courses and the PhD program.

Course descriptions update, new courses, and renumbering

The department is requesting several changes to MA and PhD courses (ECON 600-level):

1. Course descriptions update
Many current course descriptions are outdated and no longer reflect the actual content being taught. The proposed revisions were developed in consultation with the faculty members currently teaching these courses.

2. Course additions (ECON 695 to regular numbered courses)
The following criteria guides the proposal to convert existing ECON 695 topic courses into formally numbered courses:

- Reflect actual and sustainable course offerings, making the program's academic content more explicit.
- These courses have been offered several times in the past with consistent and sustainable enrolments (see supporting document *Enrolments in 695 topics* for information about enrolments in these topics between Fall 2019 and Winter 2026).
- There is a sufficient number of faculty members with relevant expertise to potentially offer the course going forward.

3. Course deletions
Courses are proposed for deletion if:

- They have not been offered in a significant number of years (e.g., 25 years);
- No current faculty members have expertise in the relevant field.
- The course renumbering and change to description made it necessary to replace the original course with a new one.

Note that removed courses can still be offered in the future under the ECON 695 designation if faculty capacity changes.

4. Course renumbering
Some course numbers are currently inconsistent with their academic field (e.g., Industrial Organization grouped with Labour Economics). The proposed renumbering aims to bring greater coherence to the graduate calendar, using the following structure:

- 610–619: Core theory
- 620–626: Macroeconomics
- 627–639: Microeconomics
- 640–649: Financial economics
- 650–659: Public policy
- 660–669: International economics
- 670–679: Labour economics
- 680–6901: Econometrics
- 691–699: General/unspecified field

Please refer to supporting document *Summary of ECON course changes* for more information.

5. Removal of 500-level prerequisites for 600-level courses

- These prerequisites were originally intended for students in the Graduate Diploma program, who constitute a small portion of the student body and are only required to complete two 600-level courses.
- In practice, few students complete the diploma; it primarily serves as a transitional pathway to the MA program. Diploma students are typically advised to take ECON 501, 503, and 521 in their first term to meet MA admission requirements, making the 500-level prerequisites largely irrelevant.
- Some courses, such as ECON 525, are difficult to offer consistently due to persistently low enrolment.
- The presence of these prerequisites has caused confusion among MA students, who mistakenly believe they are required to complete these 500-level courses and sometimes register for them unnecessarily.
- As an alternative to prerequisites, we will implement enrolment reserve capacities for MA and PhD students to prevent registration by students from other departments or from the Graduate Diploma program. Diploma students will instead follow individualized study plans developed in consultation with the GPA or GPD. The prerequisites can thus be enforced by the department (i.e., ECON 501 before ECON 612).

Removing these prerequisites will reduce confusion, streamline course registration, and better reflect the structure and goals of the graduate programs.

PhD program changes: comprehensive examinations, research methods, and credit value for thesis

The change is requested to increase students' preparedness in research methods and to respond to the growing tendency of removing comprehensive examinations as a condition for completing advanced graduate studies in Economics across North America. The department is recommending the replacement of comprehensive exams with a research paper for two reasons:
1. Remove the point-in-time, high-stake exam-focused comprehensive examinations requirement (currently 4 credits).
2. Replace the comprehensive exams with two new sustained research-focuses requirements, ECON 696 Research Methodology in Economics (3 credits) and ECON 8020 – Research Paper (3 credits).

The shift from comprehensive exams to a research paper emphasizes the development and application of independent research skills rather than mastery of course material.

Please refer to the Proposal rationale supporting document for a comprehensive explanation for this change.

- Adjust the number and credit value of ECON 613 *Microeconomics II* (4 credits) to ECON 6130 (3 credits).
- Add ECON 696 *Research Methodology in Economics* (3 credits) to the degree requirements for PhD students.
- Adjust number and credit value of ECON 807 *Thesis* (46 credits) to ECON 8070 *(*45 credits).

These changes are intended to emphasize preparedness for independent research rather than a static measurement of knowledge.

Thank you for your consideration.

Resource Implications

There are no resource implications linked to the course changes, as these reflect the current faculty's research orientations and course allocation from the Faculty.

The change will not require adding a course to our usual allocation, as ECON 696 is already offered annually for Master's Economics students.

The associated workload for ECON 613 (4 credits) will revert to 3 credits under the renumbered ECON 6130 (3 credits), in line with other lecture courses offered by the Department of Economics.

The Department Council members discussed the implications of creating ECON 8020 Research Paper and the oversight required from faculty members during that exercise. Given the small number of PhD students in our recent cohorts, this oversight is expected to be manageable.

Graduate Program Regular Curriculum Change - AS-ECON-5838 - VERSION : 12

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 3 D6). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Programs and Development, School of Graduate Studies.,
Graduate Curriculum Committee, 12 Jan 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 21 Nov 2025

This proposal involves updating course descriptions and renumbering courses to align within specified ranges. The PhD in Economics is modified to reflect revised numbers and restructured accordingly. The Comprehensive Exam (ECON 802) is replaced by a Research Paper (ECON 8020), and , together with the new required course ECON 696 Research Methodology in Economics, will better prepare students for the thesis proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 19 Dec 2025

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 21 Nov 2025

This dossier was approved by the Faculty Curriculum Committee (FCC), and by delegation of its responsibility, by the Arts and Science Faculty Council. This dossier is thus moving forward for review at the next meeting of the Graduate Curriculum Committee (GCC).

Summary of Committee Discussion: Department approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty of Arts & Science Curriculum Council,

Approved by:

Christian Sigouin, Acting Chair,
Economics Department Council, 17 Sep 2025

The Economics Graduate Programs Committee (GPC) reviewed the contents of this dossier over the spring and summer. Email approval was obtained from all committee members.

The dossier was presented at the Economics Departmental Council on September 17, 2025.

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ECON 612 Microeconomics I Change				✎	✎					
ECON 613 Microeconomics II Delete	✖	✖	✖	✖	✖		✖	✖	✖	
ECON 6130 Microeconomics II New	★	★	★	★	★		★	★	★	
ECON 614 Game Theory Delete	✖	✖	✖	✖	✖		✖	✖	✖	
ECON 615 Macroeconomics I Change				✎	✎					
ECON 616 Macroeconomics II Change				✎	✎			✎		
ECON 618 Monetary Economics Delete	✖	✖	✖	✖	✖		✖	✖	✖	
ECON 619 Political Economy Delete	✖	✖	✖	✖	✖		✖	✖	✖	
ECON 620 Monetary Economics New	★	★	★	★	★	★	★	★	★	
ECON 621 Computational Economics New	★	★	★	★	★	★	★	★	★	
ECON 622 Economic Development Delete	✖	✖	✖	✖	✖		✖	✖	✖	
ECON 623 Growth and Development				✎	✎					

Change										
ECON 624 Topics in Economic Development Change										
ECON 627 Game Theory New										
ECON 630 Political Economics New										
ECON 631 Auctions and Markets New										
ECON 632 Market Design New										
ECON 634 Industrial Organization New										
ECON 637 Experimental Economics New										
ECON 642 Financial Economics I Change										
ECON 643 Financial Economics II Change										
ECON 656 Public Finance: Expenditure Delete										
ECON 657 Public Finance Change										
ECON 658 Environmental Economics Change										
ECON 661 International Trade Delete										
ECON 662 International Finance Change										
ECON 673 Industrial Organization Delete										
ECON 674 Economics of Regulation Delete										

ECON 677 Labour Economics Change			✎	✎	✎					
ECON 678 Labour Market Dynamics in Macroeconomics Change			✎	✎	✎					
ECON 680 Econometric Theory I Change				✎	✎			✎		
ECON 681 Econometric Theory II Change				✎	✎					
ECON 682 Time-Series Econometrics Change			✎	✎	✎					
ECON 683 Applied Econometrics: Microeconometrics Change			✎	✎	✎					
ECON 690 Mathematical Economics Delete	⊗	⊗	⊗				⊗	⊗	⊗	
ECON 6901 Applied Machine Learning New	★	★	★	★	★	★	★	★	★	
ECON 694 Reading Courses in Economics Delete	⊗	⊗	⊗	⊗	⊗		⊗	⊗	⊗	
ECON 695 Course in a Special Topic Change			✎	✎	✎					
ECON 696 Research Methodology in Economics Change				✎	✎			✎		
ECON 8020 Research Paper New	★	★	★	★	★		★	★	★	
ECON 8070 Thesis New	★	★	★	★	★		★	★	★	

Program Changes:

	Suspend Admissions	Program Degree Type Change	Program Title Change	Program Require-ments Change	Change to Program Type	Change to Total Credit Value of	Change to Primary Campus

						Program	
Economics PhD Change							

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: Economics PhD
Calendar Section Type: Program
Description of Change: Economics PhD Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics
Program Name: Economics PhD
Program Type: Thesis
Degree: PhD

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Arts and Science Programs > Economics Programs > Doctor/Doctorate > Economics PhD > Degree Requirements

Type of Change: Program Change

Present Text calendar		Proposed Text	
90 credits	Economics PhD	**90 credits**	Economics PhD
	~~19~~ credits of Required Courses: ECON 612 Microeconomics I (3) ECON ~~613~~ Microeconomics II ~~(4)~~ ECON 615 Macroeconomics I (3) ECON 616 Macroeconomics II (3) ECON 680 Econometric Theory I (3) ECON 681 Econometric Theory II (3) Students who have ~~taken ECON 612 , ECON 615 , and ECON 680~~ as part of their MA studies in the Department of Economics must substitute them with ~~three electives~~ with ~~department approval.~~ 12 credits of Program Elective Courses selected from the Department offerings. ~~13~~ credits: ECON ~~802 Comprehensive Examination (4)~~ ECON 804 Thesis Proposal (3) ECON 806 Research Seminar (6) ~~46~~ credits: ECON ~~807~~ Thesis ~~(46)~~		21 credits of Required Courses: ECON 612 Microeconomics I (3) ECON 6130 Microeconomics II (3) ECON 615 Macroeconomics I (3) ECON 616 Macroeconomics II (3) ECON 680 Econometric Theory I (3) ECON 681 Econometric Theory II (3) ECON 696 Research Methodology in Economics (3) Students who have completed required courses as part of their MA studies in the Department of Economics must substitute them with elective courses in consultation with the Economics Graduate Program Director. 12 credits of Program Elective Courses selected from the Department offerings. 12 credits: ECON 8020 Research Paper (3) ECON 804 Thesis Proposal (3) ECON 806 Research Seminar (6) 45 credits: ECON 8070 Thesis (45)

Rationale:

D1

These changes are intended to emphasize preparedness for independent research rather than the measurement of knowledge through a point-in-time, high-stakes exam.

Replacing ECON 802 *Comprehensive Examination* with ECON 8020 *Research Paper* as presented in this dossier requires updates to the following:

- ECON 613: from 4 to 3 credits, the additional credit being tied to preparing for the comprehensive examination
- ECON 696 and 8020: 6 credits to prepare for the thesis proposal.
- ECON 8070: 45 credits to adjust the total to 90.

Specifically, students would take ECON 696 *Research Methodology in Economics* (3 credits) during the first summer of the program and submit a completed research paper in their second year under ECON 8020 (3 credits).

The number of credits allocated to the PhD thesis would be adjusted from 46 to 45, reflecting the removal of the 4-credit comprehensive exams and the addition of ECON 696 and ECON 8020.

This approach would engage students in research earlier, allow the department to evaluate their research potential rather than their exam performance, and reduce time to completion. It would also align with the summer seminar series for graduate students, which could serve as the culmination of this research exercise.

We clarified the language to ensure students understand that required courses completed within the MA cannot be repeated within the PhD; instead, they must be replaced in order to meet the required number of course credits.

Resource Implications:

The courses required in the PhD are already offered.

The matter of sustainability is also considered in the change: The Faculty of Arts & Science has asked us to address the persistent problem of low enrolments in our second-term PhD courses (ECON 613, 616, and 681).

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 612
Calendar Section Type: Course
Description of Change: ECON 612 Microeconomics I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 612 Microeconomics I (3 credits)	ECON 612 Microeconomics I (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~is devoted~~ to ~~modern~~ consumer and ~~producer theories. Consumer theory is presented first, and at some length, due~~ to ~~its inherent importance, as well as the overlap between the methods and results in this area and in producer~~ theory. ~~Producer theory is dealt with next. In this section of the course,~~ the ~~similarities and differences between these two important building blocks~~ of ~~modern microeconomics are emphasized.~~	This course provides a rigorous introduction to microeconomic theory, covering topics such as consumer behaviour, revealed preference theory, production theory, and an introduction to game theory. The course emphasizes the development of formal mathematical models to analyze economic behavior.
Component(s):	*Component(s):*
Lecture ; Laboratory	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA and PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 613

Calendar Section Type: Course

Description of Change: ECON 613 Microeconomics II Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 613 Microeconomics II~~ (~~4~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 612 .~~	
Description :	*Description :*
~~This course covers a number of topics in microeconomic theory. Main topics include general equilibrium theory and welfare economics, topics in the theory of information, contracts and principal-agent problems, and selected topics in game theory.~~	
Component(s):	*Component(s):*
~~Lecture ; Laboratory~~	
Notes :	*Notes :*

Rationale:

The course was originally structured as a 4-credit offering with additional contact hours devoted to game theory in preparation for the comprehensive exam. With the removal of the comprehensive exam, this extra component is no longer required. See new course entry for ECON 6130 (3 credits).

Resource Implications:

Faculty teaching this course will go back to receiving 3 credits, which will be consistent with the expected workload.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 6130

Calendar Section Type: Course

Description of Change: ECON 6130 Microeconomics II New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 6130 Microeconomics II (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: ECON 612
Description :	*Description :*
	This course covers advanced topics in microeconomic theory, including general equilibrium theory, choice under uncertainty, the economics of information, and selected topics in game theory and mechanism design. Emphasis is placed on the development and application of formal models to analyze strategic behaviour and information asymmetries in economic environments.
Component(s):	*Component(s):*
	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

The course was originally structured as a 4-credit offering under ECON 613 with additional contact hours devoted to game theory in preparation for the comprehensive exam. With the removal of the comprehensive exam, this extra component is no longer required.

Game theory remains an important area of study, but students who plan to pursue research in microeconomic theory can take it in greater depth through the elective ECON 627 Game Theory later in the program.

This adjustment preserves academic rigour while matching the course's scope and workload to its revised objectives. At 3 credits, the course also falls in line with the structure of other courses in the program and with practices at comparable universities.

Resource Implications:

Faculty teaching this course will go back to receiving 3 credits, which will be consistent with the expected workload.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 614
Calendar Section Type: Course
Description of Change: ECON 614 Game Theory Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 614 Game Theory~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following course must be completed previously: ECON 612 .~~	
Description :	*Description :*
~~This course offers an in-depth coverage of some important topics in mostly non-cooperative but also cooperative game theory. Although formal reasoning, precise definitions and proofs are part of the course, emphasis is placed on the importance and use of the various concepts in economics. Main topics include Nash equilibrium and subgame perfection, correlated equilibria, rationalizability, zero-sum games, repeated games, (perfect) Bayesian Nash equilibrium, core Shapley value, bargaining problems, and stable sets.~~	
Component(s):	*Component(s):*
~~Lecture ; Laboratory~~	
Notes :	*Notes :*

Rationale:

This course has been replaced with ECON 627 Game Theory, found further in this dossier, with an updated course description that better reflects the course content offered by the department.

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 615

Calendar Section Type: Course

Description of Change: ECON 615 Macroeconomics I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 615 Macroeconomics I (3 credits)	ECON 615 Macroeconomics I (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 503 and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
~~The objective of this~~ course ~~is to introduce students~~ to ~~advanced theories and mathematical tools for rigorous analysis of various~~ macroeconomic ~~issues. Topics covered include consumption, investment, inflation and economic~~ growth ~~theories including Solow, Ramsey-Cass-Koopmans,~~ and ~~endogenous growth~~ models.	This course offers a rigorous introduction to dynamic macroeconomic theory, covering growth models, overlapping generations models, business cycle models, monetary economies, and new Keynesian models. Emphasis is placed on microfoundations, equilibrium concepts, and dynamic programming.
Component(s):	*Component(s):*
Lecture ; Laboratory	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Specifically, ECON 525 Mathematics for Advanced Studies in Economics was last offered in Winter 2024 and there are no plans for offering this course again. The department is offering Moodle tools to students seeking to enhance their math preparation.

Access to this course will be reserved for students in the MA and PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 616
Calendar Section Type: Course
Description of Change: ECON 616 Macroeconomics II Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 616 Macroeconomics II (3 credits)	ECON 616 Macroeconomics II (3 credits)
Prerequisites:	*Prerequisites:*
The following course must be completed previously: ECON 615 .	The following course must be completed previously: ECON 615 . Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~studies various issues in~~ macroeconomic theory within a dynamic general equilibrium ~~framework.~~ Topics ~~covered vary from year to year. However, the first part of the course is usually an initiation into useful techniques such as dynamic programming~~ and ~~the numerical methods.~~	This course examines macroeconomic theory within a dynamic general equilibrium heterogeneous-agent framework, with emphasis on efficient allocation under aggregate and idiosyncratic uncertainty. Topics include Pareto optimality, equilibria in complete and incomplete market economies, growth models, taxation, economic inequality, and policy analysis in overlapping generations models with idiosyncratic risk.
Component(s):	*Component(s):*
Laboratory	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

The 'Lecture' component was missing from this course.

We are requesting an update to the course description to better reflect the topics covered in the course.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 618
Calendar Section Type: Course
Description of Change: ECON 618 Monetary Economics Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 618 Monetary Economics~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following course must be completed previously: ECON 615 .~~	
Description :	*Description :*
~~This course includes the theory of money, monetary policy, payment systems, and banking. Among the available models, there will be a particular focus on the New Keynesian model as a framework to analyze monetary policy. Alternative models of money, such as search-theoretic models, are also studied.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course has been replaced with ECON 620 Monetary Economics, found further in this dossier, with an updated course description that better reflects the course content offered by the department.

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 619
Calendar Section Type: Course
Description of Change: ECON 619 Political Economy Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 619 Political Economy~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 614 and ECON 615 .~~	
Description :	*Description :*
~~This course studies how conflicts of interest are resolved through political institutions in democratic countries. In the first half of the course, tools and models that are useful in the analysis of voting and elections, bargaining in legislatures, and special interest politics are studied. In the second half, these tools are applied to examine: (1) how macroeconomic polices are made through the political process; (2) why inefficient policies may be chosen in the end; and (3) how constitutions (indirectly) shape public policy and consequently the economic outcomes of nations.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course has been replaced with ECON 630 *Political Economics*, found further in this dossier, with an updated course description that better reflects the course content offered by the department.

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 620

Calendar Section Type: Course

Description of Change: ECON 620 Monetary Economics New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 620 Monetary Economics (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course uses the New Keynesian framework to explore why money is valued, the objectives of monetary policy, and the evaluation of monetary policy effects, with tools such as constrained optimization and dynamic programming.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for ECON 618 may not take this course for credit.

Rationale:

This course is the equivalent of ECON 618 Monetary Economics.

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

An effort was made to regroup courses to bring greater coherence to the graduate calendar (putting this course in the 620 - 629 Macroeconomics category instead of in Core theory), as explained in the introduction to this dossier.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 621

Calendar Section Type: Course

Description of Change: ECON 621 Computational Economics New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 621 Computational Economics (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course develops the skills and knowledge needed to formulate and solve dynamic economic models using advanced numerical techniques. These tools have become central to many areas of economics, enabling researchers to solve models that were previously intractable. The methods taught in this course are applicable to research in applied microeconomics, econometrics, and macroeconomics.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as an ECON 695 *Seminar in a Special Topic*. The Department made the decision to move this course to its regular offerings based on the criteria described in the introduction to this dossier (faculty availability and relevance of the topic for advanced studies in Economics).

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Enrolments:

Fall 2019: 5/25
Fall 2020: 9/25
Fall 2021: 29/25

Fall 2022: 8/25
Winter 2026: 11/12

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 622
Calendar Section Type: Course
Description of Change: ECON 622 Economic Development Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 622 Economic Development~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 503 ; and ECON 525 ; or equivalent.~~	
Description :	*Description :*
~~Modern theories of economic development are presented. Topics include microeconomic reform and transition in developing economies, income inequality and enterprise and, foreign investment and technology flows as a means to development. In addition, analytical techniques used in the study of structure and functioning of developing economies are presented.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course is recommended for deletion as:

- it has not been offered in a significant number of years (e.g., 25 years);
- No current faculty members have expertise in the relevant field.

The department can still offer this topic in the future under the ECON 695 designation if faculty capacity changes.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 623

Calendar Section Type: Course

Description of Change: ECON 623 Growth and Development Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 623 Growth and Development (3 credits)	ECON 623 Growth and Development (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 503 and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course examines ~~a series of models that are relevant to the study~~ of economic growth and ~~development. These two issues are studied from~~ a macroeconomic ~~perspective; that is, emphasis is placed on highly stylized models characterized by rational decision making within~~ a ~~dynamic environment.~~	This course examines how our understanding of economic growth has evolved over time and how this evolution has shaped economic and development policies. The course takes a macroeconomic perspective, with a focus on growth and development policies, their inherent challenges, and the factors that mitigate their success.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 624
Calendar Section Type: Course
Description of Change: ECON 624 Topics in Economic Development
Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 624 Topics in Economic Development (3 credits)	ECON 624 Topics in Economic Development (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 503 and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
~~Why are some countries poor~~ and ~~others rich? What can account for cross-country~~ differences ~~in fertility~~ and ~~mortality rates? In gender gaps, civil war,~~ and ~~school attainment? Why did the industrial revolution start in Europe? Why did Europe colonize the rest of the world, rather than the other way around? Why are some former colonies (e.g., U.S., Canada) so much richer than others (e.g., India~~ and ~~Zimbabwe)? This course presents research which addresses these issues. While emphasis in on theoretical research where overlapping-generations models are used to generate multiple steady-state equilibria, empirical work is also examined.~~	This course examines the root causes and mechanisms behind income differences across nations. It focuses on models of human capital, fertility, and health, as well as productivity and structural transformation, institutions, and financial development.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 627
Calendar Section Type: Course
Description of Change: ECON 627 Game Theory New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 627 Game Theory (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course offers in-depth coverage of some important topics in mostly non-cooperative, but also cooperative, game theory. While formal reasoning, precise definitions, and proofs are part of the course, the emphasis is on interpreting and applying game-theoretic concepts in economics. Main topics include Nash equilibrium and subgame perfection, correlated equilibrium, rationalizability, repeated games, Bayesian games, the core, the Shapley value, and stable sets.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for ECON 614 or for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as ECON 614 Game Theory.

This course has been updated to better reflect the course content offered by the department.

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 630
Calendar Section Type: Course
Description of Change: ECON 630 Political Economics New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 630 Political Economics (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course examines the connection between individual preferences and the economic and political outcomes in democratic societies. It considers both the interaction of individuals and entities within given political processes and institutions, and how these processes and institutions are shaped by individual and societal interests. The course employs game-theoretic and information-theoretic tools for analysis. Topics covered include voting, election campaigns, legislative processes, political accountability, and political reforms, among others.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for ECON 619 or for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as ECON 619 Political Economics.

This course has been updated to better reflect the course content offered by the department.

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 631

Calendar Section Type: Course

Description of Change: ECON 631 Auctions and Markets New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 631 Auctions and Markets (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course explores the design of institutions and markets, with a focus on mechanism and market design. Primary emphasis is placed on mechanisms involving monetary transactions, with auctions as a key example. This interdisciplinary topic spans economics, operations research, and computer science. The course also covers mechanisms without monetary transfers and introduces the emerging field of information design.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as an ECON 695 Seminar in a Special Topic. The Department made the decision to move this course to its regular offerings based on the criteria described in the introduction to this dossier (faculty availability and relevance of the topic for advanced studies in Economics).

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Enrolments:

Fall 2019: 18/25
Fall 2025: 8/15

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 632

Calendar Section Type: Course

Description of Change: ECON 632 Market Design New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 632 Market Design (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course examines the design and analysis of markets that require a selection process and do not rely on prices. To understand how the organization of such markets affects their performance, several centrally administered mechanisms and their properties are discussed, including those used in real-world marketplaces. The course also explores the interplay between theory and practice, with applications to labor market clearinghouses, school choice programs, and the allocation of organs for transplantation.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as an ECON 695 Seminar in a Special Topic. The Department made the decision to move this course to its regular offerings based on the criteria described in the introduction to this dossier (faculty availability and relevance of the topic for advanced studies in Economics).

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Enrolments:

Fall 2020: 14/25
Fall 2021: 15/25
Fall 2022: 11/25

Winter 2025: 14/12

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 634

Calendar Section Type: Course

Description of Change: ECON 634 Industrial Organization New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 634 Industrial Organization (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course introduces the theory of industrial organization, focusing on firm behaviour in various market structures. It uses price theory and game-theoretic tools for this analysis. Topics include monopoly pricing, price discrimination, product differentiation, oligopoly, entry and exit, advertising, information disclosure, data privacy, and digital platforms.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for ECON 673 may not take this course for credit.

Rationale:

This course is replacing ECON 673 Industrial Organization. An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 637

Calendar Section Type: Course

Description of Change: ECON 637 Experimental Economics New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 637 Experimental Economics (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course introduces students to the basic methodology of experimental economics and discusses its applications in behavioural game theory, financial economics, public economics, labour economics, political economics, environmental economics, and decision theory.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as an ECON 695 Seminar in a Special Topic. The Department made the decision to move this course to its regular offerings based on the criteria described in the introduction to this dossier (faculty availability and relevance of the topic for advanced studies in Economics).

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Enrolments:

Winter 2023: 24/25
Winter 2024: 14/18
Winter 2026: 11/12

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 642
Calendar Section Type: Course
Description of Change: ECON 642 Financial Economics I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 642 Financial Economics I (3 credits)	ECON 642 Financial Economics I (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 503 ; and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~is the first of a two course sequence~~ in financial economics, and ~~is intended to provide an introduction to contemporary theoretical~~ and ~~empirical modeling~~ in financial ~~markets. The~~ course provides a foundation for ~~more advanced work in~~ financial ~~economics while allowing students without an exceptionally strong mathematical background to become familiar with the discipline. Theoretical topics include measures of risk aversion, stochastic dominance, individual portfolio choice under uncertainty, the capital asset pricing model (CAPM),~~ and ~~the arbitrage~~ pricing ~~theory (APT). Empirical topics include tests of CAPM and the APT, the efficient markets hypothesis, performance evaluation, and event test methodology.~~	This course surveys major themes in financial economics, emphasizing competitive financial equilibrium across models like Arrow-Debreu and the Consumption Capital Asset Pricing Model. It covers fundamental financial theory concepts and develops arbitrage pricing models used in the financial industry for pricing futures, swaps, options, and structured products. Integrating utility-based theoretical frameworks with these practical models, the course provides a comprehensive foundation for understanding financial markets and pricing mechanisms.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 643
Calendar Section Type: Course
Description of Change: ECON 643 Financial Economics II Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 643 Financial Economics II (3 credits)	ECON 643 Financial Economics II (3 credits)
Prerequisites:	*Prerequisites:*
The following courses must be completed previously: ECON 642 and ECON 680 .	The following courses must be completed previously: ECON 642 and ECON 680 . Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~is the second of a two course sequence in financial economics, and is intended to provide an introduction to several advanced topics in theoretical~~ and empirical ~~financial economics. Theoretical topics include the valuation of state~~ contingent ~~securities, dynamic asset~~ pricing, and ~~continuous-time methods. Empirical topics include~~ the ~~time-series properties~~ of ~~returns, traditional structural estimation of~~ asset pricing ~~models of maximum-likelihood (ML)~~ and the generalized ~~method-of-moments (GMM), calibration~~ and ~~simulation, variance bounds tests,~~ and ~~an introduction to empirical methods for continuous-time~~ models.	This course explores asset pricing theory through continuous-time models and introduces recent empirical methods in finance. The first part covers diffusion models, stochastic calculus, contingent securities pricing, and the term structure of interest rates. The second part covers advanced financial econometrics, including asset pricing model estimation, and continuous-time econometrics. Topics also include the generalized method of moments, maximum likelihood, and nonparametric estimation of diffusion processes, and volatility models.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites remain, as the topics covered in this course require background in financial economics and econometrics.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 656
Calendar Section Type: Course
Description of Change: ECON 656 Public Finance: Expenditure
Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 656 Public Finance: Expenditure~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 and ECON 525 ; or equivalent.~~	
Description :	*Description :*
~~This course deals with welfare economics and the role of the government in supplying goods. The principal topics are the optimal supply of public goods, voting mechanisms and models of preference revelation, consumer's surplus, externalities in production and consumption, optimal pricing models, the theory of clubs, inequality, cost-benefit analysis, federalism and federal-provincial relations in Canada.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course is being recommended for deletion as:

- It has not been offered in a significant number of years (e.g., 25 years);
- No current faculty members have expertise in the relevant field.

Removed courses can still be offered in the future under the ECON 695 designation if faculty capacity changes.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 657

Calendar Section Type: Course

Description of Change: ECON 657 Public Finance Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 657 Public ~~Finance: Taxation~~ (3 credits)	ECON 657 Public Finance (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~analyzes both the descriptive~~ and ~~normative effects of alternative taxation~~ policies ~~on~~ economic ~~behaviour. In the descriptive part it deals with~~ work-leisure ~~choice,~~ saving ~~decisions~~ and ~~the incidence of the corporation income tax. The normative part deals with the optimality issues of income~~ and ~~commodity taxation.~~ Emphasis is ~~given to both~~ analytical and policy ~~considerations.~~	This course examines how taxation and public expenditure policies shape economic behaviour, including work-leisure choices and saving decisions. It evaluates optimal tax and spending designs for equity, efficiency, and fiscal sustainability. Emphasis is on analytical tools and policy applications.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

'Taxation' unnecessarily limited the breadth of the course content.

The updated course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 658

Calendar Section Type: Course

Description of Change: ECON 658 Environmental Economics Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 658 Environmental Economics (3 credits)	ECON 658 Environmental Economics (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course deals with the inter-relationship between economics and the physical environment. The objective is to depict the problem of environmental quality as an economic problem. The course focuses on the use of concepts and instruments derived from public finance for the resolution of environmental issues. Numerous case studies are discussed.	This course deals with the inter-relationship between economics and the physical environment. The objective is to depict the problem of environmental quality as an economic problem. The course focuses on the use of concepts and instruments derived from public finance for the resolution of environmental issues. Numerous case studies are discussed.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention. Most MA and PhD students are admitted without having specifically completed ECON 525: the undergraduate equivalent of this course (ECON 425) is not a requirement for any of the BA concentrations. This prerequisite was therefore acting as an artificial barrier for students.

Access to this course will be reserved for students in the MA and PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 661
Calendar Section Type: Course
Description of Change: ECON 661 International Trade Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 661 International Trade~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 525 ; or equivalent.~~	
Description :	*Description :*
~~This course provides a systematic treatment of neo-classical international trade theory, including the theory of comparative advantage, the theory and practice of commercial policy, trade and welfare, and customs union theory. The course emphasizes the interaction of trade theory with policy questions.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course is being recommended for deletion as:

- It has not been offered in a significant number of years (e.g., 25 years);
- No current faculty members have expertise in the relevant field.

Removed courses can still be offered in the future under the ECON 695 designation if faculty capacity changes.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 662
Calendar Section Type: Course
Description of Change: ECON 662 International Finance Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 662 International Finance (3 credits)	ECON 662 International Finance (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 503 and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
Selected topics in international finance or open economy macroeconomics are analyzed within modern dynamic general equilibrium models. These include deviations from the law of one price and from purchasing power parity, pricing to market, exchange rate determination, the international transmission of business cycles, the international financial system and crises, sovereign debt and default, global trade imbalances, currency unions (like the European Monetary Union), customs unions (like the European Union), and optimal monetary and fiscal policy in an open economy setting.	Selected topics in international finance or open economy macroeconomics are analyzed within modern dynamic general equilibrium models. These include deviations from the law of one price and from purchasing power parity, pricing to market, exchange rate determination, the international transmission of business cycles, the international financial system and crises, sovereign debt and default, global trade imbalances, currency unions (like the European Monetary Union), customs unions (like the European Union), and optimal monetary and fiscal policy in an open economy setting.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 673

Calendar Section Type: Course

Description of Change: ECON 673 Industrial Organization Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 673 Industrial Organization~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 525 ; or equivalent.~~	
Description :	*Description :*
~~This course surveys economic models of industrial behaviour. Topics covered include theories of oligopoly, effects of potential entry, product differentiation, advertising, technological change, vertical integration, monopoly and merger issues.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course has been replaced with ECON 634 Industrial Organization, with a description that better reflects the course content offered by the department.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 674
Calendar Section Type: Course
Description of Change: ECON 674 Economics of Regulation Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 674 Economics of Regulation~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 525 ; or equivalent.~~	
Description :	*Description :*
~~This course examines economic theories of regulation as applied to monopolized and competitive industries, together with their policy implications. Topics covered include natural monopoly, contestable markets, effects of "traditional" regulation (such as rate of return and Ramsey pricing), together with an examination of recent theories of optimal regulation under asymmetric information. Topics in the regulation of industries include minimum quality standards, licensing, and predatory business practices.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*

Rationale:

This course is being recommended for deletion as:

- It has not been offered in a significant number of years (e.g., 25 years);
- No current faculty members have expertise in the relevant field.

Removed courses can still be offered in the future under the ECON 695 designation if faculty capacity changes.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 677
Calendar Section Type: Course
Description of Change: ECON 677 Labour Economics Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 677 Labour ~~Economics I~~ (3 credits)	ECON 677 Labour Economics (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 501 ; ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~covers selected topics in the field of~~ labour ~~economics. The focus of the course is on microeconomic analyses and issues. The emphasis is on the application of some of the ideas from the theories of information, uncertainty, and incentives to the understanding of labour markets and institutions. Topics covered include wage and wage differentials, discrimination,~~ human capital, ~~life-cycle models of labour markets, effects of asymmetric information, self-enforcing implicit contracts, efficiency~~ wage ~~models, principal-agent problems, team production~~ and ~~tournaments.~~	This course studies labour supply, welfare dependency, human capital, migration, discrimination, and wage inequality. It covers structural and non-structural approaches, focusing on theory, econometric methods, and policy applications.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

The 'I' in the current course title suggests a sequence with another course after this one. Since there is none, we recommend removing the 'I' to avoid confusion.

We are also requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 678

Calendar Section Type: Course

Description of Change: ECON 678 Labour Market Dynamics in Macroeconomics Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 678 Labour ~~Economics II~~ (3 credits)	ECON 678 Labour Market Dynamics in Macroeconomics (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 612 and ECON 680 .~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
~~The main objective of this~~ course ~~is to examine a relatively small number of~~ topics in ~~modern~~ labour ~~economics and, ultimately, their~~ empirical ~~and econometric application. The~~ topics ~~covered~~ include ~~static and dynamic models~~ of labour ~~supply, dynamic models of~~ job ~~search~~ and ~~job matching, econometric analysis of~~ labour market ~~transition data, unemployment insurance,~~ and ~~unemployment theories.~~	This course covers selected topics in labour market dynamics, integrating theoretical frameworks and empirical studies with a macroeconomic focus. Key topics include advanced theories of employment, wages, labour income processes, job search, job creation, labour market transitions, and labour mobility. The course also explores labour market institutions and the effects of various policies, such as minimum wage regulations and (un)employment insurance. In addition, students gain hands-on experience with advanced quantitative data analysis.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

The previous title led students to believe that they had to take ECON 677 *Labour Economics I* before ECON 678 *Labour Economics II*. In practice, ECON 677 is a microeconomics / empirical course, while ECON 678 is more macroeconomics / empirical. Changing the title of ECON 678 emphasizes the macroeconomics orientation.

We are also requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 680
Calendar Section Type: Course
Description of Change: ECON 680 Econometric Theory I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 680 Econometric Theory I (3 credits)	ECON 680 Econometric Theory I (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ECON 521 and ECON 525 ;~~ or ~~equivalent.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
~~The general aim of this~~ course ~~is to discuss some of the fundamental methods of econometrics and their~~ theoretical ~~justification. The course begins with a mathematical and statistical review and moves~~ on ~~to a thorough discussion of~~ the ~~general theory of~~ least squares ~~(including instrumental variables) and maximum likelihood, their justification and associated tests~~ of ~~significance. Applications include linear, single-equation~~ and ~~simultaneous equations models, some non-linear models,~~ and ~~specification analysis. Students are expected to undertake various exercises, including computer-based applications.~~	This course introduces theoretical econometrics, focusing on linear regression models and estimation methods. Topics include the ordinary least squares estimator, maximum likelihood estimation, asymptotic theory, the Generalized Method of Moments, and issues arising from heteroskedasticity, autocorrelation, and endogeneity. The course also covers foundational concepts of causal inference.
Component(s):	*Component(s):*
Lecture	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

This course has a mandatory lab component that was missing from the description.

We are requesting an update to the course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None. The lab has been offered for several years.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 681
Calendar Section Type: Course
Description of Change: ECON 681 Econometric Theory II Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 681 Econometric Theory II (3 credits)	ECON 681 Econometric Theory II (3 credits)
Prerequisites:	*Prerequisites:*
The following course must be completed previously: ECON 680 .	The following course must be completed previously: ECON 680 . Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course covers advanced topics in ~~estimation and inference in~~ non-linear ~~econometric models~~ including asymptotic ~~theory,~~ generalized method of moments, quasi-maximum likelihood, ~~simulation based methods, non-parametric~~ and semiparametric ~~estimation, bootstrap methods~~ and ~~robust estimators.~~	This course covers advanced topics in non-linear econometrics, including asymptotic theory for extremum estimators, the generalized method of moments, quasi-maximum likelihood, and simulation-based methods such as indirect inference and the simulated method of moments, as well as nonparametric and semiparametric estimation techniques. Additional topics include causal inference, quantile regression, and the analysis of static and dynamic panel data models.
Component(s):	*Component(s):*
Lecture ; Laboratory	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 682

Calendar Section Type: Course

Description of Change: ECON 682 Time-Series Econometrics Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 682 ~~Applied Econometrics: Time-Series~~ (3 credits)	ECON 682 Time-Series Econometrics (3 credits)
Prerequisites:	*Prerequisites:*
~~The following course must be completed previously: ECON 680 .~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course provides ~~an~~ introduction to ~~statistical techniques for analyzing time-series data.~~ Topics include ~~Box-Jenkins methodology, spectral analysis,~~ forecasting, ~~tests for~~ unit roots, ~~multivariate time-series analysis: vector autoregressions, causality,~~ cointegration, and nonlinear ~~time-series models such as ARCH~~ models.	This course provides a theoretical and applied introduction to time series econometrics, with an emphasis on models used in macroeconomics and finance. Topics include the properties of univariate stationary processes, Autoregressive Moving Average (ARMA) models and their use in forecasting, causality, and vector autoregressive (VAR) models. The course also examines nonstationary processes, including unit roots, cointegration, and vector error correction models, as well as nonlinear time series models.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the course title and description to better reflect the topics covered in the course.

The prerequisite has been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA and PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 683

Calendar Section Type: Course

Description of Change: ECON 683 Applied Econometrics: Microeconometrics Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 683 ~~Applied Econometrics:~~ Microeconometrics (3 credits)	ECON 683 Microeconometrics (3 credits)
Prerequisites:	*Prerequisites:*
~~The following course must be completed previously: ECON 680~~ or ~~equivalent, and one successfully completed graduate level course~~ in ~~econometrics. If prerequisites are not satisfied,~~ permission of the ~~instructor is required.~~	Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course ~~provides an introduction~~ to ~~statistical techniques~~ and ~~practical aspects~~ of ~~microeconometric analysis. Topics include binary response models, censored~~ and ~~truncated regression models, analysis of categorical survey data,~~ instrumental ~~variables, treatment effects, panel data~~ models ~~with fixed~~ and ~~random effects, analysis~~ of ~~transition data, estimation by simulation,~~ and ~~estimation of dynamic programming models.~~	This course introduces students to advanced econometric methods, with a focus on modeling and estimation techniques used in microeconomic applications. It begins with a review of linear regression models and instrumental variables. It then covers models for discrete and limited dependent variables, maximum likelihood estimation, and program evaluation techniques such as matching, differences-in-differences, and regression discontinuity. The course emphasizes the practical application of econometric tools through coding and data analysis.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*

Rationale:

We are requesting an update to the title and course description to better reflect the topics covered in the course.

The prerequisites have been removed as students are admitted to the MA or PhD in Economics with the proper level to be eligible to take this course without the department's permission or intervention.

Access to this course will be reserved for students in the MA and PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 690

Calendar Section Type: Course

Description of Change: ECON 690 Mathematical Economics Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 690 Mathematical Economics~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:

This course has not been offered in at least the past 30 years, and there are no plans to offer it in the future. It cannot sustain a viable enrollment.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 6901

Calendar Section Type: Course

Description of Change: ECON 6901 Applied Machine Learning New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 6901 Applied Machine Learning for Economics (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :* This course introduces students to machine learning methods and their applications in economics. The focus is on supervised learning, with an emphasis on predictive methods. Topics include high-dimensional regression and classification, splines, tree-based methods, support vector machines, and deep learning. Selected aspects of causal machine learning are also covered.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under ECON 695 may not take this course for credit.

Rationale:

This course was previously offered as an ECON 695 topic course.

This course has been updated to better reflect the course content offered by the department.
An effort was made to regroup courses to bring greater coherence to the graduate calendar, as explained in the introduction to this dossier.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Enrolments:
Fall 2024: 14/16
Fall 2025: 15/15

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 694

Calendar Section Type: Course

Description of Change: ECON 694 Reading Courses in Economics

Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ECON 694 Reading Courses in Economics~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
~~Permission of the Graduate Studies Committee is required.~~	
Description :	*Description :*
~~A supervised reading course in a specialized area in which no course is offered by the Department.~~	
Component(s):	*Component(s):*
~~Reading~~	
Notes :	*Notes :*

Rationale:

The reading course is proposed for deletion because it lacks clear and consistent standards of evaluation. Unlike other graduate courses, it does not provide measurable benchmarks for workload or learning outcomes. Its removal will ensure greater consistency across courses and strengthen the overall coherence of program requirements.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 695
Calendar Section Type: Course
Description of Change: ECON 695 Course in a Special Topic Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 695 ~~Seminar~~ in a Special Topic (3 credits)	ECON 695 Course in a Special Topic (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
~~Recent Special Topics have included: Monetary Economics; Game Theory; Workshop~~ in ~~Advanced Economic Theory; Applied Industrial Organization; Empirical Trade; Political Economics; Natural Resources~~ and ~~Environmental Economics Workshop.~~	This course provides an opportunity to study a selected topic in economics. Topics vary by term and reflect current interests and faculty expertise.
Component(s): Lecture	*Component(s):* Lecture
Notes : **Allow this course to be taken more than one time for credit :** This course may be taken more than one time for credit, provided the subject matter is different each time.	*Notes :* **Allow this course to be taken more than one time for credit :** This course may be taken more than one time for credit, provided the subject matter is different each time.

Rationale:

We are requesting an update to the course description to better explain the topics that may be covered in the course. The listings were needlessly reductive.

The term "seminar" did not reflect the nature of the courses offered under this number.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 696
Calendar Section Type: Course
Description of Change: ECON 696 Research Methodology in Economics Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ECON 696 Research Methodology in Economics (3 credits)	ECON 696 Research Methodology in Economics (3 credits)
Prerequisites:	*Prerequisites:* Enrolment in the MA or PhD in Economics is required, or permission of the Department.
Description :	*Description :*
This course introduces students to the ~~approach followed by~~ economists to conduct scientific research and ~~produce~~ knowledge. ~~Students learn~~ how to formulate a ~~pertinent~~ research ~~question, how to perform a critical evaluation of~~ the ~~relevant~~ literature, ~~how to determine the appropriate methodology to answer this question,~~ and ~~how to~~ communicate findings effectively. The course also ~~examines common pitfalls in~~ data ~~gathering~~ and ~~data analysis.~~	This course introduces students to the methods economists use to conduct scientific research and generate new knowledge. It covers how to formulate a research question and hypothesis, review the literature, build and explain a suitable model, describe data, and communicate findings effectively. The course also discusses data sources and types, as well as key research design concerns such as endogeneity.
Component(s):	*Component(s):*
Lecture	Lecture ; Thesis Research
Notes :	*Notes :*

Rationale:

We are requesting an update to the course description to better reflect the topics covered in the course.

The addition of the "thesis research" component is requested as this course will become mandatory for PhD Economics students, as per the Program Change described in this dossier.

Access to this course will be reserved for students in the MA or PhD in Economics: Graduate Diploma students will be asked to contact the department to enroll in this course.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 8020

Calendar Section Type: Course

Description of Change: ECON 8020 Research Paper New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 8020 Research Paper (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: ECON 696 .
Description :	*Description :*
	Doctoral students are required to submit an original research paper by the end of the second academic year, demonstrating the knowledge and skills gained during the first two years and the capacity to conduct independent research in economics. The paper should pose a clear and well-motivated research question; situate it within the relevant literature; develop testable hypotheses or a coherent analytical, theoretical, or computational framework as appropriate; apply a suitable methodological approach; analyze and interpret results or model implications; and reflect on the work's potential contribution. Satisfactory completion of this paper, as determined by a faculty committee appointed by the Graduate Program Director, is required to advance in the program.
Component(s):	*Component(s):*
	Thesis Research
Notes :	*Notes :*

Rationale:

The department is recommending the replacement of comprehensive exams with a research paper for two reasons:

1. Remove the point-in-time, high-stake exam-focused comprehensive examinations requirement (currently 4 credits).

2. Replace the comprehensive exams with two new sustained research-focuses requirements, ECON 696 Research Methodology in Economics (3 credits) and ECON 8020 – Research Paper (3 credits).

PhD students would dedicate many study hours for these exams. This time can be more productively redirected towards learning about research methodology and exploration of their thesis topic.

Removal of ECON 613 and ECON 616 as prerequisites

The shift from comprehensive exams to a research paper emphasizes the development and application of independent research skills rather than mastery of course material.

Removing formal course prerequisites provides students with greater flexibility to pursue coursework most relevant to their research interests, while ensuring that competency is demonstrated through the research paper itself rather than prescribed course completion. ECON 613 and ECON 616 remain program requirements; however, their timing of completion is no longer essential to that of a non-exam-based ECON 8020.

Resource Implications:

There is a small cost associated with invigilating the comprehensive exams (about $250/year), plus the time to prepare and grade the exams.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change

Dossier Title: Economics 600-level course description and component updates

Calendar Section Name: ECON 8070

Calendar Section Type: Course

Description of Change: ECON 8070 Thesis New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Arts and Science Courses > Economics Courses > Economics MA and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ECON 8070 Thesis (45 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: ECON 806 .
Description :	*Description :*
	Doctoral students must submit a thesis, based on their own extensive research, which makes an original contribution to knowledge and defend it in an oral examination in accordance with the thesis regulations specified in the relevant section of this calendar.
Component(s):	*Component(s):*
	Thesis Research
Notes :	*Notes :*

Rationale:

This adjustment to the number of credits is required to reflect the replacement of ECON 802 Comprehensive Examination (4 credits) with ECON 8020 Research Paper (3 credits).

The path to the thesis will now be as follows:

1. Courses (18 credits)
2. ECON 696 (3 credits)
3. ECON 8020 Research Paper (3 credits)
4. ECON 804 Thesis Proposal (3 credits)
5. ECON 806 Research Seminar (6 credits)
6. ECON 8070 Thesis (45 credits)

This more structured approach is implemented to develop the students' research skills in a measured yet time-conscious way.

Resource Implications:

None.

Impact Report

Programs

Economics MA
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Arts and Science Programs -> Economics Programs -> Master/Magisteriate -> Economics MA -> Degree Requirements
Source of Impact

- ECON 612
- ECON 615
- ECON 680
- ECON 696

Economics PhD
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Arts and Science Programs -> Economics Programs -> Doctor/Doctorate -> Economics PhD -> Degree Requirements
Source of Impact

- ECON 612
- ECON 613
- ECON 615
- ECON 616
- ECON 680
- ECON 681
- ECON 696

Courses

ECON 613
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 612

ECON 6130 Microeconomics II New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 612

ECON 614
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 612

ECON 616
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 615

ECON 618
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 615

ECON 619
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 614
- ECON 615

ECON 643
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 642
- ECON 680

ECON 678
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 612
- ECON 680

ECON 681
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 680

ECON 682
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 680

ECON 683
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses
Source of Impact

- ECON 680

ECON 8020 Research Paper New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses

Source of Impact

- ECON 696

ECON 8070 Thesis New

Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Arts and Science Courses -> Economics Courses -> Economics MA and PhD Courses

Source of Impact

Proposal to Substitute Comprehensive Exams with a Research Paper Requirement

There is a growing trend in economics to question the relevance of comprehensive exams. This practice has been adopted at a number of institutions—for example, Stanford University in the U.S. and Carleton University in Canada, while others waive the requirement based on a minimum GPA in core courses, such as at the University of Virginia.

In practice, comprehensive exams often serve a role similar to an additional final exam. Some faculty and students see value in the way they consolidate knowledge, but this benefit is partly offset by the significant stress they create and their limited contribution beyond what coursework already provides. Most of our PhD students enter the program with an MA in economics, and the first-term courses already reinforce and solidify their knowledge. A structured research exercise would offer an alternative way to integrate that knowledge while placing greater emphasis on applying concepts and methods to original research. This approach represents a natural evolution of the program, aligning assessment more closely with the skills and outputs that define success in a PhD.

I therefore propose that the department eliminate comprehensive exams and replace them with a research component. Specifically, students would take ECON 696 – Research Methodology in Economics (3 credits) during the first summer of the program and submit a completed research paper in their second year under a new course designation—ECON 8020 (3 credits). The number of credits allocated to the PhD thesis would be adjusted from 46 to 45, reflecting the removal of the 4-credit comprehensive exams and the addition of ECON 696 and ECON 8020. This approach would engage students in research earlier, allow the department to evaluate their research potential rather than their exam performance, and reduce time to completion. It would also align with the summer seminar series for graduate students, which could serve as the culmination of this research exercise.

An additional indirect benefit of this reform is logistical. The Faculty of Arts & Science has asked us to address the persistent problem of low enrolments in our second-term PhD courses (ECON 613, 616, and 681). Offering these courses annually for only a handful of students is simply not sustainable. The proposed changes would give us greater flexibility—for instance, by allowing students to take equivalent courses at McGill without relying on McGill faculty to contribute to our comprehensive exams. This option, however, is not viable for ECON 613, which carries 4 credits rather than the standard 3. Another solution would be to offer these courses every two years rather than annually, thereby ensuring viable class sizes. While neither option is ideal, such measures may be necessary to preserve the integrity and long-term viability of the PhD program.

Including ECON 696 in the new requirements is also well justified. Over the years, I have allowed a few PhD students in need of extra electives to take the course, and the feedback has been consistently positive. For many, it provides their first structured experience writing an academic paper. The course offers a gradual but effective introduction to the research process: identifying ideas, developing research questions, formulating testable hypotheses, and becoming familiar with the revise-and-resubmit process.

Finally, ECON 8020 would also serve as an early screening tool to identify students who may struggle with thesis writing. Strong performance in coursework or written exams does not always translate into research ability, and we have had students with excellent GPAs who nonetheless faced difficulties completing their thesis in a timely manner, or at all. ECON 8020 can be evaluated on a pass/fail basis by a committee of faculty members in the relevant field. It is also reasonable to expect students to complete a research paper by the end of their second year, as this mirrors the expectations already placed on our MA students.

Taken together, these changes would modernize our program, shift the focus toward meaningful research engagement, and strengthen its long-term viability — times have changed, and practices followed simply because they were always done that way need to evolve.

Graduate Calendar updates: 600-level courses

- Simplify the MA program by removing unecessary prerequisites to help elective enrolment
- Update course names and descriptions to reflect actual course content
- Convert some 695 topic courses into numbered courses to reflect actual program
- Remove "legacy" courses (always have the flexibility to offer as topic)

Rationale:

- Simplify program progression and facilitate enrolment
- Show course offerings that reflect reality

Motion #1: That the changes to the course descriptions circulated in advance of Council be approved.

PhD program comprehensive assessment (amended from circulated proposal):

■ Remove the point-in-time, high-stake **exam-focused** comprehensive examinations requirement (currently 4 credits):	**-4**
■ Replace them by two new sustained **research-focused** requirements	
▫ ECON 696 – Research Methodology in Economics (3 credits), to be taken in the first summer of the program:	**+3**
▫ ECON 8020 – Research Paper (3 credits), to be completed by the end of second academic year:	**+3**
■ **Reduce ECON 613 from 4 to 3 credits, with a corresponding reduction in teaching hours**:	**-1**
■ Adjust PhD thesis credits from 46 to 45:	**-1**
	0

Rationale:

- Many universities are moving away from comps; the practice is increasingly outdated.
- Comps add stress but contribute little beyond coursework already completed, other than perhaps, reinforce knowledge
- A research paper better develops and tests the skills a PhD requires: Research is the real challenge of the PhD.
- Screening based on research abilities rather than exam writing abilities (comps failure rate past-covid: 0%)
- Give students earlier research engagement, integrates well with student seminar series.
- Provide flexibility to address low enrolments.
- Times have changed — tradition alone is not a sufficient rationale not to do anything. Adapt or disappear.
- **The extra game theory material currently covered in ECON 613 for the comprehensive exams can instead be taken up at another time in the elective course ECON 614.**

Motion #2: That the PhD program requirements be revised as circulated and amended above, replacing the comprehensive exams with a research-focused component.

Both motions were approved by the Economics Department Council on Wednesday, September 17, 2025.

ECON 620 – Monetary Economics

This course uses the New Keynesian framework to explore why money is valued, the objectives of monetary policy, and the evaluation of monetary policy effects, with tools such as constrained optimization and dynamic programming.

Learning objectives

By the end of this course, students will be able to:

- Explain the microfoundations of money demand and the role of nominal rigidities in monetary models.
- Formulate and solve dynamic optimization problems relevant to monetary policy design.
- Analyze the transmission mechanisms of monetary policy within the New Keynesian framework.
- Interpret and critically assess current research and policy debates in monetary economics.

Assessment

- Midterm exam (50%)
- Final exam (50%)

ECON 621 – Computational Economics

This course develops the skills and knowledge needed to formulate and solve dynamic economic models using advanced numerical techniques. These tools have become central to many areas of economics, enabling researchers to solve models that were previously intractable. The methods taught in this course are applicable to research in applied microeconomics, econometrics, and macroeconomics.

Learning objectives

By the end of this course, students will be able to:

- Develop and code dynamic economic models.
- Apply dynamic programming and iterative methods to solve optimization and equilibrium problems.
- Implement numerical techniques for solving nonlinear decision rules and simulating model dynamics.
- Construct and analyze general equilibrium models with heterogeneous agents and uncertainty.

Assessment

- Homework (30%)
- Midterm exam (30%)
- Final exam (40%)

ECON 627 – Game Theory

This course offers in-depth coverage of some important topics in mostly non-cooperative, but also cooperative, game theory. While formal reasoning, precise definitions, and proofs are part of the course, the emphasis is on interpreting and applying game-theoretic concepts in economics. Main topics include Nash equilibrium and subgame perfection, correlated equilibrium, rationalizability, repeated games, Bayesian games, the core, the Shapley value, and stable sets.

Learning objectives

By the end of this course, students will be able to:

- Formally model strategic interactions among rational decision-makers.
- Analyze equilibrium concepts in both non-cooperative and cooperative games.
- Apply game-theoretic tools to economic problems such as auctions and matching.
- Interpret and evaluate theoretical results using formal reasoning and proofs.
- Develop and communicate original ideas or research questions in game theory through written work.

Assessment

- Two term exams (2 x 25%, 50%)
- Homework (10%)
- Term paper (40%)

ECON 630 – Political Economics

This course examines the connection between individual preferences and the economic and political outcomes in democratic societies. It considers both the interaction of individuals and entities within given political processes and institutions, and how these processes and institutions are shaped by individual and societal interests. The course employs game-theoretic and information-theoretic tools for analysis. Topics covered include voting, election campaigns, legislative processes, political accountability, and political reforms, among others.

Learning objectives

By the end of this course, students will be able to:

- Formulate and analyze models of political and informational interactions using game theory.
- Explain how information and communication affect political decision-making and institutional outcomes.
- Apply formal modeling techniques to study issues in political accountability and policy design.

Assessment

- Presentation (50%)
- Term paper (50%)

ECON 631 – Auctions and Markets

This course explores the design of institutions and markets, with a focus on mechanism and market design. Primary emphasis is placed on mechanisms involving monetary transactions, with auctions as a key example. This interdisciplinary topic spans economics, operations research, and computer science. The course also covers mechanisms without monetary transfers and introduces the emerging field of information design.

Learning objectives

By the end of this course, students will be able to:

- Formulate and analyze mechanisms for resource allocation, auctions, and collective decision-making.
- Apply key concepts such as incentive compatibility, efficiency, and the revelation principle in economic design.
- Distinguish between mechanism design with and without monetary transfers and understand their practical implications.
- Critically evaluate research papers and their theoretical and applied contributions in mechanism design.

Assessment

- Presentation (15%)
- Homework (2 x 15%, 30%)
- Referee report (20%)
- Term paper (35%)

ECON 632 – Market Design

This course examines the design and analysis of markets that require a selection process and do not rely on prices. To understand how the organization of such markets affects their performance, several centrally administered mechanisms and their properties are discussed, including those used in real-world marketplaces. The course also explores the interplay between theory and practice, with applications to labor market clearinghouses, school choice programs, and the allocation of organs for transplantation.

Learning objectives

By the end of this course, students will be able to:

- Formulate and analyze resource allocation problems using the principles of economic design and game theory.
- Explain the key theoretical results underlying two-sided and one-sided matching mechanisms.
- Evaluate real-world applications of matching theory.
- Critically assess research papers and identify open questions in market design.

Assessment

- Presentation (30%)
- Homework (2 x 10%, 20%)
- Class participation (10%)
- Term paper (40%)

ECON 634 – Industrial Organization

This course introduces the theory of industrial organization, focusing on firm behavior in various market structures. It uses price theory and game-theoretic tools for this analysis. Topics include monopoly pricing, price discrimination, product differentiation, oligopoly, entry and exit, advertising, information disclosure, data privacy, and digital platforms.

Learning objectives

By the end of this course, students will be able to:

- Analyze firm behavior and market outcomes under various competitive structures using microeconomic and game-theoretic tools.
- Explain theoretical foundations of monopoly pricing, price discrimination, product differentiation, and strategic interaction among firms.
- Evaluate the effects of market entry, advertising, information, and data privacy on competition and welfare.

Assessment

- Homework (2 x 15%, 30%)
- Presentation (30%)
- Term paper (40%)

ECON 637 – Experimental Economics

This course introduces students to the basic methodology of experimental economics and discusses its applications in behavioral game theory, financial economics, public economics, labour economics, political economics, environmental economics, and decision theory.

Learning objectives

By the end of this course, students will be able to:

- Understand the methodological foundations and principles of experimental economics.
- Design and critically evaluate laboratory and field experiments in economics.
- Analyze how experimental methods contribute to understanding behavior in markets and strategic interactions.

Assessment

- Class participation (10%)
- Presentation (1 x 30% + 1 x 20%, 50%)
- Term paper (40%)

ECON 657 – Public Finance

This course examines how taxation and public expenditure policies shape economic behavior, including work-leisure choices and saving decisions. It evaluates optimal tax and spending designs for equity, efficiency, and fiscal sustainability. Emphasis is on analytical tools and policy applications.

Learning objectives

By the end of this course, students will be able to:

- Analyze how taxation and government spending influence individual and household economic behavior.
- Evaluate the efficiency, equity, and sustainability of different tax and expenditure policies.
- Apply analytical tools to assess optimal tax and public spending designs.
- Critically interpret policy applications and real-world fiscal decisions..

Assessment

- Homework (20%)
- Midterm Exam (30%)
- Final exam (50%)

ECON 6901 Applied Machine Learning for Economics

This course introduces students to machine learning methods and their applications in economics. The focus is on supervised learning, with an emphasis on predictive methods. Topics include high-dimensional regression and classification, splines, tree-based methods, support vector machines, and deep learning. Selected aspects of causal machine learning are also covered.

Learning objectives

By the end of this course, students will be able to:

- Formulate and implement supervised machine learning models for prediction and classification tasks using R.
- Apply model selection, regularization, and validation techniques (cross-validation, bootstrap) to high-dimensional data.
- Compare and evaluate the performance of parametric, nonparametric, and ensemble learning methods.
- Critically analyze research applications of machine learning in economics and data science through a term project.

Assessment

- Assignments (3): 20%
- Midterm Exam: 20%
- Final Exam: 20%
- Term project: 40%

Summary of changes, course numbering & credit value: ECON-5838

New course number	New title	New credit value	Previous course number	Previous title	Previous credit value
ECON 6130	Microeconomics II	3	ECON 613	Microeconomics II	4
ECON 620	Monetary Economics	3	ECON 618	Monetary Economics	3
ECON 621	Computational Economics	3	ECON 695	Special Topics: Computational Economics	3
ECON 627	Game Theory	3	ECON 614	Game Theory	3
ECON 630	Political Economics	3	ECON 619	Political Economy	3
ECON 631	Auctions and Markets	3	ECON 695	Special Topics: Auctions and Markets	3
ECON 632	Market Design	3	ECON 695	Special Topics: Market Design	3
ECON 634	Industrial Organization	3	ECON 673	Industrial Organization	3
ECON 637	Experimental Economics	3	ECON 695	Special Topics: Experimental Economics	3
ECON 657	Public Finance	3	ECON 657	Public Finance: Taxation	3
ECON 6901	Applied Machine Learning in Economics	3	ECON 690	Mathematical Economics	3
ECON 8020	Research Paper	3	ECON 802	Comprehensive Examination	4
ECON 8070	Thesis	45	ECON 807	Thesis	46

Graduate Program Regular Curriculum Change - JMSB-MSCA-5968 - VERSION : 3

Summary and Rationale for Changes

The following proposed changes were approved by the Department of Finance at its meeting on September 24, 2025, and by FAPC on January 16, 2026. Because these changes did not require Faculty Council approval, they were shared with the Council for information only at its meeting on January 30, 2026. And is now submitted for GCC consideration at the meeting on February 16, 2026.

1. MSCA 601: Financial Economics from a core requirement to an elective for two years

Rationale:
Given the placement outcomes of our MSc Finance graduates, who overwhelmingly pursue careers in industry rather than PhD studies, it is appropriate to remove MSCA 601 from the program's core requirements. MSCA 601 is primarily designed to prepare students for advanced academic research, emphasizing mathematical rigor and theoretical depth beyond what is typically required in industry roles. By making this course optional rather than compulsory, we free up room in the curriculum for more applied, industry-relevant electives that better match employers' expectations and our students' career goals. Students with a genuine interest in doctoral studies would still be able to select MSCA 601 as an elective.

2. Course description changes:

MSCA 623: Seminar in Financial Theory and Corporate Policy
MSCA 624: Seminar in Mergers, Restructuring, and Corporate Control
MSCA 625: Seminar in Options and Futures
MSCA 632: Seminar in Special Topics in Finance

Rationale:
These course descriptions were missing from the Graduate Calendar.

Resource Implications

None.

Graduate Program Regular Curriculum Change - JMSB-MSCA-5968 - VERSION : 3

Summary of Committee Discussion: APC approval

For Submission to:

N/A, N/A,
N/A,

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 17 Mar 2026

APC recommended consulting with the unit to determine whether all of the courses in this dossier require prerequisites to be added. For example, a prerequisite such as “Enrolment in the program is required.”

Response from the Department: Courses in this program should not have prerequisites listed. Requiring a prerequisite that "Enrollment in this program is required" risks providing a barrier to entry for non-finance MSc students. While we could indicate "Enrollment in the MSc program is required" , it seems rather obvious and we do not typically list such obvious prerequisites (e.g., we do not indicate that enrollment in the undergraduate program is required for undergraduate classes).

APC recommended to spell out the acronyms under course MSCA 623.

Response from the Department: The acronyms IPO and CEO should remain as is, without defining them explicitly. We both feel that such acronyms are extremely basic and should be understood by anyone thinking of taking this course.

APC Final approved dossier JMSB-MSCA-5968; APC-2026-2-D3.

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 3 D9). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Programs and Development,
Graduate Curriculum Committee, 16 Feb 2026

Approved by:

Sandra Betton, Associate Dean, Professional Graduate Programs,
Faculty Academic Programs Committee, 16 Jan 2026

Please find attached the proposal to change the MSCA Finance course changes. The JMSB Faculty Academic Programs Committee (FAPC) approved these changes on January 16, 2026. Since Faculty Council has delegated approval privileges to FAPC (with the exception of major changes) this dossier was only shared to Faculty Council but not submitted for approval at their meeting scheduled on January 30, 2026. I kindly request that the proposed changes be presented for consideration at the Graduate Curriculum Committee meeting on February 16, 2026.

Summary of Committee Discussion: FCC/FAPC Approval

For Submission to:

Anne-Marie Croteau, Dean, John Molson School of Business,
Faculty Council, 30 Jan 2026

Approved by:

Sandra Betton, Associate Dean, Professional Graduate Programs,
Faculty Academic Programs Committee, 16 Jan 2026

Please find attached the proposal to change the MSCA Finance course changes. The JMSB Faculty Academic Programs Committee (FAPC) approved these changes on January 16, 2026. Since Faculty Council has delegated approval privileges to FAPC (with the exception of major changes) this dossier was only shared to Faculty Council but not submitted for approval at their meeting scheduled on January 30, 2026. I kindly request that the proposed changes be presented for consideration at the Graduate Curriculum Committee meeting on February 16, 2026.

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
MSCA 623 Seminar in Financial Theory and Corporate Policy Change				✎					✎	
MSCA 624 Seminar in Mergers, Restructuring, and Corporate Control Change				✎					✎	
MSCA 625 Seminar in Options and Futures Change				✎					✎	
MSCA 632 Seminar in Special Topics in Finance Change				✎		✎				

Program Changes:

	Suspend Admissions	Program Degree Type Change	Program Title Change	Program Require-ments Change	Change to Program Type	Change to Total Credit Value of Program	Change to Primary Campus
Finance MSc Change				✎			

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: MSCA - Finance courses changes

Calendar Section Name: Finance MSc
Calendar Section Type: Program
Description of Change: Finance MSc Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Master of Science Administration
Program Name: Finance MSc
Program Type: Thesis
Degree: MSc

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > John Molson School of Business Programs > Master/Magisteriate > Master of Science (MSc) > Finance MSc > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
45 credits	Finance MSc	**45 credits**	Finance MSc
	~~9~~ credits of Core Courses: ~~MSCA 601 Financial Economics (3)~~ MSCA 610 Financial Data Analytics (3) MSCA 617 Financial Data Analytics II (3) MSCA 655 Professional Development (0) ~~15~~ credits chosen from Elective Finance Seminars list. Upon approval of the Graduate Program Director and the instructor, up to six credits of electives may include the following: - Seminars in any other JMSB MSc program; - Finance Specialization: Business Administration PhD ; - Cognate graduate seminars offered by other departments within the university. 21 credits: MSCA 699 Research Thesis (21)		6 credits of Core Courses: MSCA 610 Financial Data Analytics (3) MSCA 617 Financial Data Analytics II (3) MSCA 655 Professional Development (0) 18 credits chosen from Elective Finance Seminars list. Upon approval of the Graduate Program Director and the instructor, up to six credits of electives may include the following: - Seminars in any other JMSB MSc program; - Finance Specialization: Business Administration PhD ; - Cognate graduate seminars offered by other departments within the university. 21 credits: MSCA 699 Research Thesis (21)

Rationale:

Given the clear placement outcomes of our MSc Finance graduates, who overwhelmingly pursue careers in industry rather than PhD studies, it is appropriate to **remove MSCA 601 from the program's core requirements**. MSCA 601 is primarily designed to prepare students for

advanced academic research, emphasizing mathematical rigor and theoretical depth beyond what is typically required in industry roles. By making this course optional rather than compulsory, we free up room in the curriculum for more applied, industry-relevant electives (e.g., risk management, machine learning in finance, or sustainable finance) that better match employers' expectations and our students' career goals. Students with a genuine interest in doctoral studies would still be able to select MSCA 601 as an elective, while the core would more efficiently serve the majority of students for whom strong applied skills and professional readiness are the primary objectives.

Resource Implications:

None. While this course will no longer be mandatory, it will remain an elective. Other electives will receive higher enrollment, but many are already far below capacity.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: MSCA - Finance courses changes

Calendar Section Name: MSCA 623
Calendar Section Type: Course
Description of Change: MSCA 623 Seminar in Financial Theory and Corporate Policy Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Master of Science Administration

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Master's Level Courses > MSc Finance, Management, Marketing, and Business Analytics and Technology Management (MSCA) Courses > MSc Finance Seminars

Type of Change: Course Change

Present Text calendar	Proposed Text
MSCA 623 Seminar in Financial Theory and Corporate Policy (3 credits)	MSCA 623 Seminar in Financial Theory and Corporate Policy (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* This course provides a conceptual and analytical foundation in corporate finance, emphasizing both theoretical understanding and real-world applications. Students explore key topics including capital structure, dividend policy, corporate social responsibility, corporate governance, market efficiency, IPOs, executive compensation, CEO turnover, and mergers and acquisitions. Through diverse learning materials and an emphasis on independent inquiry, the course prepares students to conduct research across a range of corporate finance areas.
Component(s):	*Component(s):*
Seminar	Seminar
Notes :	*Notes :*

Rationale:
This course was missing a calendar course description.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: MSCA - Finance courses changes

Calendar Section Name: MSCA 624
Calendar Section Type: Course
Description of Change: MSCA 624 Seminar in Mergers, Restructuring, and Corporate Control Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Master of Science Administration

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Master's Level Courses > MSc Finance, Management, Marketing, and Business Analytics and Technology Management (MSCA) Courses > MSc Finance Seminars

Type of Change: Course Change

Present Text calendar	Proposed Text
MSCA 624 Seminar in Mergers, Restructuring, and Corporate Control (3 credits)	MSCA 624 Seminar in Mergers, Restructuring, and Corporate Control (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* Students are exposed to both the practice and theory of mergers and acquisitions. Topics may include valuation, regulation, sources and divisions of gains, and the role of the market for corporate control in managerial discipline. By the end of the course, students are able to critically evaluate research, formulate interesting and original hypotheses regarding mergers and acquisitions, design and carry out an appropriate empirical analysis and present their results in a professional manner.
Component(s): Seminar	*Component(s):* Seminar
Notes :	*Notes :*

Rationale:
This course is missing a calendar course description.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: MSCA - Finance courses changes

Calendar Section Name: MSCA 625
Calendar Section Type: Course
Description of Change: MSCA 625 Seminar in Options and Futures Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Master of Science Administration

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Master's Level Courses > MSc Finance, Management, Marketing, and Business Analytics and Technology Management (MSCA) Courses > MSc Finance Seminars

Type of Change: Course Change

Present Text calendar	Proposed Text
MSCA 625 Seminar in Options and Futures (3 credits)	MSCA 625 Seminar in Options and Futures (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
	This course examines financial derivatives, with a particular focus on options and futures. In the first part of the course, students study the key characteristics of these instruments and learn to price them using arbitrage theory. In the second part, students explore how investors hedge and speculate using options and futures, and how these instruments are used to manage a range of risks. Although the topics are quantitative in nature, the primary emphasis is on developing an intuitive understanding of the underlying concepts. Students evaluate derivatives research.
Component(s):	*Component(s):*
Seminar	Seminar
Notes :	*Notes :*

Rationale:
This course is missing a calendar course description.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: MSCA - Finance courses changes

Calendar Section Name: MSCA 632
Calendar Section Type: Course
Description of Change: MSCA 632 Seminar in Special Topics in Finance Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Master of Science Administration

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Master's Level Courses > MSc Finance, Management, Marketing, and Business Analytics and Technology Management (MSCA) Courses > MSc Finance Seminars

Type of Change: Course Change

Present Text calendar	Proposed Text
MSCA 632 Seminar in Special Topics in Finance (3 credits)	MSCA 632 Seminar in Special Topics in Finance (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~More than one topic can be offered under this course. In such cases, the name~~ of ~~the topic will be indicated on the class schedule (under Topic e.g. Financial institutions).~~	This seminar is an in-depth examination of new and distinct topics in finance.
Component(s):	*Component(s):*
Seminar	Seminar
Notes :	*Notes :*
Allow this course to be taken more than one time for credit :	**Allow this course to be taken more than one time for credit :** The subject matter for this course will vary from term to term and students may take this course more than once, provided that the content has changed.

Rationale:

The current description has been modified to provide greater clarity.

This change is not subject to the regular curriculum process. It is considered a minor editorial change.

Resource Implications:
None.

Impact Report

Defined Groups

Elective Finance Seminars

Graduate -> See Summer 2026 Graduate Calendar -> Programs -> John Molson School of Business Programs -> Master/Magisteriate -> Master of Science (MSc) -> Finance MSc -> Degree Requirements -> Finance MSc
Source of Impact

- MSCA 623
- MSCA 624
- MSCA 625
- MSCA 632

Master of Supply Chain Management Electives

Graduate -> See Summer 2026 Graduate Calendar -> Programs -> John Molson School of Business Programs -> Master/Magisteriate -> Supply Chain Management MSCM -> Degree Requirements -> Master of Supply Chain Management
Source of Impact

- MSCA 625
- MSCA 632

Regulations

Current Programs

Graduate -> See Summer 2026 Graduate Calendar -> Programs -> John Molson School of Business Programs -> JMSB Co-operative Programs
Source of Impact

- Finance MSc

MSc

Graduate -> See Summer 2026 Graduate Calendar -> Programs -> John Molson School of Business Programs -> Master/Magisteriate -> Master of Science (MSc)
Source of Impact

- Finance MSc

INTERNAL MEMORANDUM

To: Dr. Juliane Proelss, Chair, Department of Finance
From: Dr. Frederick Davis, MSc Finance Program Director
Date: December 8, 2025
Subject: MSCA 601, MSCA 623, MSCA 624, MSCA 625 and MSCA 632

Summary of Rationale

The following proposed changes were developed and reviewed with relevant faculty members involved in the MSCA curriculum, including those teaching in the program and members of the MSc sub-committee, and were subsequently approved by the Department of Finance at the departmental meeting on September 24, 2025, to be reflected in the graduate calendar for the 2026–2027 academic year and beyond. I kindly request that the proposed changes be presented for consideration at the Faculty Academic Program Committee's next available opportunity.

1. **Changing *MSCA 601: Financial Economics* from a core requirement to an elective for two years**
   Rationale:
   Given the placement outcomes of our MSc Finance graduates, who overwhelmingly pursue careers in industry rather than PhD studies, it is appropriate to **remove MSCA 601 from the program's core requirements.** MSCA 601 is primarily designed to prepare students for advanced academic research, emphasizing mathematical rigor and theoretical depth beyond what is typically required in industry roles. By making this course optional rather than compulsory, we free up room in the curriculum for more applied, industry-relevant electives that better match employers' expectations and our students' career goals. Students with a genuine interest in doctoral studies would still be able to select MSCA 601 as an elective.

2. **Course description changes:**
   a) ***MSCA 601: Financial Economics***
   b) ***MSCA 623: Seminar in Financial Theory and Corporate Policy***
   c) ***MSCA 624: Seminar in Mergers, Restructuring, and Corporate Control***
   d) ***MSCA 625: Seminar in Options and Futures***
   e) ***MSCA 632: Seminar in Special Topics in Finance***

   Rationale:
   These course descriptions were missing from the Graduate Calendar.

Sincerely,



Frederick Davis
Associate Professor of Finance
MSc Finance Program Director
John Molson School of Business, Concordia University

Graduate Program Regular Curriculum Change - FA-ARTH-5913 - VERSION : 4

Summary and Rationale for Changes

This dossier proposes the addition of a note to the graduate course ARTH 679 Curatorial Project within the Graduate Certificate in Curatorial Studies and Practices, offered in the Department of Art History.

The department proposes adding the note, “This course is assessed on a pass/fail basis”.

The curatorial practicum is best evaluated on a Pass/Fail basis for various reasons. First and foremost, the graduate certificate serves a diverse group of learners—including professionals and mature students returning to academia—whose work in the practicum is grounded in applied experimentation in the field rather than competitive academic assessment. Host institutions will vary widely in size and capacity, from large museums to small art venues, and many on site supervisors are not equipped to produce detailed academic evaluations, making letter grades potentially inconsistent and unreliable. Instead, hosts can meaningfully confirm with Concordia faculty whether students have met the overall goals agreed to at the outset of the practicum. A Pass/Fail structure also reduces the risk of grade confusion or appeals. It furthermore aligns this course with existing internship courses offered in Art History at both undergraduate and graduate levels. Finally, it reflects the scaffolded structure of ARTH 678 and ARTH 679, in which the graded Winter course assesses academic preparation while the practicum assesses successful completion of the approved curatorial project.

Throughout the course, students will continue to receive feedback throughout to highlight their strengths and areas to keep working on.

Resource Implications

none.

Graduate Program Regular Curriculum Change - FA-ARTH-5913 - VERSION : 4

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 3 D7). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Dr. Jordan LeBel, Associate Dean, School of Graduate Studies,
Graduate Curriculum Committee, 16 Feb 2026

Approved by:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 16 Jan 2026

This dossier was presented and approved at Faculty Council at their meeting on January 16, 2026. We hereby submit the dossier for the consideration of the Graduate Curriculum Committee at their meeting on February 16, 2026.

There are no resource implications.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 12 Dec 2025

Approved by:

Dr. Shauna Janssen, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 05 Nov 2025

The Faculty Curriculum Committee reviewed and approved of the change proposed in this dossier on November 5, 2025.

We therefore submit the dossier for the review of the Fine Arts Faculty Council at their meeting on December 12, 2025.

There are no resource implications.

Summary of Committee Discussion: Department approval

For Submission to:

Dr. Shauna Janssen, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 05 Nov 2025

Approved by:

Dr. Nicola Pezolet, Dept. Chair,
Department Curriculum Committee, 26 Sep 2025

Members of the Department Curriculum Committee, notably, the Graduate Curatorial Programs Steering Committee, voted on Sept. 26th to make ARTH 679 a pass/fail evaluation.

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ARTH 679 Curatorial Project Change										

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: ARTH 679: Pass/Fail note

Calendar Section Name: ARTH 679
Calendar Section Type: Course
Description of Change: ARTH 679 Curatorial Project Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Art History Courses > Curatorial Studies and Practices Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ARTH 679 Curatorial Project (3 credits)	ARTH 679 Curatorial Project (3 credits)
Prerequisites:	*Prerequisites:*
The following courses must be completed previously: ARTH 676 , ARTH 677 , ARTH 678 .	The following courses must be completed previously: ARTH 676 , ARTH 677 , ARTH 678 .
Description :	*Description :*
Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.	Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*
Non-standard assessment note :	**Non-standard assessment note :** This course is assessed on a pass/fail basis.

Rationale:
As the ARTH 679 course is a practicum course that may be done in different spaces, institutions, and locations, with varying materials, the Graduate Curatorial Program Committee has voted to change this evaluation of this course to a simple Pass/Fail in order to better facilitate evaluations.

Resource Implications:
No resources are implicated in this change.

D1

Impact Report

Programs

Curatorial Studies and Practices Graduate Certificate

Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Art History Programs -> Graduate Certificate -> Curatorial Studies and Practices Graduate Certificate -> Degree Requirements

Source of Impact

- ARTH 679

Courses

ARTH 678

Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Art History Courses -> Curatorial Studies and Practices Courses

Source of Impact

- ARTH 679

historical aspects of curatorial practice from an array of perspectives such as, but not limited to, Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies including cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics will vary depending on the expertise of the faculty member.

Component(s):

Seminar

ARTH 677 Advanced Topics in Curatorial Practice and Theory (3 credits)

Prerequisite/Corequisite:

The following course must be completed previously: ARTH 676

Description:

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, anti-oppression, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics will vary depending on the expertise of the faculty member.

Component(s):

Seminar

ARTH 678 Exhibition Concept Design (3 credits)

Prerequisite/Corequisite:

The following course must be completed previously: ARTH 676 . The following course must be taken previously or concurrently: ARTH 677

Description:

This course focuses on the research and planning process of a significant project that can be actualized in ARTH 679: Curatorial Project, or later in their career. In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

Component(s):

Seminar

ARTH 679 Curatorial Project (3 credits)

Prerequisite/Corequisite:

The following courses must be completed previously: ARTH 676 , ARTH 677 , ARTH 678 .

Description:

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

Component(s):

Practicum/Internship/Work Term

Notes:

- This course is assessed on a pass/fail basis.

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Graduate Program Regular Curriculum Change - FA-CATS-5737 - VERSION : 6

Summary and Rationale for Changes

This dossier contains curriculum changes that affect four graduate programs: (1) MA in Creative Arts Therapies, Art Therapy Option; (2) MA in Creative Arts Therapies, Drama Therapy Option; (3) MA in Creative Arts Therapies, Music Therapy: Advanced Clinical Practice Option and Research Thesis Option; and (4) Graduate Diploma in Music Therapy. These changes are intended to remove courses that no longer align with our pedagogical and evaluation approaches, for which we no longer have specialized expertise, or for which curricular outcomes are covered in related equivalent courses. Changes to course descriptions are intended to provide clarity to students and external program approval bodies about course content, accurately represent updated and more current course content, specifically articulate adherence to the art therapy and drama therapy professional scopes of practice, and reflect current focus on experiential learning. Changes in course and program descriptions also reflect changes in program approval bodies for both art therapy and music therapy pre-professional training.

Program Changes

MA in Creative Arts Therapies(Art Therapy and Drama Therapy Options)

1. Deleting the applied research project stream which includes CATS 698: Applied Research Paper with Report (6 credits) and CATS 699: Comprehensive Examination (3 credits). This culminating research paper option and the accompanying required comprehensive examination has not been offered for more than 15 years because the department has intentionally moved away from examinations as a mode of learning assessment. The research outcomes are covered in CATS 689: Research Paper (9 credits) for both art therapy and drama therapy students. Research skills and knowledge are also covered in CATS 691: Research in the Creative Arts Therapies (3 credits), ATRP 693: Research in Art Therapy (3 credits), and DTHY 693: Research in Drama Therapy (3 credits).

2. Deleting the research paper stream and adding the one course it contains - CATS 689, research paper (9 credits), to the core course group.

Changes to Admission Requirements/Program Description

Graduate Diploma in Music Therapy

We propose a change to the Graduate Diploma in Music Therapy admission requirements, specifically to the audition component, to diversify the audition requirements so that applicants from an array of musical backgrounds can audition and have their skills fairly assessed and recognized.

MA in Creative Arts Therapies (Art Therapy Option)

Removal of the American Art Therapy Association as a program approval body from the program description. The Department of Creative Arts Therapies did not renew its status with this organization after 2020 because the Canadian Art Therapy Association now has a robust program approval process.

Courses

Course Description Change to 14 Courses

The first set of changes relate to the necessary updating of course descriptions to ensure that our focus is

clearly on the development of counselling skills in the creative arts therapies (CATS 611: Counselling Skills for Creative Arts Therapists (3 credits)) and to ensure that our course descriptions accurately describe curricular focus on the application of art therapy practices in specific settings (ATRP 613: Art Therapy Practicum Supervision I (3 credits) and ATRP 623: Advanced Art Therapy Practicum Supervision I (3 credits)) and drama therapy practices in specific settings (DTHY 613: Drama Therapy Practicum Supervision I (3 credits) and DTHY 623: Advanced Drama Therapy Practicum Supervision I (3 credits)). Changes to the DTHY 600: Current Approaches to Drama Therapy (3 credits) course description reflect the inclusion of and focus on more current literature and drama therapy approaches.

In music Therapy, there are some key changes to the course descriptions of the following practicum courses: MTHY 510: Music Therapy Practicum I (3 credits); MTHY 511: Music Therapy Practicum II (3 credits); and MTHY 512: Music Therapy Practicum III (9 credits). The first changes reflect the shift from a population-based placement to a setting that often includes work with a variety of people across the lifespan. The second key change removes the American Music Therapy Association as one of the program approval bodies. This program approval is no longer required – our graduates can now write the US-based Certification Board for Music Therapists Exam as part of the certification process facilitated by the Canadian Association of Music Therapists. We also propose adding text to the course descriptions regarding group, individual, and dyad supervision to clarify for students and approval bodies that it occurs within the course. We also recommend removing the requirement that MTHY 503 and MTHY 504 must be taken concurrently with MTHY 510 and MTHY 511 as we no longer teach in a population-based model; we focus on the development of core competencies that are relevant with people of all ages; and we support that competency development within the context of the students' specific practicum placements. Changes to the MTHY 501: Music Therapy Skills (3 credits) course description reflect an updated focus on competencies and techniques in alignment with Certification standards. Finally, changes to the course descriptions for MTHY 602: Advanced Clinical Improvisation in Music Therapy (1.5 credits) and MTHY 603: Advanced Clinical Improvisation in Music Therapy II (1.5 credits) more accurately reflect the experiential nature of the courses.

We also propose the deletion of a number of elective courses that were designed by former faculty with specialized expertise that is no longer available in the department (CATS 638: Creative Process in Clinical Practice for Creative Arts Therapists (3 credits) and CATS 640: Studio Media and Practice for Creative Arts Therapists (3 credits)), that are not necessary to maintain as separate courses because a 3-credit special topics course code has been created (CATS 615: Independent Practicum in the Creative Arts Therapies (3 credits)), that have learning outcomes that are entirely covered in newly developed required courses (CATS 645: Family Systems and the Creative Arts Therapies (3 credits)), or that are offered across Canada through external training institutes for advanced practice training and, therefore, are no longer viable (MTHY 625: Guided Imagery and Music, Level I (3 credits)).

Resource Implications

None.

Graduate Program Regular Curriculum Change - FA-CATS-5737 - VERSION : 6

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 3 D8). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Dr. Jordan LeBel, Associate Dean, School of Graduate Studies,
Graduate Curriculum Committee, 16 Feb 2026

Approved by:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 16 Jan 2026

This dossier was presented and approved at Faculty Council at their meeting on January 16, 2026. We hereby submit the dossier for the consideration of the Graduate Curriculum Committee at their meeting on February 16, 2026.

There are no resource implications.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 12 Dec 2025

Approved by:

Dr. Shauna Janssen, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 05 Nov 2025

The Faculty of Fine Arts Curriculum Committee reviewed and approved this dossier with some minor edits at their meeting on November 5, 2025. We hereby submit the dossier for the consideration of Faculty Council at their December 12 meeting.

There are no resource implications.

Summary of Committee Discussion: Department approval

For Submission to:

Shauna Janssen, Associate Dean, Academic Programs and Pedagogy,
FCC, 10 Sep 2025

Approved by:

Cynthia Bruce, Chair, Department of Creative Arts Therapies,
Creative Arts Therapies Department Council, 19 Nov 2024

The CATS-5737 dossier was reviewed and approved the by the Department of Creative Arts Therapies DCC on November 12, 2024 and DC on November 19, 2024. We hereby submit the dossier to the Faculty Curriculum Committee for consideration at their September 2025 meeting. There are no resource implications.

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ATRP 600 Readings in Art Therapy Change				✎						
ATRP 613 Art Therapy Practicum Supervision I Change				✎						
ATRP 623 Advanced Art Therapy Practicum Supervision I Change				✎						
CATS 611 Counselling Skills for Creative Arts Therapists Change				✎				✎		
CATS 615 Independent Practicum in the Creative Arts Therapies Delete	⊗	⊗	⊗	⊗	⊗		⊗	⊗	⊗	
CATS 638 Creative Process in Clinical Practice for Creative Arts Therapists Delete	⊗	⊗	⊗	⊗			⊗	⊗	⊗	
CATS 640 Studio Media and Practice for Creative Arts Therapists Delete	⊗	⊗	⊗	⊗			⊗	⊗	⊗	
CATS 645 Family Systems and the Creative Arts Therapies Delete	⊗	⊗	⊗	⊗			⊗	⊗	⊗	
CATS 691 Research in the Creative Arts				✎				✎		

Therapies Change										
CATS 698 Applied Research Project with Report Delete	⊗	⊗	⊗	⊗			⊗	⊗	⊗	
CATS 699 Comprehensive Exam Delete	⊗	⊗	⊗	⊗			⊗	⊗	⊗	
DTHY 600 Current Approaches to Drama Therapy Change				✎						
DTHY 613 Drama Therapy Practicum Supervision I Change				✎						
DTHY 623 Advanced Drama Therapy Practicum Supervision I Change				✎						
MTHY 501 Music Therapy Skills Change				✎				✎		
MTHY 510 Music Therapy Practicum I Change				✎	✎					
MTHY 511 Music Therapy Practicum II Change				✎	✎					
MTHY 512 Music Therapy Practicum III Change				✎						
MTHY 602 Advanced Clinical Improvisation in Music Therapy I Change				✎						
MTHY 603 Advanced Clinical Improvisation in Music Therapy II Change				✎						
MTHY 625 Guided Imagery and Music, Level I Delete	⊗	⊗	⊗	⊗			⊗	⊗	⊗	

Program Changes:

	Suspend Admissions	Program Degree	Program Title	Program Require-	Change to Program	Change to Total	Change to Primary

		Type Change	Change	ments Change	Type	Credit Value of Program	Campus
Creative Arts Therapies (Art Therapy Option) MA Change							
Creative Arts Therapies (Drama Therapy Option) MA Change							

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Applied Research Project: Creative Arts Therapies (Art Therapy Option) Change			
Applied Research Project: Creative Arts Therapies (Art Therapy Option) Delete			
Research Paper: Creative Arts Therapies (Art Therapy Option) Delete			
Research Paper Creative Arts Therapies (Drama Therapy Option) Delete			
Applied Research Project: Creative Arts Therapies (Drama Therapy Option) Delete			

Regulation Changes:

- Additional Degree Requirements Change
- Admission Requirements Change

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Applied Research Project: Creative Arts Therapies (Art Therapy Option)
Calendar Section Type: Defined group
Description of Change: Applied Research Project: Creative Arts Therapies (Art Therapy Option) Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Art Therapy Option) MA > Degree Requirements > Creative Arts Therapies (Art Therapy Option) MA

Type of Change: Defined Group Change

Present Text calendar	Proposed Text
9 credits Applied Research Project: Creative Arts Therapies (Art Therapy Option) ~~9 credits:~~ ~~CATS 698 Applied Research Project with Report (6)~~ ~~CATS 699 Comprehensive Exam (3)~~	**9 credits** Applied Research Project: Creative Arts Therapies (Art Therapy Option)

Rationale:
The Department of Creative Arts Therapies has, pedagogically, moved away from formal examinations as modes of assessment and toward modes of assessment that offer students a diverse array of opportunities to demonstrate and consolidate their learning. In this instance, learning related to research is covered in CATS 691: Research in the Creative Arts Therapies and in DTHY 693: Research in Drama Therapy; and, that learning is mobilized in CATS 689: Research Paper.

Resource Implications:
There are no resource implications.

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Creative Arts Therapies (Art Therapy Option) MA
Calendar Section Type: Program
Description of Change: Creative Arts Therapies (Art Therapy Option) MA Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies
Program Name: Creative Arts Therapies (Art Therapy Option) MA
Program Type: Course-based
Degree: MA

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Art Therapy Option) MA > Degree Requirements

Type of Change: Program Change

Present Text calendar		Proposed Text	
60 credits	Creative Arts Therapies (Art Therapy Option) MA	**60 credits**	Creative Arts Therapies (Art Therapy Option) MA
	~~45~~ credits of Core Courses: ATRP 600 Readings in Art Therapy (3) ATRP 602 Assessment Techniques in Art Therapy (3) ATRP 603 Symbolic Imagery and Art Therapy - Studio/Workshop (3) ATRP 604 Group and Family Art Therapy (3) CATS 610 Introduction to Topics in Clinical Psychology for Creative Arts Therapists (3) CATS 611 Counselling Skills for Creative Arts Therapists (3) ATRP 613 Art Therapy Practicum Supervision I (3) ATRP 614 Art Therapy Practicum Supervision II (3) ATRP 620 Art Therapy Advanced Clinical Skills (3) ATRP 623 Advanced Art Therapy Practicum Supervision I (3) ATRP 624 Advanced Art Therapy Practicum Supervision II (3) ATRP 630 Child and Adolescent Art Therapy (3) CATS 639 Interdisciplinary Topics: Cross-cultural Competence in the Creative Arts Therapies (1) CATS 641 Interdisciplinary Topics: Ethics in Clinical Practice in the Creative Arts Therapies (1) CATS 643 Interdisciplinary Topics: Ethics in Research in the Creative Arts Therapies (1) CATS 691 Research in the Creative Arts Therapies (3) ATRP 693 Research in Art Therapy (3)		54 credits of Core Courses: ATRP 600 Readings in Art Therapy (3) ATRP 602 Assessment Techniques in Art Therapy (3) ATRP 603 Symbolic Imagery and Art Therapy - Studio/Workshop (3) ATRP 604 Group and Family Art Therapy (3) CATS 610 Introduction to Topics in Clinical Psychology for Creative Arts Therapists (3) CATS 611 Counselling Skills for Creative Arts Therapists (3) ATRP 613 Art Therapy Practicum Supervision I (3) ATRP 614 Art Therapy Practicum Supervision II (3) ATRP 620 Art Therapy Advanced Clinical Skills (3) ATRP 623 Advanced Art Therapy Practicum Supervision I (3) ATRP 624 Advanced Art Therapy Practicum Supervision II (3) ATRP 630 Child and Adolescent Art Therapy (3) CATS 639 Interdisciplinary Topics: Cross-cultural Competence in the Creative Arts Therapies (1) CATS 641 Interdisciplinary Topics: Ethics in Clinical Practice in the Creative Arts Therapies (1) CATS 643 Interdisciplinary Topics: Ethics in Research in the Creative Arts Therapies (1) CATS 691 Research in the Creative Arts Therapies (3) ATRP 693 Research in Art Therapy (3) CATS 689 Research Paper (9)

D2

Present Text calendar	Proposed Text
6 credits of Elective Courses chosen in consultation with an academic faculty advisor, are required of all candidates. With the approval of the Chair of Creative Arts Therapies and that of the cooperating department, some or all of the elective credits may be chosen from other graduate programs in the Faculty of Fine Arts, in other faculties at Concordia, or other universities. ~~9 credits chosen from one of the following:~~ ~~Research Paper Stream: Creative Arts Therapies (Art Therapy Option)~~ ~~Applied Research Project Stream: Creative Arts Therapies (Art Therapy Option)~~	6 credits of Elective Courses chosen in consultation with an academic faculty advisor, are required of all candidates. With the approval of the Chair of Creative Arts Therapies and that of the cooperating department, some or all of the elective credits may be chosen from other graduate programs in the Faculty of Fine Arts, in other faculties at Concordia, or other universities.

Rationale:

The Department of Creative Arts Therapies has, pedagogically, moved away from formal examinations as modes of assessment and toward modes of assessment that offer students a diverse array of opportunities to demonstrate and consolidate their learning. In this instance, learning related to research is covered in CATS 691: Research in the Creative Arts Therapies and in ATRP 693: Research in Art Therapy; and, that learning is mobilized in CATS 689: Research Paper

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Applied Research Project: Creative Arts Therapies (Art Therapy Option)
Calendar Section Type: Defined group
Description of Change: Applied Research Project: Creative Arts Therapies (Art Therapy Option) Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Art Therapy Option) MA > Degree Requirements > Creative Arts Therapies (Art Therapy Option) MA

Type of Change: Defined Group Deletion

Present Text calendar	Proposed Text
~~9~~ **credits** ~~Applied Research Project: Creative Arts Therapies (Art Therapy Option)~~ ~~9 credits:~~ ~~CATS 698 Applied Research Project with Report (6)~~ ~~CATS 699 Comprehensive Exam (3)~~	

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Research Paper: Creative Arts Therapies (Art Therapy Option)
Calendar Section Type: Defined group
Description of Change: Research Paper: Creative Arts Therapies (Art Therapy Option) Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Art Therapy Option) MA > Degree Requirements > Creative Arts Therapies (Art Therapy Option) MA

Type of Change: Defined Group Deletion

Present Text calendar	Proposed Text
~~9~~ **credits** ~~Research Paper: Creative Arts Therapies (Art Therapy Option)~~ ~~9 credits:~~ ~~CATS 689 Research Paper (9)~~	

Rationale:

Resource Implications:

D5

REGULATIONS CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Additional Degree Requirements
Calendar Section Type: Regulation
Description of Change: Additional Degree Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Type of change: Regulation Change

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Art Therapy Option) MA

Present Text calendar	Proposed Text
Additional Degree Requirements	Additional Degree Requirements
Residence. The minimum residence requirement is two years (5 terms) of full-time study, or the equivalent in part-time study.	**Residence.** The minimum residence requirement is two years (5 terms) of full-time study, or the equivalent in part-time study.
Practicum. In addition to the credit requirements, and as stipulated by the ~~professional program approval associations (the American Art Therapy Association and the~~ Canadian Art Therapy ~~Association),~~ each student must successfully complete a minimum of 800 hours (350 direct client contact hours and 450 agency hours) in the practice of art therapy, under faculty supervision, in an approved practicum setting. The program emphasizes experience with individual, group, and family formats for therapeutic interventions. Students work with different client populations during the first and second year of the practicum.	**Practicum.** In addition to the credit requirements, and as stipulated by the Canadian Art Therapy Association, each student must successfully complete a minimum of 800 hours (350 direct client contact hours and 450 agency hours) in the practice of art therapy, under faculty supervision, in an approved practicum setting. The program emphasizes experience with individual, group, and family formats for therapeutic interventions. Students work with different client populations during the first and second year of the practicum.

Rationale:
Approval by this association is no longer required because the Canadian Art Therapy Association now has a robust program approval process and set of standards. Concordia’s art therapy program relinquished the American Art Therapy Association Approval in 2020.

Resource Implications:
None

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Creative Arts Therapies (Drama Therapy Option) MA
Calendar Section Type: Program
Description of Change: Creative Arts Therapies (Drama Therapy Option) MA Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies
Program Name: Creative Arts Therapies (Drama Therapy Option) MA
Program Type: Course-based
Degree: MA

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Drama Therapy Option) MA > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
60 credits	Creative Arts Therapies (Drama Therapy Option) MA	**60 credits**	Creative Arts Therapies (Drama Therapy Option) MA
	~~45~~ credits of Core Courses		54 credits of Core Courses
	DTHY 600 Current Approaches to Drama Therapy (3)		DTHY 600 Current Approaches to Drama Therapy (3)
	DTHY 693 Research in Drama Therapy (3)		DTHY 693 Research in Drama Therapy (3)
	DTHY 603 Improvisation and Drama Therapy - Studio/Workshop (3)		DTHY 603 Improvisation and Drama Therapy - Studio/Workshop (3)
	DTHY 604 Drama Therapy and Groups (3)		DTHY 604 Drama Therapy and Groups (3)
	CATS 610 Introduction to Topics in Clinical Psychology for Creative Arts Therapists (3)		CATS 610 Introduction to Topics in Clinical Psychology for Creative Arts Therapists (3)
	CATS 611 Counselling Skills for Creative Arts Therapists (3)		CATS 611 Counselling Skills for Creative Arts Therapists (3)
	DTHY 613 Drama Therapy Practicum Supervision I (3)		DTHY 613 Drama Therapy Practicum Supervision I (3)
	DTHY 614 Drama Therapy Practicum Supervision II (3)		DTHY 614 Drama Therapy Practicum Supervision II (3)
	DTHY 623 Advanced Drama Therapy Practicum Supervision I (3)		DTHY 623 Advanced Drama Therapy Practicum Supervision I (3)
	DTHY 624 Advanced Drama Therapy Practicum Supervision II (3)		DTHY 624 Advanced Drama Therapy Practicum Supervision II (3)
	CATS 639 Interdisciplinary Topics: Cross-cultural Competence in the Creative Arts Therapies (1)		CATS 639 Interdisciplinary Topics: Cross-cultural Competence in the Creative Arts Therapies (1)
	CATS 641 Interdisciplinary Topics: Ethics in Clinical Practice in the Creative Arts Therapies (1)		CATS 641 Interdisciplinary Topics: Ethics in Clinical Practice in the Creative Arts Therapies (1)
	CATS 643 Interdisciplinary Topics: Ethics in Research in the Creative Arts Therapies (1)		CATS 643 Interdisciplinary Topics: Ethics in Research in the Creative Arts Therapies (1)
	DTHY 643 Sociodrama and Psychodrama (3)		DTHY 643 Sociodrama and Psychodrama (3)
	DTHY 644 Child and Adolescent Drama Therapy (3)		DTHY 644 Child and Adolescent Drama Therapy (3)
	DTHY 645 Assessment in Drama Therapy (3)		DTHY 645 Assessment in Drama Therapy (3)
	CATS 691 Research in the Creative Arts Therapies (3)		CATS 691 Research in the Creative Arts Therapies (3)

Present Text calendar	Proposed Text
6 Elective credits chosen in consultation with an academic faculty advisor. With the approval of the Chair of Creative Arts Therapies and that of the cooperating department, some or all of the elective credits may be chosen from other graduate programs in the Faculty of Fine Arts, other faculties at Concordia University, or other universities. ~~9 Additional credits chosen from one of two streams of research: Creative Arts Therapies (Drama Therapy Option) MA~~ ~~Research Paper Stream: Creative Arts Therapies (Drama Therapy Option) or Creative Arts Therapies (Drama Therapy Option) MA~~ ~~Applied Research Project Stream: Creative Arts Therapies (Drama Therapy Option)~~	CATS 689 Research Paper (9) 6 Elective credits chosen in consultation with an academic faculty advisor. With the approval of the Chair of Creative Arts Therapies and that of the cooperating department, some or all of the elective credits may be chosen from other graduate programs in the Faculty of Fine Arts, other faculties at Concordia University, or other universities.

Rationale:

The Department of Creative Arts Therapies has, pedagogically, moved away from formal examinations as modes of assessment and toward modes of assessment that offer students a diverse array of opportunities to demonstrate and consolidate their learning. In this instance, learning related to research is covered in CATS 691: Research in the Creative Arts Therapies and in DTHY 693: Research in Drama Therapy; and, that learning is mobilized in CATS 689: Research Paper.

Resource Implications:

None

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Research Paper Creative Arts Therapies (Drama Therapy Option)
Calendar Section Type: Defined group
Description of Change: Research Paper Creative Arts Therapies (Drama Therapy Option) Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Drama Therapy Option) MA > Degree Requirements > Creative Arts Therapies (Drama Therapy Option) MA

Type of Change: Defined Group Deletion

Present Text calendar	Proposed Text
~~9~~ **credits** ~~Research Paper Creative Arts Therapies (Drama Therapy Option)~~ ~~9 credits:~~ ~~CATS 689 Research Paper (9)~~	

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Applied Research Project: Creative Arts Therapies (Drama Therapy Option)
Calendar Section Type: Defined group
Description of Change: Applied Research Project: Creative Arts Therapies (Drama Therapy Option) Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Master/Magisteriate > Creative Arts Therapies (Drama Therapy Option) MA > Degree Requirements > Creative Arts Therapies (Drama Therapy Option) MA

Type of Change: Defined Group Deletion

Present Text calendar	Proposed Text
~~9~~ **credits** ~~Applied Research Project: Creative Arts Therapies (Drama Therapy Option)~~ ~~9 credits:~~ ~~CATS 698 Applied Research Project with Report (6)~~ ~~CATS 699 Comprehensive Exam (3)~~	

Rationale:
The Department of Creative Arts Therapies has, pedagogically, moved away from formal examinations as modes of assessment and toward modes of assessment that offer students a diverse array of opportunities to demonstrate and consolidate their learning. In this instance, learning related to research is covered in CATS 691: Research in the Creative Arts Therapies and in DTHY 693: Research in Drama Therapy; and, that learning is mobilized in CATS 689: Research Paper.

Resource Implications:
none

REGULATIONS CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: Admission Requirements
Calendar Section Type: Regulation
Description of Change: Admission Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Type of change: Regulation Change

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Fine Arts Programs > Creative Arts Therapies Programs > Graduate Diploma > Music Therapy Graduate Diploma

Present Text calendar	Proposed Text
Admission Requirements	Admission Requirements
- Bachelor’s degree with courses in Music (24 credits, which must include 6 credits in Musicology and 12 credits in Music Theory, or equivalents); Psychology (24 credits, which must include courses in Introductory, Developmental, and Abnormal Psychology, Theories of Personality, and Research Methodology, or equivalents); and Introduction to Music Therapy (3 credits), or equivalent. - Evidence of primary ~~instrument/voice~~ performance abilities at the level of completion of a ~~bachelor’s~~ degree in ~~Music; piano performance~~ abilities ~~at Grade 6 Royal Conservatory of Music level,~~ and ~~fundamental guitar~~ and voice ~~skills.~~ - Overall grade average of B- or better is expected. - Previous experience in a clinical, rehabilitative or educational setting. - Direct experience with the therapeutic process is highly desirable. - **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on requirements and exemptions.	- Bachelor’s degree with courses in Music (24 credits, which must include 6 credits in Musicology and 12 credits in Music Theory, or equivalents); Psychology (24 credits, which must include courses in Introductory, Developmental, and Abnormal Psychology, Theories of Personality, and Research Methodology, or equivalents); and Introduction to Music Therapy (3 credits), or equivalent. - Evidence of primary instrument (including voice) performance musicianship abilities at the level of completion of a bachelor's degree in music, or performing musicianship equivalent (various styles or genres). Applicants must also demonstrate strong functional musicianship abilities and creative potential on piano/keyboard, guitar, and voice (if these are not the applicant's primary instrument). - Overall grade average of B- or better is expected. - Previous experience in a clinical, rehabilitative or educational setting. - Direct experience with the therapeutic process is highly desirable. - **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on requirements and exemptions.

Rationale:

This change is intended to diversify our entrance audition requirements so that students from varying musical backgrounds can have their musicianship fairly assessed and recognized.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: ATRP 600
Calendar Section Type: Course
Description of Change: ATRP 600 Readings in Art Therapy Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Art Therapy Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ATRP 600 Readings in Art Therapy (3 credits)	ATRP 600 Readings in Art Therapy (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This course provides grounding in significant schools of psychological thought and their relevance to art therapy. It also promotes advanced knowledge and understanding of the therapeutic relationship and process from a psychodynamic perspective. ~~Studied psychotherapeutic models include: psychodynamic, object relations, humanistic, cognitive-behavioural, as well as theories of trauma.~~	This course provides grounding in significant schools of psychological thought and their relevance to art therapy. It also promotes advanced knowledge and understanding of the therapeutic relationship and process from a psychodynamic perspective.
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
The change in this description reflects an updated approach to teaching this course that is grounded in an increased and growing literature base in the field. Specific topics are being removed to ensure topic flexibility as the body of literature continues to grow and diversify.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: ATRP 613
Calendar Section Type: Course
Description of Change: ATRP 613 Art Therapy Practicum Supervision I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Art Therapy Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ATRP 613 Art Therapy Practicum Supervision I (3 credits)	ATRP 613 Art Therapy Practicum Supervision I (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
In this course, students acquire skills in the implementation of the principles of ~~psychotherapy within the practices of~~ art therapy ~~with~~ a selected ~~population.~~ Students learn observation and assessment procedures, treatment planning, skills in establishing and maintaining the therapeutic relationship, on-going evaluation, methods of clinical documentation, and professional reporting in multidisciplinary teams. Individual and group supervision are provided. A minimum of 150 practicum hours is required.	In this course, students acquire skills in the implementation of the principles of art therapy within a selected setting. Students learn observation and assessment procedures, treatment planning, skills in establishing and maintaining the therapeutic relationship, on-going evaluation, methods of clinical documentation, and professional reporting in multidisciplinary teams. Individual and group supervision are provided. A minimum of 150 practicum hours is required.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:
The change in description is to ensure that the pedagogical focus is on art therapy practice. The removal of psychotherapy ensures that the art therapy scope of practice is clearly articulated and respected in course descriptions. The change from population to settings to describe the practicum placement itself is intended to clarify that practicum placements are not always population-specific; practicum settings can often include work with a variety of individuals.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: ATRP 623
Calendar Section Type: Course
Description of Change: ATRP 623 Advanced Art Therapy Practicum Supervision I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Art Therapy Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ATRP 623 Advanced Art Therapy Practicum Supervision I (3 credits)	ATRP 623 Advanced Art Therapy Practicum Supervision I (3 credits)
Prerequisites:	*Prerequisites:*
The following courses must be completed previously: ATRP 613 and ATRP 614 .	The following courses must be completed previously: ATRP 613 and ATRP 614 .
Description :	*Description :*
This course is designed to promote the consolidation of students' abilities in the practice of art therapy, to further develop clinical skills, and deepen ~~psychotherapeutic~~ understanding. Individual and group supervision are provided. Case presentations, readings and clinical analysis of therapeutic issues are integral to this course. A minimum of 200 practicum hours is required.	This course is designed to promote the consolidation of students' abilities in the practice of art therapy, to further develop clinical skills, and deepen therapeutic understanding. Individual and group supervision are provided. Case presentations, readings and clinical analysis of therapeutic issues are integral to this course. A minimum of 200 practicum hours is required.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:
This change removes the word psychotherapeutic to ensure that the course description accurately reflects the art therapy scope of practice and the focus on the therapeutic process within that scope of practice.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 611
Calendar Section Type: Course
Description of Change: CATS 611 Counselling Skills for Creative Arts Therapists Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
CATS 611 Counselling Skills for Creative Arts Therapists (3 credits)	CATS 611 Counselling Skills for Creative Arts Therapists (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This course introduces basic ~~skills and~~ practices ~~of~~ counselling and psychotherapy for creative arts therapists. It provides the opportunity to explore, develop, and practice the skills required for effective therapeutic interventions across varied theoretical orientations and treatment approaches. The course focuses on the therapeutic relationship and the therapeutic frame.	This course introduces basic skills, practices and limits relevant to counselling and psychotherapy for creative arts therapists. It provides the opportunity to explore, develop, and practice the skills required for effective therapeutic interventions across varied theoretical orientations and treatment approaches. The course focuses on the therapeutic relationship and the therapeutic frame.
Component(s):	*Component(s):* Lecture ; Workshop
Notes :	*Notes :*

Rationale:
The changes to this description are intended to represent the necessary inclusion of an updated approach to teaching counselling skills for Creative Arts Therapists. Specifically, it addresses the ethical requirement to ensure students learn about the limits of these practices within the Creative Arts Therapies; and, it also addresses current requirements to include a diversity of approaches to practice within the Creative Arts Therapies.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 615
Calendar Section Type: Course
Description of Change: CATS 615 Independent Practicum in the Creative Arts Therapies Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CATS 615 Independent Practicum in the Creative Arts Therapies (3~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: ATRP 613 ; ATRP 614 . Permission of the Department is required.~~	
Description :	*Description :*
~~With the Department's approval and in agreement with a faculty supervisor, additional practicum experience is offered on an individual basis to students in special circumstances. A case study is required.~~	
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
This is being removed because it is not necessary to have a specific additional practicum course available. The option for an additional practicum experience, if warranted, would still be possible using independent study course codes.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 638
Calendar Section Type: Course
Description of Change: CATS 638 Creative Process in Clinical Practice for Creative Arts Therapists Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CATS 638 Creative Process in Clinical Practice for Creative Arts Therapists~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~This course provides experiential learning in the clinical application of creative projection techniques through a methodology based on exploring character in myth and fairy tale. The creative process is examined through readings, discussions, masks, movement, music and drama.~~	
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
This specialized elective course was developed by a faculty member who had specific expertise in this domain - experience that is no longer represented in the department. We maintain a course code, Special Topics in the Creative Arts Therapies (CATS 631) that still makes the development of specialized courses possible when such expertise is available.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 640
Calendar Section Type: Course
Description of Change: CATS 640 Studio Media and Practice for Creative Arts Therapists Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CATS 640 Studio Media and Practice for Creative Arts Therapists~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~Students develop skills with a variety of studio media and processes in their own creative arts discipline, while experiencing the media and creative process of an allied discipline. Commonalities and factors unique to each are examined for their potential in interdisciplinary practice.~~	
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
This specialized elective course was developed by a faculty member who had specific interests in this domain . We can no longer routinely ensure this course will be available, but we maintain a course code, Special Topics in the Creative Arts Therapies (CATS 631) that still makes the development of these kinds of specialized courses possible when specialized interests and expertise are available.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 645
Calendar Section Type: Course
Description of Change: CATS 645 Family Systems and the Creative Arts Therapies Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CATS 645 Family Systems and the Creative Arts Therapies~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~Family systems theory is introduced and specific theories and practices of family therapy are considered. Indications for the use of family therapy and its integration with the creative arts therapies are explored, as are specific methods of assessment and intervention.~~	
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
This specialized CATS course is being removed because the specific focus and associated competencies are being taught in modality specific courses that focus on group therapeutic processes and family systems. These courses include ATRP 604: Group and Family Art Therapy and DTHY 604: Group and Family in Drama Therapy.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 691
Calendar Section Type: Course
Description of Change: CATS 691 Research in the Creative Arts Therapies Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
CATS 691 Research in the Creative Arts Therapies (3 credits)	CATS 691 Research in the Creative Arts Therapies (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This course presents an overview of ~~qualitative research, theory~~ and ~~methodology,~~ and their ~~application to~~ the creative arts therapies. Students develop critical ~~reading~~ skills and explore ethical issues involved in ~~research.~~	This course presents an overview of qualitative, quantitative, and arts-based research theories and methodologies, and their realization within the creative arts therapies. Students develop critical research literacy skills and explore ethical issues involved in conducting research and mobilizing knowledge.
Component(s):	*Component(s):* Research
Notes :	*Notes :*

Rationale:
This course description has been updated to clarify that the course focuses on both research literacy in support of evidence-informed practice and on conducting research to support thesis-based students. It has also been updated to reflect current integration of arts-based methods and to reflect that teaching research theories and methodologies together provides a strong foundation for both research literacy and conduct.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 698
Calendar Section Type: Course
Description of Change: CATS 698 Applied Research Project with Report Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CATS 698 Applied Research Project with Report~~ (~~6~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~The student chooses this option to further explore specific pilot project reports, feasibility studies, creative research designs utilizing media intrinsic to the creative arts therapies, or to undertake research with artistic, photographic or video documentation relevant to the creative arts therapies. All applied projects must include a written component and be presented as a public seminar upon completion.~~	
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
This course is being deleted because students can pursue a variety of similar project options within CATS 689: Research Paper making this course offering redundant. It is also tied to the successful completion of the examination (CATS 699), and as a department, CATS has intentionally moved away from examination in favor of assessment or evaluation of learning that is more focused on providing diverse modes of evaluating student learning.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: CATS 699
Calendar Section Type: Course
Description of Change: CATS 699 Comprehensive Exam Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > CATS Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CATS 699 Comprehensive Exam~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~An oral/written comprehensive case study examination must be taken to demonstrate integrative aspects of learning and knowledge in the study of drama therapy or art therapy.~~	
Component(s):	*Component(s):*
~~Thesis Research~~	
Notes :	*Notes :*

Rationale:
The Department of Creative Arts Therapies has, pedagogically, moved away from formal examinations as modes of assessment and toward modes of assessment that offer students a diverse array of opportunities to demonstrate and consolidate their learning. In this instance, learning related to research is covered in CATS 691: Research in the Creative Arts Therapies, ATRP 693: Research in Art Therapy, DTHY 693: Research in Drama Therapy, and MTHY 693: Research in Music Therapy; and, that learning is mobilized in CATS 689: Research Paper and MTHY 699: Thesis.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: DTHY 600
Calendar Section Type: Course
Description of Change: DTHY 600 Current Approaches to Drama Therapy Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Drama Therapy Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
DTHY 600 Current Approaches to Drama Therapy (3 credits)	DTHY 600 Current Approaches to Drama Therapy (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This course provides grounding in significant ~~theoretical theories of~~ drama therapy ~~and correlating schools of psychological thought and their relevance to drama therapy.~~ It also promotes advanced knowledge and understanding of the therapeutic relationship and process from several drama ~~therapy, psychodynamic,~~ and psychotherapeutic perspectives. ~~Studied psychotherapeutic models include: psychodynamic, object relations, humanistic, cognitive-behavioural, as well as theories of trauma. Drama therapy models include: role theory, projective techniques, therapeutic theatre, the use of story, and performance techniques.~~	This course provides grounding in significant drama therapy theories. It also promotes advanced knowledge and understanding of the therapeutic relationship and process from several drama therapy and psychotherapeutic perspectives.
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
The change in this description reflects an updated approach to teaching this course that is grounded in an increased and growing literature base in the field. Specific topics are being removed to ensure topic flexibility as the body of literature continues to grow and diversify.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: DTHY 613
Calendar Section Type: Course
Description of Change: DTHY 613 Drama Therapy Practicum Supervision I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Drama Therapy Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
DTHY 613 Drama Therapy Practicum Supervision I (3 credits)	DTHY 613 Drama Therapy Practicum Supervision I (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
In this course, students acquire skills in the implementation of the principles ~~of psychotherapy within the~~ practices of drama therapy ~~with~~ a selected ~~population.~~ Students learn observation and assessment procedures, treatment planning, skills in establishing and maintaining the therapeutic relationship, on-going evaluation, methods of clinical documentation, and professional reporting in multidisciplinary teams. Individual and group supervision are provided. A minimum of 150 practicum hours is required.	In this course, students acquire skills in the implementation of the principles and practices of drama therapy within a selected setting. Students learn observation and assessment procedures, treatment planning, skills in establishing and maintaining the therapeutic relationship, on-going evaluation, methods of clinical documentation, and professional reporting in multidisciplinary teams. Individual and group supervision are provided. A minimum of 150 practicum hours is required.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:
The change in description is to ensure that the pedagogical focus is on drama therapy practice. The removal of psychotherapy ensures that the drama therapy scope of practice is clearly articulated and respected in course descriptions. The change from population to settings to describe the practicum placement itself is intended to clarify that practicum placements are not always population-specific; practicum settings can often include work with a variety of individuals

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: DTHY 623
Calendar Section Type: Course
Description of Change: DTHY 623 Advanced Drama Therapy Practicum Supervision I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Drama Therapy Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
DTHY 623 Advanced Drama Therapy Practicum Supervision I (3 credits)	DTHY 623 Advanced Drama Therapy Practicum Supervision I (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This course is designed to promote the consolidation of students' abilities in the practice of drama therapy, to further develop clinical skills, and deepen ~~psychotherapeutic~~ understanding. Individual and group supervision are provided. Case presentations, readings and clinical analysis of therapeutic issues are integral to this course. A minimum of 200 practicum hours is required.	This course is designed to promote the consolidation of students' abilities in the practice of drama therapy, to further develop clinical skills, and deepen therapeutic understanding. Individual and group supervision are provided. Case presentations, readings and clinical analysis of therapeutic issues are integral to this course. A minimum of 200 practicum hours is required.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:
This change removes the word psychotherapeutic to ensure that the course description accurately reflects the drama therapy scope of practice and the focus on the therapeutic process within that scope of practice.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 501
Calendar Section Type: Course
Description of Change: MTHY 501 Music Therapy Skills Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy Graduate Diploma Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MTHY 501 Music Therapy Skills (3 credits)	MTHY 501 Music Therapy Skills (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This course introduces students to basic materials, methods, and ~~skills~~ used to engage people in music ~~therapy. These~~ include ~~improvisation, performance, leadership,~~ group ~~management,~~ and appropriate repertoire/materials ~~development~~ for ~~various~~ ages ~~and populations. Participation~~ in ~~varied experiences include, but are not limited to, vocal and instrumental improvisation, drumming circles, movement, melodic instruments, assistive technology, integrated arts, and songwriting.~~	This course introduces students to basic materials, methods, and techniques used to engage people in music therapy processes. Students engage in and learn how to design a range of music therapy experiences that include receptive (e.g., music listening, moving/drawing to music); re-creation (e.g., singing or playing pre-composed music); improvisation (e.g., spontaneous creation of music using voice, various instruments); and composition (e.g., songwriting, beat making). Students also develop individual and group leadership and facilitation skills and learn to compile appropriate repertoire/materials for working with people of all ages in various settings.
Component(s):	*Component(s):* Lecture ; Workshop
Notes :	*Notes :*

Rationale:
This small change in wording is intended to reflect current music therapy pedagogy and the focus on competencies and techniques as opposed to skills - this change aligns with current practices in music therapy education and with how competencies are described by external certification bodies.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 510
Calendar Section Type: Course
Description of Change: MTHY 510 Music Therapy Practicum I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy Graduate Diploma Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MTHY 510 Music Therapy Practicum I (3 credits)	MTHY 510 Music Therapy Practicum I (3 credits)
Prerequisites:	*Prerequisites:*
~~The following course must be completed concurrently: MTHY 503 .~~	
Description :	*Description :*
This practicum course ~~with adults~~ is ~~one~~ in a series of practica that cumulatively ~~fulfills the requirements of~~ the ~~200-hour~~ preclinical and ~~the 1,000-hour~~ supervised clinical internship ~~requirements, as stipulated by~~ the ~~professional program approval associations (the~~ Canadian Association ~~for Music Therapy and the American~~ Music ~~Therapy Association).~~ Students ~~develop as professional music therapists within a social, political~~ and ~~cultural context. Students acquire skills in the implementation of the principles and practices of~~ music therapy within ~~adult populations, including observation and assessment procedures, treatment planning, evaluation, and reporting~~ in ~~multi-disciplinary team settings. Students have the opportunity to explore, develop, and integrate academic and practical knowledge and skills within a clinical setting.~~ A minimum of 300 practicum hours is required.	This practicum course is the first in a series of practica that cumulatively fulfill the (200-hour) preclinical and (1,000-hour) supervised clinical internship requirements of the Canadian Association of Music Therapists. Students learn to plan, facilitate and evaluate individual and/or group music therapy sessions with a diverse array of people within specific community, education, and/or healthcare contexts in person and/or online. A minimum of 300 practicum hours is required. Individual, dyad, and group supervision are provided.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:

This change responds to necessary changes in practicum placements that are no longer guaranteed to be population-specific. Students, during this course, may work with a variety of individuals. It also removes the American Music Therapy Association as an approval body because our program is no longer required to be recognized by that body for our graduates to be eligible to write the US-based Certification Board for Music Therapists exam. We maintain recognition by the Canadian Association of Music Therapists.

The requirement to take MTHY 503 concurrently is being removed. Currently students are placed in population-specific practica which meant that they took the population-specific course at the same time. This is no longer the case and as the development of music therapy competencies

can by implemented and adapted for clients of all ages, the concurrency requirement is no longer necessary.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 511
Calendar Section Type: Course
Description of Change: MTHY 511 Music Therapy Practicum II Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy Graduate Diploma Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MTHY 511 Music Therapy Practicum II (3 credits)	MTHY 511 Music Therapy Practicum II (3 credits)
Prerequisites:	*Prerequisites:*
~~The following course must be completed concurrently: MTHY 504 .~~	
Description :	*Description :*
This practicum course ~~within children and adolescent populations~~ is ~~one~~ in a series of practica that cumulatively ~~fulfills the requirements of~~ the ~~200-hour pre-clinical~~ and ~~the 1,000-hour~~ supervised clinical internship ~~requirements, as stipulated by~~ the ~~professional program approval associations (the~~ Canadian Association ~~for~~ Music ~~Therapy~~ and ~~the American Music Therapy Association). Students develop as professional~~ music ~~therapists within~~ a ~~social, political and cultural context. Students acquire skills in the implementation~~ of ~~the principles and practices of music therapy~~ within ~~child and adolescent populations, including observation and assessment procedures, treatment planning, evaluation, and reporting~~ in ~~multi-disciplinary team settings. Students have the opportunity to explore, develop, and integrate academic and practical knowledge and skills within a clinical setting.~~ A minimum of 300 practicum hours is required.	This practicum course is the second in a series of practica that cumulatively fulfill the (200-hour) preclinical and (1,000-hour) supervised clinical internship requirements of the Canadian Association of Music Therapists. Students continue to learn to plan, facilitate and evaluate individual and/or group music therapy sessions with a diverse array of people within specific community, education, and/or healthcare contexts in person and/or online. A minimum of 300 practicum hours is required. Individual, dyad, and group supervision are provided.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:

This change removes children and adolescent populations to reflect a necessary change in practicum placements that are not always population-specific. Practicum settings often have students working with a variety of individuals. It also removes the American Music Therapy Association as one of the organizations by which our program is recognized - a recognition that is no longer necessary for our graduates to be eligible to write the US-based Certification Board for Music Therapists exam. This description also adds text that documents that students will receive group, dyad, and individual supervision which is a requirement of our external accrediting body, the Canadian Association of Music Therapists.

The requirement to take MTHY 504 concurrently is being removed. Currently students are placed in population-specific practica which meant that they took the population-specific course at the same time. This is no longer the case and as the development of music therapy competencies can by implemented and adapted for clients of all ages, the concurrency requirement is no longer necessary.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 512
Calendar Section Type: Course
Description of Change: MTHY 512 Music Therapy Practicum III Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy Graduate Diploma Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MTHY 512 Music Therapy Practicum III (9 credits)	MTHY 512 Music Therapy Practicum III (9 credits)
Prerequisites:	*Prerequisites:*
The following courses must be completed previously: MTHY 510 and MTHY 511 .	The following courses must be completed previously: MTHY 510 and MTHY 511 .
Description :	*Description :*
This practicum course ~~with~~ diverse ~~populations~~ is the final in a series of practica that cumulatively ~~fulfills the requirements of~~ the ~~200-hour~~ preclinical and ~~the 1,000-hour~~ supervised clinical internship requirements, as stipulated by the professional program approval ~~associations~~ (the Canadian Association ~~for Music Therapy and the American~~ Music ~~Therapy Association). Students develop as professional music therapists within a social, political and cultural context.~~ With a greater focus on clinical work in this practicum, students have the opportunity to ~~specialize in~~ a ~~clinical population~~ of their choice, preparing for future careers and/or graduate studies in music therapy. A minimum of 600 practicum hours is required. Students are also required to attend classes which may be offered as weekend intensives.	This practicum course within diverse settings is the final in a series of practica that cumulatively fulfill the (200-hour) preclinical and (1,000-hour) supervised clinical internship requirements, as stipulated by the professional program approval association (the Canadian Association of Music Therapists). With a greater focus on clinical work in this practicum, students may have the opportunity to concentrate on a practice context of their choice, preparing for future careers and/or graduate studies in music therapy. A minimum of 600 practicum hours is required. Individual, dyad, and group supervision are provided. Students are also required to attend classes which may be offered as weekend intensives.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*

Rationale:
These changes reflect the necessary shift from population-based placements to settings that often support a diverse array of individuals. It also removes the American Music Therapy Association from the description as one of the professional approval bodies because their approval is no longer required for our graduates to be eligible to write the US-based Certification Board for Music Therapists exam. This final practicum placement cannot guarantee the opportunity for students to specialize with a particular group of individuals, so the word “may” has been added to reflect this reality.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 602
Calendar Section Type: Course
Description of Change: MTHY 602 Advanced Clinical Improvisation in Music Therapy I Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy MA Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MTHY 602 Advanced Clinical Improvisation in Music Therapy I (1.5 credits)	MTHY 602 Advanced Clinical Improvisation in Music Therapy I (1.5 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
This ~~course explores the applications of clinical improvisation processes~~ in therapy and ~~assessment. The specific focus is determined by identified student~~ strengths and ~~needs,~~ and ~~may include Nordoff and Robbins techniques; advanced piano techniques; analytical~~ music ~~therapy;~~ and ~~others.~~	This advanced experiential seminar/workshop focuses on developing competencies in various musical styles, traditions, and mediums (e.g., piano, guitar, voice, other instruments) conceptualized within assorted music therapy improvisational methods/approaches. Students identify and develop personal musical strengths and resources through individual and group music practice, interactive online lectures and labs, and reflexive music-based assignments. Practical applications of acquired musical competencies are realized within students' practicum
Component(s):	*Component(s):*
Online	Online
Notes :	*Notes :*

Rationale:
This change more accurately reflects the experiential nature of this course and more accurately describes the curriculum aligned with current approaches to music therapy clinical improvisation.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 603
Calendar Section Type: Course
Description of Change: MTHY 603 Advanced Clinical Improvisation in Music Therapy II Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy MA Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MTHY 603 Advanced Clinical Improvisation in Music Therapy II (1.5 credits)	MTHY 603 Advanced Clinical Improvisation in Music Therapy II (1.5 credits)
Prerequisites:	*Prerequisites:*
The following course must be completed previously: MTHY 602 , or equivalent.	The following course must be completed previously: MTHY 602 , or equivalent.
Description :	*Description :*
~~Advanced study~~ in ~~clinical improvisation techniques in~~ music ~~therapy. The specific focus is determined by the identified student experience, strengths,~~ and ~~needs,~~ and ~~may include Nordoff and Robbins techniques; advanced piano~~ and ~~vocal techniques; analytical~~ music ~~therapy;~~ and ~~others.~~	This advanced experiential seminar/workshop is a continuation of MTHY 602. It focuses on further developing and refining competencies in new and varied musical styles, traditions, and mediums (e.g., piano, guitar, voice, other instruments) conceptualized within assorted music therapy improvisational methods/approaches. Students identify and develop personal musical strengths and resources through individual and group music practice, interactive online lectures and labs, and reflexive music-based assignments. Practical applications of acquired musical competencies are realized within students' practicum settings.
Component(s):	*Component(s):*
Online	Online
Notes :	*Notes :*

Rationale:
This change more accurately reflects the experiential nature of this course and more accurately describes the curriculum aligned with current approaches to music therapy clinical improvisation.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CATS Minor Curriculum Revisions

Calendar Section Name: MTHY 625
Calendar Section Type: Course
Description of Change: MTHY 625 Guided Imagery and Music, Level I Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Creative Arts Therapies

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 03 Aug 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Fine Arts Courses > Creative Arts Therapies Courses > Music Therapy Courses > Music Therapy MA Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~MTHY 625 Guided Imagery and Music, Level I~~ (~~3~~ credits)	
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~This course introduces students to the Guided Imagery and Music method (GIM) through demonstrations, theoretical discussion and personal experiences. Specific topics covered include: the role of music in GIM, relaxation techniques, types of imagery and basic guiding techniques, and the implementation of GIM in assessment. This course is graded on a Pass/Fail basis.~~	
Component(s):	*Component(s):*
Notes :	*Notes :*

Rationale:
This course is being removed because all Guided Imagery and Music courses in Canada are now offered through private institutes, and it is not possible for our department to offer the course internally due to low enrollment.

Resource Implications:
None.

Impact Report

Programs

Creative Arts Therapies (Art Therapy Option) MA
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Creative Arts Therapies Programs -> Master/Magisteriate -> Creative Arts Therapies (Art Therapy Option) MA -> Degree Requirements
Source of Impact

- ATRP 600
- ATRP 613
- ATRP 623
- Applied Research Project: Creative Arts Therapies (Art Therapy Option)
- CATS 611
- CATS 691
- Research Paper: Creative Arts Therapies (Art Therapy Option)

Creative Arts Therapies (Drama Therapy Option) MA
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Creative Arts Therapies Programs -> Master/Magisteriate -> Creative Arts Therapies (Drama Therapy Option) MA -> Degree Requirements
Source of Impact

- Applied Research Project: Creative Arts Therapies (Drama Therapy Option)
- CATS 611
- CATS 691
- Creative Arts Therapies (Drama Therapy Option) MA
- DTHY 600
- DTHY 613
- DTHY 623
- Research Paper Creative Arts Therapies (Drama Therapy Option)

Creative Arts Therapies (Music Therapy) MA
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Creative Arts Therapies Programs -> Master/Magisteriate -> Creative Arts Therapies (Music Therapy) MA -> Degree Requirements
Source of Impact

- CATS 691
- MTHY 602
- MTHY 603

Music Therapy Graduate Diploma
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Creative Arts Therapies Programs -> Graduate Diploma -> Music Therapy Graduate Diploma -> Degree Requirements
Source of Impact

- CATS 611
- MTHY 501
- MTHY 510
- MTHY 511
- MTHY 512

Defined Groups

Applied Research Project: Creative Arts Therapies (Art Therapy Option)
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Creative Arts Therapies Programs -> Master/Magisteriate -> Creative Arts Therapies (Art Therapy Option) MA -> Degree Requirements ->

Creative Arts Therapies (Art Therapy Option) MA
Source of Impact

- CATS 698
- CATS 699

Applied Research Project: Creative Arts Therapies (Drama Therapy Option)
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Fine Arts Programs -> Creative Arts Therapies Programs -> Master/Magisteriate -> Creative Arts Therapies (Drama Therapy Option) MA -> Degree Requirements -> Creative Arts Therapies (Drama Therapy Option) MA
Source of Impact

- CATS 698
- CATS 699

Courses

ATRP 614
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Art Therapy Courses
Source of Impact

- ATRP 613

ATRP 623
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Art Therapy Courses
Source of Impact

- ATRP 613

ATRP 624
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Art Therapy Courses
Source of Impact

- ATRP 613
- ATRP 623

ATRP 693
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Art Therapy Courses
Source of Impact

- CATS 691

CATS 615
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> CATS Courses
Source of Impact

- ATRP 613

CATS 689
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> CATS Courses
Source of Impact

- CATS 691

DTHY 614
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Drama Therapy Courses
Source of Impact

- DTHY 613

MTHY 512
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Music Therapy Courses -> Music Therapy Graduate Diploma Courses
Source of Impact

- MTHY 510
- MTHY 511

MTHY 603
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Music Therapy Courses -> Music Therapy MA Courses
Source of Impact

- MTHY 602

MTHY 699
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Fine Arts Courses -> Creative Arts Therapies Courses -> Music Therapy Courses -> Music Therapy MA Courses
Source of Impact

- CATS 691

Graduate Program Regular Curriculum Change - GCS-CES-5941 - VERSION : 9

Summary and Rationale for Changes

CES is proposing four changes to the Graduate Certificate in Innovation, Technology and Society

1. We are proposing to establish ENCS 6045 Entrepreneurship and Innovation as a permanent one-credit course. This course has been successfully offered for more than three years as ENCS 692 Technology Innovation and Entrepreneurship as a slot course and has demonstrated consistent student interest and academic value. This course is listed in Topic Area E09 which is shared by another dossier that is in process.

2. We are proposing to replace ENCS 6043 Seminar in Innovation Process (1 credit) with ENCS 6045 Entrepreneurship and Innovation (1 credit) in the theory core courses for the Graduate Certificate in Innovation, Technology and Society. This modification will strengthen the certificate's focus on entrepreneurship, an area currently under-represented in the certificate curriculum. ENCS 6045 provides structured training in entrepreneurial thinking, opportunity recognition, and sustainable business development—key competencies for engineers and professionals engaging with innovation in societal contexts.

3. We are changing the prerequisite for ENCS 6044. We are removing ENCS 6043 as a prerequisite for ENCS 6044.

4. We are permanently deleting ENCS 6043 Seminar in Innovation Process from the graduate calendar.

Resource Implications

None.

Graduate Program Regular Curriculum Change - GCS-CES-5941 - VERSION : 9

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 3 D3). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Program & Development / School of Graduate Studies,
The Graduate Curriculum Committee (GCC), 16 Feb 2026

Approved by:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 30 Jan 2026

At its meeting on January 30, 2026, the Council of the Gina Cody School of Engineering and Computer Science approved, as presented, the curriculum item from the Centre for Engineering in Society (CES). Namely, changes to the Graduate Certificate in Innovation, Technology and Society and the introduction of a new permanent course ENCS 6045 Entrepreneurship and Innovation, previously offered as a slot course.

There are no additional resources required.

Details of the curriculum changes are indicated and explained in the dossier GCS-CES-5941.

We kindly request that this proposal be placed on the next agenda of the GCC for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 05 Dec 2025

Approved by:

B. Vermeire, Associate Dean,
Graduate Studies Committee of the Gina Cody School of Engineering and Computer Science, 14 Nov 2025

At its meeting on December 12, 2025, the Graduate Studies Committee of the Gina Cody School of Engineering and Computer Science reviewed and approved, with minor modifications, the proposal from the Centre for Engineering in Society (CES). Namely, changes to the Graduate Certificate in Innovation, Technology and Society and introduction of a new permanent course **ENCS 6045 Entrepreneurship and Innovation**, previously offered as a slot course.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-CES-5941dossier.

We kindly request that this proposal be placed on the next agenda of the Council of the Gina Cody School of Engineering and Computer Science for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: Department approval

For Submission to:

Brian Vermeire, Associate Dean, Graduate Programs,
Graduate Studies Committee, 10 Dec 2025

Approved by:

Govind Gopakumar, Department Chair,
CES Department Council, 27 Oct 2025

Dear Dr. Vermeire,

CES is seeking to make changes to the Graduate Certificate in Innovation, Technology, and Society. These changes include deleting ENCS 6043 from the program and replacing it with a new course ENCS 6045. The change will allow the program to develop a stronger focus on entrepreneurship.

CES Department council approved the changes unanimously.

Thank you

Govind Gopakumar

Chair of CES

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ENCS 6043 Seminar in Innovation Process Delete	✗	✗	✗	✗	✗		✗	✗	✗	
ENCS 6044 Practicum in Innovation Process Change				✎	✎					
ENCS 6045 Entrepreneurship and Innovation New	★	★	★	★		★	★	★	★	

Program Changes:

	Suspend Admissions	Program Degree Type Change	Program Title Change	Program Require-ments Change	Change to Program Type	Change to Total Credit Value of Program	Change to Primary Campus
Innovation, Technology and Society Graduate Certification Change				✎			

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
E09 - Professional Leadership Skills Change		✎	

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Change to Graduate Certificate

Calendar Section Name: Innovation, Technology and Society Graduate Certification
Calendar Section Type: Program
Description of Change: Innovation, Technology and Society Graduate Certification Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Centre for Engineering in Society
Program Name: Innovation, Technology and Society Graduate Certification
Program Type: Course-based
Degree: Graduate Certificate

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Centre for Engineering in Society Programs > Graduate Certificate > Innovation, Technology and Society Graduate Certificate > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
15 credits	Innovation, Technology and Society Graduate Certification	**15 credits**	Innovation, Technology and Society Graduate Certification
	9 ~~credits~~ chosen from ~~the~~ Theory ~~Core Courses~~ ENCS 6041 Creativity, Innovation, and Critical Thinking (4) ENCS 6042 Communication Techniques for the Innovation Process (4) ENCS ~~6043 Seminar in~~ Innovation ~~Process~~ (1) 6 credits chosen from the Practicum ENCS 6044 Practicum in Innovation Process (6) The graduate certificate can be completed within an academic year.		9 Credits chosen from Theory core courses ENCS 6041 Creativity, Innovation, and Critical Thinking (4) ENCS 6042 Communication Techniques for the Innovation Process (4) ENCS 6045 Entrepreneurship and Innovation (1) 6 credits chosen from the Practicum ENCS 6044 Practicum in Innovation Process (6) The graduate certificate can be completed within an academic year.

Rationale:

Following curriculum review discussions, we would like to propose replacing ENCS 6043 – Seminar in Innovation Process with ENCS 6045 – Entrepreneurship and Innovation in the theory core courses of the Graduate Certificate in Innovation, Technology and Society.

This modification will strengthen the certificate's focus on business innovation and social sustainability, areas currently under-represented in the curriculum. ENCS 6045 provides structured training in entrepreneurial thinking, opportunity recognition, and sustainable business development—key competencies for engineers and professionals engaging with innovation in societal contexts. The course explicitly bridges technological advancement with

social and environmental sustainability through business innovation and entrepreneurial practice, aligning closely with the program’s mission to explore how innovation shapes and serves society through business.

Resource Implications:

None

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Change to Graduate Certificate

Calendar Section Name: E09 - Professional Leadership Skills
Calendar Section Type: Defined group
Description of Change: E09 - Professional Leadership Skills Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Centre for Engineering in Society

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > List of Engineering Courses by Topic Areas

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
E09 - Professional Leadership Skills	**credits**	E09 - Professional Leadership Skills
ENCS 6031 Cultures of Engineering Practice (4) ENCS 6041 Creativity, Innovation, and Critical Thinking (4) ENCS 6042 Communication Techniques for the Innovation Process (4) ENCS 6201 Ethics and Professionalism (1) ENCS 6821 Development and Global Engineering (4) ENCS 692 Topics in Engineering and Computer Science (1) Note: Students may take ENCS 692 more than one time for credit, provided the subject matter is different each time. Note: The following course is cross-listed: ENCS 6821 is cross-listed with ENCS 484.		ENCS 6031 Cultures of Engineering Practice (4) ENCS 6041 Creativity, Innovation, and Critical Thinking (4) ENCS 6042 Communication Techniques for the Innovation Process (4) ENCS 6045 Entrepreneurship and Innovation (1) ENCS 6201 Ethics and Professionalism (1) ENCS 6821 Development and Global Engineering (4) ENCS 6823 Artificial Intelligence (AI) and Society (4) ENCS 692 Topics in Engineering and Computer Science (1) Note: Students may take ENCS 692 more than one time for credit, provided the subject matter is different each time. Note: The following course is cross-listed: ENCS 6821 is cross-listed with ENCS 484.

Rationale:
Included changes in E09 are ENCS 6045 in this dossier and ENCS 6823 in dossier GCS-CES-5953.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Change to Graduate Certificate

Calendar Section Name: ENCS 6043
Calendar Section Type: Course
Description of Change: ENCS 6043 Seminar in Innovation Process
Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Centre for Engineering in Society

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Engineering and Computer Science Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~ENCS 6043 Seminar in Innovation Process~~ (~~1~~ credits)	
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously or concurrently: ENCS 6041 and ENCS 6042 .~~	
Description :	*Description :*
~~Registration is restricted to students enrolled in the Graduate Certificate in Innovation, Technology and Society. The seminar integrates theoretical concepts in innovation and communication processes in preparation for projects in the certificate practicum.~~	
Component(s):	*Component(s):*
~~Seminar ; Reading~~	
Notes :	*Notes :*

Rationale:
ENCS 6043 is being deleted since this course will be replaced by ENCS 6045 in the certificate. This course has not been offered for a few years and no other programs rely on this course. Therefore, we do not expect any impact from deleting this course.

Resource Implications:
None

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Change to Graduate Certificate

Calendar Section Name: ENCS 6044
Calendar Section Type: Course
Description of Change: ENCS 6044 Practicum in Innovation Process Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Centre for Engineering in Society

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Engineering and Computer Science Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ENCS 6044 Practicum in Innovation Process (6 credits)	ENCS 6044 Practicum in Innovation Process (6 credits)
Prerequisites:	*Prerequisites:*
The following courses must be completed previously: ENCS 6041 , ~~ENCS 6042~~ and ENCS ~~6043~~ . Registration is restricted to students enrolled in the Graduate Certificate in Innovation, Technology and Society.	The following courses must be completed previously: ENCS 6041 , and ENCS 6042 . Registration is restricted to students enrolled in the Graduate Certificate in Innovation, Technology and Society. The following course must be taken concurrently: ENCS 6045 .
Description :	*Description :*
The practicum takes place in the Concordia District 3 Centre for Innovation and Entrepreneurship. Students develop innovation projects under the supervision of ~~academic advisors~~ and District 3 instructional personnel.	The practicum takes place in the Concordia District 3 Centre for Innovation and Entrepreneurship. Students develop innovation projects under the supervision of an instructor and District 3 instructional personnel.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*
Non-standard assessment note : This course is graded on a pass/fail basis.	**Non-standard assessment note :** This course is graded on a pass/fail basis.

Rationale:
Changing the prerequisite for ENCS 6044 to adjust for the removal of ENCS 6043.

Resource Implications:
None

D5

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Change to Graduate Certificate

Calendar Section Name: ENCS 6045
Calendar Section Type: Course
Description of Change: ENCS 6045 Entrepreneurship and Innovation
New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Centre for Engineering in Society

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Engineering and Computer Science Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ENCS 6045 Entrepreneurship and Innovation (1 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* This course examines how technological innovations drive new business creation and societal change. It introduces the processes of opportunity recognition, innovation management, and commercialization, emphasizing how ideas move from the laboratory to the marketplace. Students explore entrepreneurial strategy, market research, financial planning, and legal considerations in developing sustainable and socially responsible businesses. Through lectures, exercises, and case analyses, students learn to evaluate business opportunities, design business models, and prepare business plans that integrate creativity, innovation, and sustainability.
Component(s):	*Component(s):* Online
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for Entrepreneurship and Innovation under ENCS 692 may not take this course for credit.

Rationale:

Following curriculum review discussions, We propose that ENCS 6045 Entrepreneurship and Innovation be established as a permanent one-credit course. This course has been successfully offered for more than three years as ENCS 692 Technology Innovation and Entrepreneurship slot course and has demonstrated consistent student interest (with annual enrolment of 54 in 2025, 75 in 2024, 192 in 2023 and 51 in 2022) and academic value. Formalizing it as a permanent course will provide continuity and administrative stability to an established offering that has become integral to graduate education in the Gina Cody School.

Furthermore, ENCS 6045 will serve as a key component of the Graduate Certificate in Innovation, Technology and Society, helping the program deliver on its mandate to link engineering, innovation, and societal transformation. The course complements existing modules by

offering students foundational exposure to entrepreneurship, innovation management, and sustainable business creation.

This course is listed in Topic Area E09 which is in use by another dossier pending of approval.

Resource Implications:
The course will count for faculty member's workload

Impact Report

Programs

Building Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Building, Civil and Environmental Engineering Programs -> Master/Magisteriate -> Building Engineering MEng -> Degree Requirements
Source of Impact

- E09 - Professional Leadership Skills

Civil Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Building, Civil and Environmental Engineering Programs -> Master/Magisteriate -> Civil Engineering MEng -> Degree Requirements
Source of Impact

- E09 - Professional Leadership Skills

Construction Engineering and Management MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Building, Civil and Environmental Engineering Programs -> Master/Magisteriate -> Construction Engineering and Management MEng -> Degree Requirements
Source of Impact

- E09 - Professional Leadership Skills

Environmental Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Building, Civil and Environmental Engineering Programs -> Master/Magisteriate -> Environmental Engineering MEng -> Degree Requirements
Source of Impact

- E09 - Professional Leadership Skills

Innovation, Technology and Society Graduate Certification
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Centre for Engineering in Society Programs -> Graduate Certificate -> Innovation, Technology and Society Graduate Certificate -> Degree Requirements
Source of Impact

- ENCS 6043
- ENCS 6044

Mechanical Engineering Graduate Certificate
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Graduate Certificate -> Mechanical Engineering Graduate Certificate -> Degree Requirements
Source of Impact

- E09 - Professional Leadership Skills

Mechanical Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer

Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Mechanical Engineering MEng -> Degree Requirements
Source of Impact

- E09 - Professional Leadership Skills

Defined Groups

Applied Computer Science MAPCompSc Electives
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Computer Science and Software Engineering Programs -> Master/Magisteriate -> Applied Computer Science MApCompSc -> Degree Requirements -> Applied Computer Science MApCompSc
Source of Impact

- E09 - Professional Leadership Skills

Chemical Engineering Graduate Diploma Electives
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Chemical and Materials Engineering Programs -> Graduate Diploma -> Chemical Engineering Graduate Diploma -> Degree Requirements -> Chemical Engineering Graduate Diploma
Source of Impact

- E09 - Professional Leadership Skills

Chemical Engineering MASc Electives List
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Chemical and Materials Engineering Programs -> Master/Magisteriate -> Chemical Engineering MASc -> Degree Requirements -> Chemical Engineering MASc
Source of Impact

- E09 - Professional Leadership Skills

Chemical Engineering PhD Courses
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Chemical and Materials Engineering Programs -> Doctor/Doctorate -> Chemical Engineering PhD -> Degree Requirements -> Chemical Engineering PhD
Source of Impact

- E09 - Professional Leadership Skills

Option II: Lean Systems Engineering
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Industrial Engineering MEng -> Degree Requirements -> Industrial Engineering MEng
Source of Impact

- E09 - Professional Leadership Skills

Option III. Supply Chain Engineering
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Industrial Engineering MEng -> Degree Requirements -> Industrial Engineering MEng
Source of Impact

- E09 - Professional Leadership Skills

Option IV. Industrial Optimization and Systems Analytics
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer

Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Industrial Engineering MEng -> Degree Requirements -> Industrial Engineering MEng
Source of Impact

- E09 - Professional Leadership Skills

Option V. Reliability and Maintenance Engineering
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Industrial Engineering MEng -> Degree Requirements -> Industrial Engineering MEng
Source of Impact

- E09 - Professional Leadership Skills

Option VI. Industrial Engineering General Stream
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Industrial Engineering MEng -> Degree Requirements -> Industrial Engineering MEng
Source of Impact

- E09 - Professional Leadership Skills

Software Engineering MEng Electives
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Computer Science and Software Engineering Programs -> Master/Magisteriate -> Software Engineering MEng -> Degree Requirements -> Software Engineering MEng
Source of Impact

- E09 - Professional Leadership Skills

Courses

ENCS 6044
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> Engineering and Computer Science Courses
Source of Impact

- ENCS 6043

ENCS 6045 Entrepreneurship and Innovation New
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> Engineering and Computer Science Courses
Source of Impact

Other Units

Addition of **ENCS 6045** to **Innovation, Technology and Society Graduate Certification** requirement
Source of other unit Impact

- Course is housed in Engineering Courses

ENCS 6045 Entrepreneurship and Innovation

Winter 2027

Course Information

Instructor Name: Dr. Yuxi Zhao

Email: yuxi.zhao@concordia.ca

Office Hours: By appointment

Course Description

Technological innovation takes the results of research in science and engineering and uses them to create new businesses and transform our world. This course is designed to help students understand the process of commercialization of research and how technological and social innovations lead to new businesses and how they are created, funded, governed, and grown. Students acquire the knowledge and skills needed to manage the development of innovations, recognize and evaluate potential opportunities to monetize these innovations, plan specific and detailed methods to exploit these opportunities, and acquire the resources necessary to implement these plans. This course also helps students understand the complex relationship between technology entrepreneurship, sustainability, and the society. Topics include entrepreneurial thinking, innovation management, opportunity spotting and evaluation, industry and market research, entrepreneurial strategy and sales, accounting, entrepreneurial financing, fundraising, business plans, elevator pitch, legal considerations, co-ops, sustainability, business ethics, and technological entrepreneurship's social impacts.

Educational Objectives

Upon completing this course, students will be able to:

1. Identify how technological innovations drive new business creation and broader economic and social transformation.
2. Understand entrepreneurial thinking and innovation management principles to identify, evaluate, and develop viable market opportunities.
3. Apply strategic, financial, and organizational plans to launch and grow entrepreneurial ventures from concept to commercialization.

Texts/Materials

Course Materials (download from Moodle): PowerPoint slides and other documents

Student Evaluation

The total points (100 points) will be composed of the following:

- Class Exercises: 30 points
- Midterm Exam: 20 points
- Final Exam: 50 points

Course Schedule

Week	Topics
Week 1	Course introduction: what is entrepreneurship
Week 2	Innovation management
Week 3	Defining your business ideas and opportunities
Week 4	Market feasibility
Week 5	Cost and profitability 1
Week 6	Cost and profitability 2
Week 7	NO CLASS – Reading Week
Week 8	Entrepreneurial marketing and sales 1
Week 9	Entrepreneurial marketing and sales 2
Week 10	Intellectual property and legal considerations
Week 11	Social entrepreneurship
Week 12	Accounting for entrepreneurs
Week 13	Financing your business

(Note: This schedule is subject to change.)

Internal Memorandum
Centre for Engineering in Society

To: Dr. Govind Gopakumar, Chair, CES
From: Dr. Yuxi Zhao, CES
Date: October 20, 2025
Subject: Replace ENCS 6043 with ENCS 6045 in the Graduate Certificate in Innovation, Technology and Society

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Following curriculum review discussions, I am writing to propose replacing ENCS 6043 – Seminar in Innovation Process with ENCS 6045 – Entrepreneurship and Innovation in the course lineup of the Graduate Certificate in Innovation, Technology and Society.

This modification will strengthen the certificate's focus on business innovation and social sustainability, areas currently under-represented in the curriculum. ENCS 6045 provides structured training in entrepreneurial thinking, opportunity recognition, and sustainable business development—key competencies for engineers and professionals engaging with innovation in societal contexts. The course explicitly bridges technological advancement with social and environmental sustainability through business innovation and entrepreneurial practice, aligning closely with the program's mission to explore how innovation shapes and serves society through business.

I respectfully request that this program change proposal be moved through the appropriate channels for implementation in the Graduate Certificate in Innovation, Technology and Society.

Graduate Program Regular Curriculum Change - GCS-ELEC-5916 - VERSION : 2

Summary and Rationale for Changes

COEN 6331 is going to be cross-listed with a new proposed undergraduate slot course COEN 498 (subsequently to be converted to a permanent course COEN 449) having the same title offered in the Fall term. The change in title reflects the fact that the course discusses applications of neural networks and machine learning to various engineering and computing fields. The prerequisite is removed because the course no longer focuses on linear systems. Finally, the material that is taught in this course is updated to actually reflect the explicit topics that have been taught in the recent past few years.

Resource Implications

None

Graduate Program Regular Curriculum Change - GCS-ELEC-5916 - VERSION : 2

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes in their final form (GCC 2526 3 D5). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Geoffrey Dover, Interim Dean, School of Graduate Studies,
The Graduate Curriculum Committee (GCC), 10 Nov 2025

Approved by:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 31 Oct 2025

At its meeting on October 31, 2025, the Council of the Gina Cody School of Engineering and Computer Science has reviewed and approved, as presented, the curriculum changes to COEN 6331 proposed by the Department of Electrical and Computer Engineering (ECE). Namely, the revisions include an update to the course title and course description of **COEN 6331 Neural Networks and Machine Learning** to more accurately reflect the course content taught in the class.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-ELEC- 5916 dossier.

We kindly request that this proposal be placed on the next agenda of the GCC for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 31 Oct 2025

Approved by:

B. Vermeire, Associate Dean,
Graduate Studies of the Gina Cody School of Engineering and Computer Science, 10 Oct 2025

At its meeting on October 10, 2025, the Graduate Studies of the Gina Cody School of Engineering and Computer Science reviewed and approved, with minor corrections, the changes to the course title and description of *COEN 6331 Neural Networks and Machine Learning* to better reflect the content covered in the course.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-ELEC- 5916 dossier.

We kindly request that this proposal be placed on the next agenda of the Council of the Gina Cody School of Engineering and Computer Science for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: Department approval

For Submission to:

W. Hamou-Lhadj, Professor and Chair,
Department Council, 16 May 2025

Approved by:

W-P Zhu, Associate Chair,
Graduate Studies Committee, 28 Apr 2025

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
COEN 6331 Neural Networks Change			✎	✎	✎	✎				

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
E48 - Computing Systems Change		✎	

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: COEN 6331 Neural Networks and Machine Learning

Calendar Section Name: E48 - Computing Systems
Calendar Section Type: Defined group
Description of Change: E48 - Computing Systems Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Electrical and Computer Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > List of Engineering Courses by Topic Areas

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
E48 - Computing Systems	**credits**	E48 - Computing Systems
COEN 6211 Biological Computing and Synthetic Biology (4) COEN 6311 Software Engineering (4) COEN 6312 Model-Driven Software Engineering (4) COEN 6313 Programming on the Cloud (4) COEN 6321 Evolutionary and Heuristic Learning Algorithms (4) COEN 6331 Neural Networks (4) COEN 6341 Embedded Systems Design (4) COEN 6351 Protocol Design and Validation (4) COEN 6371 Machine Learning for Cyber-Physical Systems (4) COEN 6611 Real-time Systems (4) COEN 6711 Microprocessors and Their Applications (4) COEN 6721 Fault-Tolerant Distributed Systems (4) COEN 6731 Distributed Software Systems (4) COEN 6741 Computer Architecture and Design (4) COEN 6751 Cyber-Physical Systems Modeling and Design (4) COEN 6761 Software Testing and Validation (4) ENGR 6231 Microfluidic Devices for Synthetic Biology (4)		COEN 6211 Biological Computing and Synthetic Biology (4) COEN 6311 Software Engineering (4) COEN 6312 Model-Driven Software Engineering (4) COEN 6313 Programming on the Cloud (4) COEN 6321 Evolutionary and Heuristic Learning Algorithms (4) COEN 6331 Neural Networks and Machine Learning (4) COEN 6341 Embedded Systems Design (4) COEN 6351 Protocol Design and Validation (4) COEN 6371 Machine Learning for Cyber-Physical Systems (4) COEN 6611 Real-time Systems (4) COEN 6711 Microprocessors and Their Applications (4) COEN 6721 Fault-Tolerant Distributed Systems (4) COEN 6731 Distributed Software Systems (4) COEN 6741 Computer Architecture and Design (4) COEN 6751 Cyber-Physical Systems Modeling and Design (4) COEN 6761 Software Testing and Validation (4) ENGR 6231 Microfluidic Devices for Synthetic Biology (4)
Note: The following courses are cross-listed: COEN 6211 is cross-listed with COEN 433 COEN 6313 is cross-listed with COEN 424 ~~COEN~~ 6321		Note: The following courses are cross-listed: COEN 6211 is cross-listed with COEN 433 COEN 6313 is cross-listed with COEN 424

D1

Present Text calendar	Proposed Text
is cross-listed with COEN 432	
	COEN 6321
ENGR 6231 is cross-listed with COEN 434	is cross-listed with COEN 432
COEN 6561 is cross-listed with COEN 422	
	ENGR 6231 is cross-listed with COEN 434
	COEN 6561 is cross-listed with COEN 422
	COEN 6331
	is cross-listed with COEN 449

Rationale:

The changes reflects the renaming of the course title and the addition of the undergraduate cross-listed course (COEN 449).

Resource Implications:

None.

D2

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: COEN 6331 Neural Networks and Machine Learning

Calendar Section Name: COEN 6331
Calendar Section Type: Course
Description of Change: COEN 6331 Neural Networks Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Electrical and Computer Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Electrical and Computer Engineering Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
COEN 6331 Neural ~~Networks~~ (4 credits)	COEN 6331 Neural Networks and Machine Learning (4 credits)
Prerequisites:	*Prerequisites:*
~~The following course must be completed previously: ENGR 6131 .~~	
Description :	*Description :*
~~Fundamentals~~ of ~~artificial~~ neural ~~networks; rigorous analysis~~ of ~~and introduction~~ to various network ~~paradigms:~~ perceptrons, backpropagation, counter-propagation, Hopfield nets, bi-directional associative memories, adaptive resonance theory, cognitron and ~~neocognitron;~~ neural network topologies, ~~memories, learning,~~ stability and ~~convergence; applications~~ to ~~adaptive knowledge, knowledge processing, classification, pattern recognition, signal processing, communications, robotics~~ and ~~control;~~ and ~~assessment of current neural network technology.~~ A project is required.	This course covers the fundamental principles of neural networks in the context of machine learning. It introduces students to various network concepts such as perceptrons, backpropagation, counter-propagation, Hopfield nets, bi-directional associative memories, adaptive resonance theory, cognitron and neocognitron, convolutional neural networks, deep neural networks, and reinforcement learning. In addition, this course provides a solid foundation in the principles and theories of the selection of network topologies, memory structures, learning paradigms, as well as their stability and convergence. Moreover, the course introduces students to applications of neural networks and machine learning to various engineering and computing fields. A project is required.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*
Other note :	**Other note :** This course is cross-listed with undergraduate course COEN 449.

Rationale:

COEN 6331 is going to be cross-listed with a new proposed undergraduate slot course COEN 498 (subsequently be converted to a permanent course COEN 449) having the same title offered in the Fall term. The change in title reflects the fact that the course discusses applications of neural networks and machine learning to various engineering and computing fields. The prerequisite is removed because the course no longer focuses on linear systems. Finally, the material that is taught in this course is updated to actually reflect the explicit topics that have been taught in the recent past few years.

Resource Implications:

None.

Impact Report

Defined Groups

Concentrations for the Electrical and Computer Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Electrical and Computer Engineering Programs -> Master/Magisteriate -> Electrical and Computer Engineering MEng -> Degree Requirements -> Electrical and Computer Engineering MEng
Source of Impact

- E48 - Computing Systems

E48 - Computing Systems
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> List of Engineering Courses by Topic Areas
Source of Impact

- COEN 6331

Topic Areas for the Electrical and Computer Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Electrical and Computer Engineering Programs -> Master/Magisteriate -> Electrical and Computer Engineering MEng -> Degree Requirements -> Electrical and Computer Engineering MEng
Source of Impact

- E48 - Computing Systems

Courses

COEN 449
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.60 Engineering Course Descriptions -> Computer Engineering Courses
Source of Impact

- COEN 6331

COEN6331
Neural Networks and Machine Learning (4 Credits)
Department of Electrical and Computer Engineering

Course Instructor:
Dr. K. Khorasani
kash@ece.concordia.ca
Office: EV 12-113

Office Hours: TBD

Course Calendar Description:

This course covers the fundamental principles of neural networks in the context of machine learning. It introduces students to various network concepts such as perceptrons, backpropagation, counter-propagation, Hopfield nets, bi-directional associative memories, adaptive resonance theory, cognitron and neocognitron, convolutional neural networks, deep neural networks, and reinforcement learning. In addition, this course provides a solid foundation in the principles and theories of the selection of network topologies, memory structures, learning paradigms, as well as their stability and convergence. Moreover, the course introduces students to applications of neural networks and machine learning to various engineering and computing fields.

Prerequisites: none

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

-Probability and statistics, and programming skills.

Course materials
• *Required textbook(s):*
  * S. Haykin, "Neural Networks and Learning Machines", 3rd Edition, 2009.
• *Suggested Textbook:*
  * J. M. Zurada, "Artificial Neural Systems"
  * J. A. Freeman and D. M. Skapura, "Neural Networks, Algorithms, Applications and Programming Techniques"
• ***Instructor's lecture notes: will be posted in Moodle course management site***
• *Software Use:* Matlab / Python

Grading Scheme

Evaluation Tool	Weight
Assignments	**30%**
Take Home Exam	**30%**
Project	**40%**
Total	**100%**

Tentative Course Schedule

Topics	Week
1. Introduction	1
2. Perceptron, Learning Discriminants, Delta Rule, Learning Paradigms	2
3. Layered Machines, Back Propagation, Generalized Delta Rule	3 & 4
4. Counter Propagation, Radial Basis Function Networks	5
5. Hopfield Networks	6
6. Associative Memories, Adaptive Bi-directional Associative Memories	7
7. Support Vector Machines	8
8. Adaptive Resonance Theory	9
9. Self-Organization Maps, Spatio-Temporal Maps	10
10. Cognitron and Neocognitron Networks (Introduction to Deep Learning Networks and Convolution Neural Networks)	11
11. Reinforcement Learning	12

Details on assessment tools:

TERM PROJECT

The students will work in a **team of two and three**. Once the teams are formed you will decide on which target application your project will be based on. As soon as you determine this you need to communicate and inform me of this decision.

Project Paper Topics. A file will be uploaded on Moodle that provides a sample of the papers that you can use as reference for selecting the paper that you then use as a basis of your project topic. Please note the following:

1. You work in the team that you have been assigned to prepare and complete your project.

2. The project report should be handed in in person at the time of presentation date that is set to December XYZ.

3. Each team member is responsible for making an oral presentation covering the most important content of the report. You need to partition your presentation into two halves so that each team member is allocated an equal time to present his/her portion of the work contained in the report.

4. Each team will be allocated a MAXIMUM of 6-8 minutes of presentation time, followed by 2-3 minutes of Q&A from the class participants.

5. The report should be organized along the lines of any standard technical report containing an abstract, introduction, problem statement, literature review, problem formulation, analysis, simulation results and comparative study, references and appendices. The overall length of the report should be kept to a maximum of 30 to 35 pages (single column format), inclusive of all appendices and simulations.

6. There are two approaches that you can use to conduct your project. In the first option your objective is to simply "apply" the methodology or technique that is contained in one of the listed papers and simply apply it to a different application domain that has not been done in the literature. In this option there is no expectation of developing or introducing a new or novel concept or "theory" but rather simply an "application" of a developed theory by the authors of your selected paper simply to a new application domain. The second option, for those that are more interested in theoretical development, is to simply make and introduce a "minor" extension of the result developed in your selected paper to the extent that is possible or by relaxing, if possible, one of the assumptions or conditions that are taken in the paper and develop a minor extension of the results. There is no expectation that this "extension" would represent a "major" advancement of the previously developed work. I am not expecting that this extension would be at par with the work that one does in a graduate thesis! An epsilon extension, modification, or relaxing of constraints or assumptions assumed in the paper will be sufficient and acceptable.

Only ONE report is to be handed in for each group. The *deadline* for submission of the report is the date of the **project presentation close to the end of the term.**

Graduate Attributes:

N/A

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

a) An ability to design and conduct experiments, as well as to analyze and interpret data. Students would be able to design neural networks to achieve certain specific goals.
b) An ability to learn by self-study, to integrate knowledge into one's overall education, and to engage in life-long learning. Every technical professional must be able to learn independently. For example, some instruction would be given on how one can pick out and summarize the important points in a chapter in a textbook. Then students are responsible for certain material on an exam, without that material being lectured on.
c) An ability to function in a team.
d) An ability to communicate effectively. It is expected that the students will prepare an acceptable written project report.
e) An ability to design a system, component, or process to meet desired needs. This includes instruction on the design processes appropriate for the systems under investigation.

Health and Safety Guidelines All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)
On Campus Resources Please visit Student services at Concordia University for the services available Gina Cody School students.

Graduate Program Regular Curriculum Change - GCS-ELEC-5806 - VERSION : 2

Summary and Rationale for Changes

Previous syllabus is too wide to allow adequate depth. The curriculum changes to the course ELEC 6071 include an update to the course title and course description of ELEC 6071 Mixed-Signal VLSI for Wireline Communication Systems to more accurately reflect the course content taught in the class.

Resource Implications

None

Graduate Program Regular Curriculum Change - GCS-ELEC-5806 - VERSION : 2

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes in their final form (GCC 2526 3 D4). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Geoffrey Dover, Interim Dean, School of Graduate Studies,
The Graduate Curriculum Committee (GCC), 10 Nov 2025

Approved by:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 31 Oct 2025

At its meeting on October 31, 2025, the Council of the Gina Cody School of Engineering and Computer Science has reviewed and approved, as presented, the curriculum changes to the course ELEC 6071 proposed by the Department of Electrical and Computer Engineering (ECE). Namely, the revisions include an update to the course title and course description of **ELEC 6071 Mixed-Signal VLSI for Wireline Communication Systems** to more accurately reflect the course content taught in the class.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-ELEC- 5806 dossier.

We kindly request that this proposal be placed on the next agenda of the GCC for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 31 Oct 2025

Approved by:

B. Vermeire, Associate Dean,
Graduate Studies of the Gina Cody School of Engineering and Computer Science, 10 Oct 2025

At its meeting on October 10, 2025, the Graduate Studies of the Gina Cody School of Engineering and Computer Science reviewed and approved, as presented, the changes to the course title and description of E*LEC 6071 Mixed-Signal VLSI for Wireline Communication Systems* to better reflect the content covered in the course.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-ELEC- 5806 dossier.

We kindly request that this proposal be placed on the next agenda of the Council of the Gina Cody School of

Engineering and Computer Science for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: Department approval

For Submission to:

B. Vermeire, Assoc. Dean, Graduate Studies,
Graduate Studies of the Gina Cody School of Engineering and Computer Science, 10 Oct 2025

Approved by:

A. Hamou-Lhadj, Professor and Chair,
Department Council, 16 May 2025

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ELEC 6071 Mixed-signal VLSI for Wireline Communication Systems Change			✎	✎		✎				

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
F03 - Microelectronic Systems Change		✎	

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: ELEC 6071

Calendar Section Name: F03 - Microelectronic Systems
Calendar Section Type: Defined group
Description of Change: F03 - Microelectronic Systems Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Electrical and Computer Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > List of Engineering Courses by Topic Areas

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
F03 - Microelectronic Systems	**credits**	F03 - Microelectronic Systems
COEN 6501 Digital System Design and Synthesis (4)		COEN 6501 Digital System Design and Synthesis (4)
COEN 6511 VLSI Circuit Design (4)		COEN 6511 VLSI Circuit Design (4)
COEN 6521 Design for Testability (4)		COEN 6521 Design for Testability (4)
COEN 6531 ASIC Synthesis (4)		COEN 6531 ASIC Synthesis (4)
COEN 6541 Functional Hardware Verification (4)		COEN 6541 Functional Hardware Verification (4)
COEN 6551 Formal Hardware Verification (4)		COEN 6551 Formal Hardware Verification (4)
ELEC 6051 Introduction to Analog VLSI (4)		ELEC 6051 Introduction to Analog VLSI (4)
ELEC 6071 Mixed-Signal VLSI for Communication Systems (4)		ELEC 6071 Mixed-Signal VLSI for Wireline Communication Systems (4)
ELEC 6081 Modern Analog Filter Design (4)		ELEC 6081 Modern Analog Filter Design (4)

Rationale:
A change in the course title

Resource Implications:
None

D1

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: ELEC 6071

Calendar Section Name: ELEC 6071
Calendar Section Type: Course
Description of Change: ELEC 6071 Mixed-signal VLSI for Wireline Communication Systems Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Electrical and Computer Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Winter 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Electrical and Computer Engineering Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ELEC 6071 Mixed-Signal VLSI for Communication Systems (4 credits)	ELEC 6071 Mixed-Signal VLSI for Wireline Communication Systems (4 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
~~Topics include~~ overview of ~~wireline~~ communication links, ~~mechanisms of signal degradation,~~ modulation formats, ~~TX/RX synchronization options,~~ IC technology limitations, transmitter ~~front-end circuits,~~ receiver ~~front-end~~ circuits, decision circuits, ~~clock and data recovery systems, phase-locked loops, jitter,~~ continuous-time and ~~discrete-time equalizers, system metrics.~~ A project is required.	This course covers integrated-circuit design of front-end circuits for Wireline communication systems. Specific topics include: an overview of Wireline communication links, modulation formats, inter-symbol interference, pulse response analysis, bit-error ratio, IC technology limitations, electrical and optical link transmitter and receiver front-end circuits, electrical and optical channels, current-mode logic decision circuits, continuous-time and discrete time equalizers. A project is required.
Component(s):	*Component(s):*
Lecture	Lecture
Notes :	*Notes :*
Equivalent Courses : Students who have received credit for ELEC 691 (Mixed-Signal VLSI for Communication Systems) may not take this course for credit.	**Equivalent Courses :** Students who have received credit for ELEC 691 (Mixed-Signal VLSI for Communication Systems) may not take this course for credit.
Other note : This is ~~a~~ cross-listed ~~course.~~	**Other note :** This course is cross-listed course with ELEC 413 .

Rationale:
The syllabus of ELEC 413/6071 is too wide, preventing proper coverage of it all in one term. To address this, I want to narrow its scope and move the extra material to a slot course. In the long term these two, related courses, both available to undergraduate students with ELEC 312: Electronics II and graduate students would be offered in alternate years.

Resource Implications:

Impact Report

Defined Groups

Concentrations for the Electrical and Computer Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Electrical and Computer Engineering Programs -> Master/Magisteriate -> Electrical and Computer Engineering MEng -> Degree Requirements -> Electrical and Computer Engineering MEng
Source of Impact

- F03 - Microelectronic Systems

F03 - Microelectronic Systems
Graduate -> See Winter 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> List of Engineering Courses by Topic Areas
Source of Impact

- ELEC 6071

Topic Areas for the Electrical and Computer Engineering MEng
Graduate -> See Winter 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Electrical and Computer Engineering Programs -> Master/Magisteriate -> Electrical and Computer Engineering MEng -> Degree Requirements -> Electrical and Computer Engineering MEng
Source of Impact

- F03 - Microelectronic Systems

Other Units

Addition of **ELEC 413** to **ELEC 6071** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

ELEC 413/6071
Mixed-Signal VLSI for Wireline Communication Systems
Electrical and Computer Engineering

Winter 2025
MB 2.430 SGW 2:45-5:30 pm Tuesdays

Course Instructor:
Glenn Cowan
glenn.cowan@concordia.ca
Office: EV5.167

Office Hours:

- Before and after lectures – location, near lecture hall
- Tuesday 1pm to 2pm (EV5.167)
- By appointment

Tutorials: None
Labs: Please see your class schedule for details
ELEC413: (undergrads), Tuesdays 10:15 AM to 1:00 PM, H915
ELEC6071: (grads), TBD

In the Labs (undergrads) and POD sessions (grads) students work through computer-aided design exercises meant to illustrate and reinforce lecture concepts. Student will also get help with the project

Attending Labs is a required aspect of the course.

Course Calendar Description:
ELEC 413/6071 (4 credits): Mixed-signal VLSI for wireline communication systems
This course covers integrated-circuit design of front-end circuits for wireline communication systems. Specific topics include: an overview of wireline communication links, modulation formats, inter-symbol interference, pulse response analysis, bit-error ratio, IC technology limitations, electrical and optical link transmitter and receiver front-end circuits, electrical and optical channels, current-mode logic decision circuits, continuous-time and discrete-time equalizers
A project is required.
Component(s): Lecture 3 hours per week; A project
Component specific to ELEC 413: 30h Laboratory

Prerequisites: *ELEC 312. Most relevant topics in bold*
ELEC 312: Electronics II: Differential and multi-stage amplifiers: differential pair; differential gain; common-mode gain and common-mode rejection ratio (CMRR) current mirrors. High frequency models: s-domain analysis, transfer functions; common gate, common source, common drain configurations; common base, common emitter, common collector configurations; **wide-band amplifiers. Feedback: general feedback structure; properties of negative feedback;** the four basic feedback configurations; loop gain and stability problems. Power amplifiers: classification and output stages; class A, B, C, and AB amplifiers;

biasing the class AB amplifier. Introduction to filters, tuned amplifiers, oscillators and mixers. PSPICE.

Specific Knowledge and Skills Needed for this Course:

Undergraduate students taking this course have taken Electronics II. Graduate students are expected to have a competency in these topics. Past final exams from this course will be posted to Moodle and will form the basis of the first assignment for graduate students.

Course materials

- **Required Textbook**: Cowan G. *Mixed-Signal CMOS for Wireline Communication: Transistor-Level and System-Level Design Considerations*. Cambridge University Press; 2024

Grading Scheme for Graduate and Undergraduate

Component	Percentage
Assignments/Labs	15
Project	30
Midterm	20
Final Exam (Date is TBD)	35

Although the weighting is the same, graduate students are expected to complete a more substantial project.

Tentative Course Schedule

Wk	Date	Text	Topics: Planned
1	1/14	Ch 1	Intro to course. Overview of data communication and typical block diagrams. Channel limitations, technology limitations, modulation formats
2	1/21	Ch 2	Electrical channels
3	1/28	Ch 3	Circuit review, CML decision circuits
4	2/4	Ch 4	Equalization
5	2/11	Ch 5	Electrical Tx circuits
6	2/18	Ch 6	Electrical Rx circuits and introduction of the project: topics, requirements, timeline
7	3/4		Midterm
8	3/11	Ch 7/8	Optical components and Optical Tx circuits
9	3/18	App B	Noise analysis
10	3/25	Ch 9	Optical Rx circuits
11	4/1	Various	Advanced design issues: link calibration and adaptation
12	4/8	Ch 11	Circuit design for PAM4 and ADC-based links

Lab Details

Please see the Moodle page for the labs as they are assigned.

Engineering Tools

In the labs, you will use the Cadence suite of computer-aided integrated circuit design tools.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

Graduate Program Regular Curriculum Change - GCS-BCEE-5989 - VERSION : 2

Summary and Rationale for Changes

The proposed change from "CIVI 7901: Environmental Engineering Research Project” to "BCEE 7901: Building, Civil and Environmental Engineering Research Project” is intended to extend this 8-credit research project course — previously available only to MEng (Environmental Engineering) students — to all MEng programs within the BCEE Department.

Resource Implications

No additional resources required.

Graduate Program Regular Curriculum Change - GCS-BCEE-5989 - VERSION : 2

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Mar 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 4 D1). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Program & Development / School of Graduate Studies,
The Graduate Curriculum Committee (GCC), 16 Mar 2026

Approved by:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 20 Feb 2026

At its meeting on February 20, 2026, the Council of the Gina Cody School of Engineering and Computer Science reviewed and approved the following curriculum item from the Department of Building, Civil & Environmental Engineering (BCEE). Namely, the creation of a new research project course *BCEE 7901 Building, Civil and Environmental Engineering Research*, thereby making it available to all MEng students within the Department, as well as some minor changes to the MEng programs' requirements.

There are no additional resources required.

Details of the curriculum changes are indicated and explained in the dossier GCS-BCEE-5989.

We kindly request that this proposal be placed on the next agenda of the GCC for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 20 Feb 2026

Approved by:

B. Vermeire, Associate Dean,
Graduate Studies of the Gina Cody School of Engineering and Computer Science, 30 Jan 2026

At its meeting on January 30, 2026, the Graduate Studies of the Gina Cody School of Engineering and Computer Science reviewed and approved, with some changes, the curriculum proposal from the Department of Building, Civil and Environmental Engineering (BCEE). Namely, the replacement of the research project course ***CIVI 7901 Environmental Engineering Research Project*** with ***BCEE 7901 Building, Civil and Environmental Engineering Research Project***, thereby making it available to all MEng students within the BCEE Department.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-BCEE-5989 dossier.

We kindly request that this proposal be placed on the next agenda of the Council of the Gina Cody School of Engineering and Computer Science for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: Department approval

For Submission to:

B. Vermeire, Associate Dean,
Graduate Studies Committee of The Gina Cody School of Engineering and Computer Science, 30 Jan 2026

Approved by:

S. Li, Chair,
Department Council, 26 Jan 2026

The dossier was approved with minor changes.

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
BCEE 7901 Building, Civil and Environmental Engineering Research Project New	★	★	★	★	★	★	★	★	★	
CIVI 7901 Environmental Engineering Research Project Delete	⊗	⊗	⊗	⊗	⊗		⊗	⊗	⊗	

Program Changes:

	Suspend Admissions	Program Degree Type Change	Program Title Change	Program Require-ments Change	Change to Program Type	Change to Total Credit Value of Program	Change to Primary Campus
Building Engineering MEng Change				✎			
Civil Engineering MEng Change				✎			
Construction Engineering and Management MEng Change				✎			
Environmental Engineering MEng Change				✎			

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Course code/title change for All MEng- Civi 7901 to BCEE 7901

Calendar Section Name: Building Engineering MEng
Calendar Section Type: Program
Description of Change: Building Engineering MEng Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Building, Civil and Environmental Engineering
Program Name: Building Engineering MEng
Program Type: Course-based
Degree: MEng

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Building, Civil and Environmental Engineering Programs > Master/Magisteriate > Building Engineering MEng > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
45 credits	Building Engineering MEng	**45 credits**	Building Engineering MEng
	5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) BLDG 6611 Building Science (4)		5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) BLDG 6611 Building Science (4)
	28 credits minimum chosen from the groups listed below to facilitate the selection of courses in a particular area of interest: Building Science (Building Engineering MEng)		28 credits minimum chosen from the groups listed below to facilitate the selection of courses in a particular area of interest: Building Science (Building Engineering MEng)
	Building Environment (Building Engineering MEng)		Building Environment (Building Engineering MEng)
	Energy Conversion (Building Engineering MEng)		Energy Conversion (Building Engineering MEng)
	Integrative Studies for Building Engineering (Building Engineering MEng) Note: A maximum of 2 courses (8 credits) can be taken from the Integrative Studies for Building Engineering (Building Engineering MEng) list to be counted towards the 28 credits. Additional courses from this list would count towards the 12-credit group below.		Integrative Studies for Building Engineering (Building Engineering MEng) Note: A maximum of 2 courses (8 credits) can be taken from the Integrative Studies for Building Engineering (Building Engineering MEng) list to be counted towards the 28 credits. Additional courses from this list would count towards the 12-credit group below.
	12 credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4- credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills		E63 - Project, Report And Industrial Training 12 credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4- credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills

D1

Present Text calendar	Proposed Text

Rationale:

The proposed change from "CIVI 7901: Environmental Engineering Research Project” to "BCEE 7901: Building, Civil and Environmental Engineering Research Project” is intended to extend this 8-credit research project course — previously available only to MEng (Environmental Engineering) students — to all MEng programs within the BCEE Department.

Resource Implications:

None

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Course code/title change for All MEng- Civi 7901 to BCEE 7901

Calendar Section Name: Civil Engineering MEng
Calendar Section Type: Program
Description of Change: Civil Engineering MEng Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Building, Civil and Environmental Engineering
Program Name: Civil Engineering MEng
Program Type: Course-based
Degree: MEng

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Building, Civil and Environmental Engineering Programs > Master/Magisteriate > Civil Engineering MEng > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
45 credits	Civil Engineering MEng	**45 credits**	Civil Engineering MEng
	5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) CIVI 6501 Foundation Engineering (4)		5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) CIVI 6501 Foundation Engineering (4)
	28 credits minimum chosen from the groups listed below, to facilitate the selection of courses in a particular area of interest. Structural Engineering (Civil Engineering MEng)		28 credits minimum chosen from the groups listed below, to facilitate the selection of courses in a particular area of interest. Structural Engineering (Civil Engineering MEng)
	Bridge Engineering (Civil Engineering MEng) Transportation Engineering (Civil Engineering MEng)		Bridge Engineering (Civil Engineering MEng) Transportation Engineering (Civil Engineering MEng)
	Geotechnical Engineering (Civil Engineering MEng)		Geotechnical Engineering (Civil Engineering MEng)
	Structural Mechanics (Civil Engineering MEng)		Structural Mechanics (Civil Engineering MEng) E63 - Project, Report And Industrial Training
	~~12~~ credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4-credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills		12 credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4-credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills

Rationale:

The proposed change from "CIVI 7901: Environmental Engineering Research Project" to "BCEE 7901: Building, Civil and Environmental Engineering Research Project" is intended to extend this 8-credit research project course — previously available only to MEng (Environmental Engineering) students — to all MEng programs within the BCEE Department.

Resource Implications:

None

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Course code/title change for All MEng- Civi 7901 to BCEE 7901

Calendar Section Name: Construction Engineering and Management MEng
Calendar Section Type: Program
Description of Change: Construction Engineering and Management MEng Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Building, Civil and Environmental Engineering
Program Name: Construction Engineering and Management MEng
Program Type: Course-based
Degree: MEng

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Building, Civil and Environmental Engineering Programs > Master/Magisteriate > Construction Engineering and Management MEng > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
45 credits	Construction Engineering and Management MEng	**45 credits**	Construction Engineering and Management MEng
	5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) BLDG 6571 Project Management (4)		5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) BLDG 6571 Project Management (4)
	28 credits minimum chosen from: BLDG 6241 Building Information Modelling in Construction (4) BLDG 6561 Building Economics I (4) BLDG 6631 Fundamentals of Facility Management (4) BLDG 6641 Modular and Off-site Construction (4) BLDG 6801 Construction Planning and Control (4) BLDG 6811 Labour and Industrial Relations in Construction (4) BLDG 6821 Legal Issues in Construction (4) BLDG 6831 Construction Processes (4) BLDG 6851 Project Cost Estimating (4) BLDG 6861 Simulations and Design of Construction Operations (4) BLDG 6921 Trenchless Technology for Rehabilitation Works (4) BLDG 7811 Project Acquisition and Control (4) BLDG 7831 Building Economics II (4) BLDG 7841 Information Technology Applications in Construction (4)		28 credits minimum chosen from: BLDG 6241 Building Information Modelling in Construction (4) BLDG 6561 Building Economics I (4) BLDG 6631 Fundamentals of Facility Management (4) BLDG 6641 Modular and Off-site Construction (4) BLDG 6801 Construction Planning and Control (4) BLDG 6811 Labour and Industrial Relations in Construction (4) BLDG 6821 Legal Issues in Construction (4) BLDG 6831 Construction Processes (4) BLDG 6851 Project Cost Estimating (4) BLDG 6861 Simulations and Design of Construction Operations (4) BLDG 6921 Trenchless Technology for Rehabilitation Works (4) BLDG 7811 Project Acquisition and Control (4) BLDG 7831 Building Economics II (4) BLDG 7841 Information Technology Applications in Construction (4)

Present Text calendar	Proposed Text
BLDG 7861 Business Practices in Construction (4) BLDG 7871 Construction Equipment Management (4) CIVI 6711 Asset Management for Sustainable Civil Infrastructure (4) CIVI 6731 Big Data Analytics for Smart Cities (4) CIVI 6721 Infrastructure Systems Modeling and Simulation (4) ~~12~~ credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4-credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills	BLDG 7861 Business Practices in Construction (4) BLDG 7871 Construction Equipment Management (4) CIVI 6711 Asset Management for Sustainable Civil Infrastructure (4) CIVI 6731 Big Data Analytics for Smart Cities (4) CIVI 6721 Infrastructure Systems Modeling and Simulation (4) E63 - Project, Report And Industrial Training 12 credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4-credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills

Rationale:

The proposed change from "CIVI 7901: Environmental Engineering Research Project" to "BCEE 7901: Building, Civil and Environmental Engineering Research Project" is intended to extend this 8-credit research project course — previously available only to MEng (Environmental Engineering) students — to all MEng programs within the BCEE Department.

Resource Implications:

None

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Course code/title change for All MEng- Civi 7901 to BCEE 7901

Calendar Section Name: Environmental Engineering MEng
Calendar Section Type: Program
Description of Change: Environmental Engineering MEng Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Building, Civil and Environmental Engineering
Program Name: Environmental Engineering MEng
Program Type: Course-based
Degree: MEng

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Building, Civil and Environmental Engineering Programs > Master/Magisteriate > Environmental Engineering MEng > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
45 credits	Environmental Engineering MEng	**45 credits**	Environmental Engineering MEng
	5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) CIVI 6611 Environmental Engineering (4)		5 credits of Core Courses: BCEE 6001 Graduate Seminar in Building and Civil Engineering (1) CIVI 6611 Environmental Engineering (4)
	28 credits minimum chosen from the groups listed below, to facilitate the selection of courses in a particular area of interest: Water Resources (Environmental Engineering MEng) Industrial Waste Management (Environmental Engineering MEng)		28 credits minimum chosen from the groups listed below, to facilitate the selection of courses in a particular area of interest: Water Resources (Environmental Engineering MEng) Industrial Waste Management (Environmental Engineering MEng)
	Environmental Engineering (Environmental Engineering MEng)		Environmental Engineering (Environmental Engineering MEng) E63 - Project, Report And Industrial Training
	~~12~~ credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4-credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills . Graduate courses outside engineering require GPD approval prior to registration.		12 credits maximum chosen from the Engineering Courses section. Four credits maximum (i.e.: one 4-credit course or four 1-credit courses) can be selected from Topic Area E09 - Professional Leadership Skills . Graduate courses outside engineering require GPD approval prior to registration.

Rationale:

The proposed change from "CIVI 7901: Environmental Engineering Research Project” to "BCEE 7901: Building, Civil and Environmental Engineering Research Project” is intended to extend this 8-credit research project course — previously available only to MEng (Environmental Engineering) students — to all MEng programs within the BCEE Department.

Resource Implications:

None

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Course code/title change for All MEng- Civi 7901 to BCEE 7901

Calendar Section Name: BCEE 7901
Calendar Section Type: Course
Description of Change: BCEE 7901 Building, Civil and Environmental Engineering Research Project New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Building, Civil and Environmental Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Building Engineering Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	BCEE 7901 Building, Civil and Environmental Engineering Research Project (8 credits)
Prerequisites:	*Prerequisites:* Students must have completed at least 12 credits from the MEng programs in the Department of Building, Civil and Environmental Engineering prior to enrolling. Permission of the Department Graduate Program Director is required.
Description :	*Description :* This is a research project to be completed under the supervision of a full-time faculty member from the department. The research topic must be in the field of building, civil or environmental engineering, and should be selected in consultation and with the approval of a faculty supervisor. The course is graded on the basis of the student's performance during two terms, which includes a technical report comprising original research work that is assessed by two faculty members in the area.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Other note :	**Other note :** This course is offered over two consecutive terms. This course cannot be taken for credit if the student has completed any of the following courses: ENGR 6971 , ENGR 6981 , ENGR 6991 .

Rationale:

The proposed change from "CIVI 7901: Environmental Engineering Research Project" to "BCEE 7901: Building, Civil and Environmental Engineering Research Project" is intended to extend this 8-credit research project course — previously available only to MEng (Environmental Engineering) students — to all MEng programs within the BCEE Department.

This course will be listed in Topic Area E63 which is in use by another department.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Course code/title change for All MEng- Civi 7901 to BCEE 7901

Calendar Section Name: CIVI 7901
Calendar Section Type: Course
Description of Change: CIVI 7901 Environmental Engineering Research Project Delete

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Building, Civil and Environmental Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Civil Engineering Courses

Type of Change: Course Deletion

Present Text calendar	Proposed Text
~~CIVI 7901 Environmental Engineering Research Project~~ (~~8~~ credits)	
Prerequisites:	*Prerequisites:*
~~Students must have completed at least 20 credits in the Environmental Engineering program prior to enrolling.~~	
~~Permission of the Department Graduate Program Director is required.~~	
Description :	*Description :*
~~This is a research project to be completed under the supervision of a full-time faculty member from the Department. The research topic must be in the field of environmental engineering, and should be selected in consultation and with the approval of a faculty supervisor. The course is graded on the basis of the student's performance during the work period, which includes a technical report that is assessed by two faculty members in the area.~~	
Component(s):	*Component(s):*
~~Lecture~~	
Notes :	*Notes :*
Anti-requisite Courses : ~~This course is offered over two terms (Fall and Winter). This course cannot be taken for credit if the student has completed any of the following courses: ENCS 6931, ENGR 6971 , ENGR 6981, ENGR 6991 .~~	**Anti-requisite Courses :**

Rationale:

This proposal seeks to revise the research project course "CIVI 7901: Environmental Engineering Research Project" to "BCEE 7901: Building, Civil and Environmental Engineering Research Project," thereby making the course available to students across all MEng programs within the BCEE Department.

Resource Implications:
None

Impact Report

Defined Groups

E63 - Project, Report And Industrial Training

Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> List of Engineering Courses by Topic Areas

Source of Impact

- CIVI 7901

Other Units

Addition of **E63 - Project, Report And Industrial Training** to **Building Engineering MEng** requirement

Source of other unit Impact

- Defined group is housed in Engineering Courses

Addition of **E63 - Project, Report And Industrial Training** to **Civil Engineering MEng** requirement

Source of other unit Impact

- Defined group is housed in Engineering Courses

Addition of **E63 - Project, Report And Industrial Training** to **Construction Engineering and Management MEng** requirement

Source of other unit Impact

- Defined group is housed in Engineering Courses

Addition of **E63 - Project, Report And Industrial Training** to **Environmental Engineering MEng** requirement

Source of other unit Impact

- Defined group is housed in Engineering Courses

Graduate Program Regular Curriculum Change - GCS-COMP-5971 - VERSION : 10

Summary and Rationale for Changes

Converting graduate slot courses into cross-listed graduate courses COMP 6802, SOEN 6121, SOEN 6131, SOEN 6141. Course outlines are attached.

Should be approved with the undergraduate versions of these courses in dossier: GCS-COMP-5970

Resource Implications

These courses have previously been taught as a slot course and therefore has no additional resource implications.

Graduate Program Regular Curriculum Change - GCS-COMP-5971 - VERSION : 10

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Mar 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 4 D2). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Program & Development / School of Graduate Studies,
The Graduate Curriculum Committee (GCC), 16 Mar 2026

Approved by:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 20 Feb 2026

At its meeting on February 20, 2026, the Council of the Gina Cody School of Engineering and Computer Science reviewed and approved the curriculum item from the Department of Computer Science and Software Engineering(CSSE). Namely, the creation of the following four new courses: COMP 6802, SOEN 6121, SOEN 6131, and SOEN 6141 which were previously offered as slot courses, as well as some changes to topic areas C11 and C13. In addition, these courses will be cross-listed with the equivalent undergraduate courses.

There are no additional resources required.

Details of the curriculum changes are indicated and explained in the dossier GCS-COMP-5971.

We kindly request that this proposal be placed on the next agenda of the GCC for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 20 Feb 2026

Approved by:

B. Vermeire, Associate Dean,
Graduate Studies of the Gina Cody School of Engineering and Computer Science, 30 Jan 2026

At its meeting on January 30, 2026, the Graduate Studies of the Gina Cody School of Engineering and Computer Science reviewed and approved, with some changes, the curriculum proposal from the Department of Computer Science and Software Engineering. Namely, the creation of the following courses COMP 6802, SOEN 6121, SOEN 6131, and SOEN 6141.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-COMP-5971 dossier.

We kindly request that this proposal be placed on the next agenda of the Council of the Gina Cody School of Engineering and Computer Science for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: Department approval

For Submission to:

Brian Vermeire, Associate Dean, Graduate Studies,
Graduate Studies Committee meetings, 08 Jan 2026

Approved by:

Joey Paquet, Chair, Dept of CSSE,
CSSE Department Council, 12 Dec 2025

Unanimously approved at CSSE department meeting. Note these courses are cross-listed in the undergraduate dossier GCS-COMP-5970.

(Note, the SOEN courses were already approved, but COMP 6802 was unanimously approved at the CSSE department meeting on Jan 16, 26)

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
COMP 6802 Distributed Learning New	★	★	★	★	★	★	★	★	★	
SOEN 6121 Generative Artificial Intelligence for Software Engineering New	★	★	★	★		★	★	★	★	
SOEN 6131 Automated Program Analysis and Synthesis New	★	★	★	★		★	★	★	★	
SOEN 6141 AI-Driven Software Improvement and Repair New	★	★	★	★		★	★	★	★	

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
C07 - Artificial Intelligence Change		✎	
C11 - Software Maintenance and Quality Change		✎	
C13 - Software Engineering Change		✎	

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: C07 - Artificial Intelligence
Calendar Section Type: Defined group
Description of Change: C07 - Artificial Intelligence Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > List of Computer Science Courses by Topic Areas

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
C07 - Artificial Intelligence	**credits**	C07 - Artificial Intelligence
COMP 6321 Machine Learning (4) COMP 6531 Foundations of the Semantic Web (4)		COMP 6321 Machine Learning (4) COMP 6531 Foundations of the Semantic Web (4)
COMP 6721 ~~Applied~~ Artificial Intelligence (4) COMP 6741 Intelligent Systems (4) COMP 6751 Computational Linguistics (4) COMP 6781 Natural Language Processing (4) COMP 6791 Information Retrieval and Web Search (4) COMP 6801 Deep Learning (4) COMP 6861 Conversational Artificial Intelligence (4) SOEN 6221 Engineering AI-Based Software Systems (4)		COMP 6721 Symbolic Artificial Intelligence (4) COMP 6741 Intelligent Systems (4) COMP 6751 Computational Linguistics (4) COMP 6781 Natural Language Processing (4) COMP 6791 Information Retrieval and Web Search (4) COMP 6801 Deep Learning (4) COMP 6802 Distributed Learning (4) COMP 6861 Conversational Artificial Intelligence (4) SOEN 6221 Engineering AI-Based Software Systems (4)
Note: The following courses are cross-listed: COMP ~~6741,~~ COMP ~~6791.~~		Note: The following courses are cross-listed: COMP 6741 is cross-listed with COMP 474; COMP 6791 is cross-listed with COMP 479; and COMP 6802 is cross-listed with COMP 434.

Rationale:
Adding COMP 6802 to group "C07 - Artificial Intelligence and Human-Machine Communication".

Resource Implications:

D1

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: C11 - Software Maintenance and Quality
Calendar Section Type: Defined group
Description of Change: C11 - Software Maintenance and Quality
Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > List of Computer Science Courses by Topic Areas

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
C11 - Software Maintenance and Quality	**credits**	C11 - Software Maintenance and Quality
SOEN 6431 Software Comprehension and Maintenance (4) SOEN 6491 Software Refactoring (4) SOEN 6591 Software Mining and Analysis (4) SOEN 6611 Software Measurement (4) SOEN 7481 Software Verification and Testing (4)		SOEN 6131 Automated Program Analysis and Synthesis (4) SOEN 6431 Software Comprehension and Maintenance (4) SOEN 6491 Software Refactoring (4) SOEN 6591 Software Mining and Analysis (4) SOEN 6611 Software Measurement (4) SOEN 7481 Software Verification and Testing (4) Note: The following course is cross-listed: SOEN 6131 is cross-listed with COMP 434

Rationale:
Adding slot course to Maintenance and quality group

Resource Implications:

D2

DEFINED GROUP CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: C13 - Software Engineering
Calendar Section Type: Defined group
Description of Change: C13 - Software Engineering Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > List of Computer Science Courses by Topic Areas

Type of Change: Defined Group Change

Present Text calendar		Proposed Text
C13 - Software Engineering	**credits**	C13 - Software Engineering
SOEN 6111 Big Data Analytics (4) SOEN 6211 Semantic Computing (4) SOEN 6761 Multimedia Computing (4) SOEN 6941 Software Engineering Project (4) SOEN 6951 Software Engineering Case Study (4) <br~~Note:~~ The following ~~course is~~ cross-listed: SOEN ~~6111.~~		SOEN 6111 Big Data Analytics (4) SOEN 6121 Generative Artificial Intelligence (GenAI) for Software Engineering (4) SOEN 6141 AI-Driven Software Improvement and Repair (4) SOEN 6211 Semantic Computing (4) SOEN 6761 Multimedia Computing (4) SOEN 6941 Software Engineering Project (4) SOEN 6951 Software Engineering Case Study (4) Note: The following courses are cross-listed: SOEN 6111 with SOEN 471 , SOEN 6121 with SOEN 472 , SOEN 6141 with SOEN 474 .

Rationale:
Adding new slot courses to SE grouping

Resource Implications:
None

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: COMP 6802
Calendar Section Type: Course
Description of Change: COMP 6802 Distributed Learning New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > Computer Science and Software Engineering Master's and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	COMP 6802 Distributed Learning (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: COMP 6801 or permission of instructor.
Description :	*Description :* This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods will also be studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students will engage critically with current research through regular readings and presentations of recent papers. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 691 (Robust and Federated Learning) may not take this course for credit.
Anti-requisite Courses :	**Anti-requisite Courses :** Students who have completed COMP 434 may not take this course for credit.

Rationale:

Converting an existing grad course to a permanent cross-listed course. The slot course was offered three times: Fall 2023=20 students, Winter 2025=12 students, and Fall 2025=15 students. Allowing undergrads to take the course will provide much needed electives to the over 300 students in their final year of CSSE.

Resource Implications:

This course has previously been taught as a slot course and therefore has no additional resource implications.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: SOEN 6121
Calendar Section Type: Course
Description of Change: SOEN 6121 Generative Artificial Intelligence for Software Engineering New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > Computer Science and Software Engineering Master's and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	SOEN 6121 Generative Artificial Intelligence (GenAI) for Software Engineering (4 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* This course introduces key concepts about using GenAI in software engineering practice and research. The course will include sessions on the topics of prompt engineering and fine-tuning large language models for software engineering research. Subsequently, the course will focus on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, the course covers special topics related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of GenAI. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for SOEN 691 (Generative Artificial Intelligence for Software Engineering) may not take this course for credit.
Anti-requisite Courses :	**Anti-requisite Courses :** Students who have completed SOEN 472 may not take this course for credit.

Rationale:
Converting an existing grad course to a permanent cross-listed course. The slot course was offered three times: Winter 2024=39 students, Winter 2025=38 and Winter 2026=17. Allowing undergrads to take the course will also provide much needed electives to the over 300 students in their final year of CSSE.

Resource Implications:

This course has previously been taught as a slot course and therefore has no additional resource implications.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: SOEN 6131
Calendar Section Type: Course
Description of Change: SOEN 6131 Automated Program Analysis and Synthesis New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > Computer Science and Software Engineering Master's and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	SOEN 6131 Automated Program Analysis and Synthesis (4 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
	This course introduces key program analysis techniques in automated debugging (e.g., delta debugging and statistical fault localization) and automated program repair (such as genetic improvement, template-based approach). Topics include algorithms of existing debugging techniques, control-flow and data-flow analysis, improving quality of auto-generated code, and test-driven program repair. After learning the basic program analysis techniques, the emerging AI-assisted techniques that use program analysis will be discussed and presented. Students will work in a team for a course project where students will improve existing program analysis tools by fixing bugs listed in the open-source GitHub repositories. A project is required.
Component(s):	*Component(s):*
	Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for SOEN 691 (Software Debugging and Repair) may not take this course for credit.
Anti-requisite Courses :	**Anti-requisite Courses :** Students who have completed SOEN 473 may not take this course for credit.

Rationale:
Converting an existing grad course to a permanent cross-listed course. The slot course was offered twice: Fall 2024=15 students, Fall 2025=15 students. Allowing undergrads to take the course will provide much needed electives to the over 300 students in their final year of CSSE.

Resource Implications:

This course has previously been taught as a slot course and therefore has no additional resource implications.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Conversion of slot courses to permanent and crosslisted

Calendar Section Name: SOEN 6141
Calendar Section Type: Course
Description of Change: SOEN 6141 AI-Driven Software Improvement and Repair New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Computer Science and Software Engineering Courses > Computer Science and Software Engineering Master's and PhD Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	SOEN 6141 AI-Driven Software Improvement and Repair (4 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students will examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for SOEN 691 (Automated Software Debugging and Repair) may not take this course for credit.
Anti-requisite Courses :	**Anti-requisite Courses :** Students who have completed SOEN 474 may not take this course for credit.

Rationale:
Converting an existing grad course to a permanent cross-listed course. The slot course was offered twice: Fall 2022=13 students and Fall 2025=11 students. Allowing undergrads to take the course will provide much needed electives to the over 300 students in their final year of CSSE.

Resource Implications:

This course has previously been taught as a slot course and therefore has no additional resource implications.

Impact Report

Programs

Computer Science MCompSc
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Computer Science and Software Engineering Programs -> Master/Magisteriate -> Computer Science MCompSc -> Degree Requirements
Source of Impact

- C07 - Artificial Intelligence
- C11 - Software Maintenance and Quality
- C13 - Software Engineering

Software Engineering MASc
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Computer Science and Software Engineering Programs -> Master/Magisteriate -> Software Engineering MASc -> Degree Requirements
Source of Impact

- C07 - Artificial Intelligence
- C11 - Software Maintenance and Quality
- C13 - Software Engineering

Defined Groups

Applied Computer Science MAPCompSc Electives
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Computer Science and Software Engineering Programs -> Master/Magisteriate -> Applied Computer Science MApCompSc -> Degree Requirements -> Applied Computer Science MApCompSc
Source of Impact

- C07 - Artificial Intelligence
- C11 - Software Maintenance and Quality
- C13 - Software Engineering

E71 - Computer Science
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> List of Engineering Courses by Topic Areas
Source of Impact

- C07 - Artificial Intelligence

E73 - Software Engineering
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> List of Engineering Courses by Topic Areas
Source of Impact

- C13 - Software Engineering

Software Engineering MEng Electives
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Computer Science and Software Engineering Programs -> Master/Magisteriate -> Software Engineering MEng -> Degree Requirements -> Software Engineering MEng
Source of Impact

- C07 - Artificial Intelligence
- C11 - Software Maintenance and Quality
- C13 - Software Engineering

Courses

COMP 6802 Distributed Learning New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

SOEN 6121 Generative Artificial Intelligence for Software Engineering New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

SOEN 6131 Automated Program Analysis and Synthesis New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

SOEN 6141 AI-Driven Software Improvement and Repair New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Computer Science and Software Engineering Courses -> Computer Science and Software Engineering Master's and PhD Courses
Source of Impact

Other Units

Addition of **SOEN 471** to **C13 - Software Engineering** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 472** to **C13 - Software Engineering** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 474** to **C13 - Software Engineering** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 434** to **C11 - Software Maintenance and Quality** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 474** to **SOEN 6141** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 472** to **SOEN 6121** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 473** to **SOEN 6131** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 434** to **COMP 6802** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Course Proposal:
COMP 6802/ COMP 434 Distributed Learning

Eugene Belilovsky

Department of Computer Science and Software Engineering

Background and Motivation

Large-scale machine learning is now central to a wide range of industrial and scientific applications, including autonomous systems, recommendation engines, foundation models (vision/language), scientific computing, and healthcare decision support. In many of these areas, modern models and datasets have grown to the point where training on a single machine is no longer sufficient**.** As a result, it has become common practice to train deep learning models on multi-GPU and multi-node clusters**,** and familiarity with distributed training has become a core skill set for students pursuing careers in machine learning research, applied ML, and ML systems.

Distributed learning addresses the challenge of scaling training across multiple compute devices by leveraging methods such as distributed data parallelism, communication-efficient optimization, asynchronous training, and model-parallel techniques (pipeline/tensor/sharding)**.** These techniques are used routinely in research labs and industry to reduce training time, increase model capacity, and enable experimentation at realistic scales.

At the same time, in many real-world settings data cannot be centralized due to privacy, ownership, regulatory, or logistical constraints (e.g., user devices, hospitals, companies). Federated learning extends distributed learning to this decentralized-data regime, introducing additional challenges such as client heterogeneity, partial participation, privacy attacks/defenses, personalization, and secure aggregation**.** Consequently, federated learning is both an important application of distributed learning principles and a major research area in its own right.

The goal of the proposed course is to introduce both the theoretical foundations and the practical implementation skills required to train and deploy machine learning models in distributed environments—ranging from multi-node cluster training to privacy-preserving federated variants. The course is aimed at graduate students (and advanced undergraduates) and will mix formal lectures with student-led paper discussions. Students will learn to read and critically evaluate papers in distributed optimization, distributed deep learning systems, and federated learning.

Throughout the semester, students working in groups of two will lead paper discussions corresponding to the topic of the week. Each student will present once during the semester**.** Students will also complete two problem sets. In addition, a semester-long final project will be required: students will work in groups on a project that includes implementing and experimenting

with distributed training methods on realistic multi-GPU/multi-node settings and to incorporate federated learning algorithms and privacy-preserving techniques as a project focus.

Commented [JR1]: Can you add maybe 1-2 sentences that the course will complement and strengthen our existing AI offerings at both undergraduate and graduate.

Overall, this course will complement and strengthen the existing AI offerings of the Department at both the undergraduate and graduate level.

Calendar Descriptions 6802

Prerequisite: COMP 6801 or permission of instructor

This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods will also be studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students will engage critically with current research through regular readings and presentations of recent papers.
A project is required.

Calendar Descriptions 434 Distributed Learning

Prerequisite: COMP 433 or permission of instructor

This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods will also be studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students will engage critically with current research through regular readings and presentations of recent papers.

Credits

Graduate course COMP 6802 Distributed Learning: 4 credits.

Undergraduate course COMP 434 Distributed Learning: 4 credits

Time of Offering

Winter semester

Grading Scheme

Assignments:	15%
Exams:	35%
Project:	30%
Presentations:	20%

Lecture Schedule

Lectures: two and half hours per week.

Week 1 : Introduction: Gradient Descent, Distributed Data Parallelism
Week 2 : Communication-Efficient Data Parallelism: Gossip, Local SGD, Communication Compression
Week 3: Federated Learning: Client Drift, Heterogeneity, Privacy, Personalization
Week 4 : Theoretical Analysis of Distributed Optimization
Week 5 : Model Parallelism 1: Pipelining, Tensor Parallelism, Context Parallelism
Week 6 : Model Parallelism 2: Sharded Parallelism, Implementations
Week 7 : Asynchrony and Communication Overlap
Week 8 : Recent Advances Federated Learning
Week 9 : Recent Advances Decentralized Learning
Week 10 : Recent Advances in Model Parallelism
Week 11 : Recent Advances in Asynchronous Methods
Week 12 : Final Project Presentations

Enrollment History

The course has been offered three times as a graduate course. With the following enrollments Winter 2023: 20, Fall 2024: 12, Winter 2025: 15. This included significant students from other universities. Based on student feedback, the material has evolved from an initial emphasis primarily on federated learning to a broader and more practically oriented focus on distributed learning and training on multi-node clusters, while maintaining federated learning as a key application area.

Commented [JR2]: Can you list them by year of offering e.g. Winter 2023 : XX , Winter 2024: YY

Relation to other courses

COMP 6321 Machine Learning**.** This course teaches advanced concepts in machine learning and is a pre-requisite for the current course. The overlap with the proposed course is less than 5%

COMP 691 Deep Learning. This course covers some of the introductory material on optimization in deep networks from Week 1, but does not cover any of the other topics. The overlap with the proposed course is less than 10%

COMP 6731 Pattern Recognition. This course is focused more on image processing and clustering algorithms. It covers feature extraction and selection, similarity between patterns and distance measurements, syntactic and statistical approaches, clustering analysis, Bayesian decision theory and

discriminant functions, and clustering and classification techniques. The overlap with the proposed course is less than 5%.

COMP 7551 Advanced Pattern Recognition. This course builds on COMP 6731 and focuses on advanced topics in image processing and clustering techniques as well as touching on neural networks methods. The overlap with the proposed course is less than 5%.

COMP 6721 Applied Artificial Intelligence
The course covers heuristic and adversarial searches for concrete applications. It then discusses automated reasoning, advanced knowledge representation and dealing with uncertainly for Artificial Intelligence applications. Finally, it introduces autoencoders, recurrent neural networks and sequence to sequence models. A project is required. The overlap with the proposed course is less than 5%.

INSE 6690 Fundamentals of Federated Learning
This course provides a broader overview of federated learning with a focus on applications in IoT including case studies in healthcare, smart cities, Internet of Things, and blockchain technology. There is also a greater emphasis on privacy preserving techniques such as differential privacy and secure multi-party-computation, homomorphic encryption, privacy-preserving protocols. On the other hand the proposed course is focused on the machine learning theory, machine learning algorithms, and the related state of the art algorithms and general distributed learning approaches. The overlap with the proposed course is less than 10%.

References

McMahan, H. B., Moore, E., Ramage, D., Hampson, S., & Agüera y Arcas, B. (2017). *Communication-efficient learning of deep networks from decentralized data.* Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS), Proceedings of Machine Learning Research, 54, 1273–1282.

Li, T., Sahu, A. K., Talwalkar, A., & Smith, V. (2020). *Federated learning: Challenges, methods, and future directions.* IEEE Signal Processing Magazine, 37(3), 50–60.

Hsieh, K., Phanishayee, A., Mutlu, O., & Gibbons, P. B. (2020). *The non-IID data quagmire of decentralized machine learning.* Proceedings of the 37th International Conference on Machine Learning (ICML), Proceedings of Machine Learning Research, 119, 4387–4398.

Narayanan, D., Harlap, A., Phanishayee, A., Seshadri, V., Devanur, N. R., Ganger, G. R., Gibbons, P. B., & Zaharia, M. (2019). *PipeDream: Generalized pipeline parallelism for DNN training.* Proceedings of the 27th ACM Symposium on Operating Systems Principles (SOSP), 1–15.

Shoeybi, M., Patwary, M., Puri, R., LeGresley, P., Casper, J., & Catanzaro, B. (2019). *Megatron-LM: Training multi-billion parameter language models using model parallelism.* arXiv preprint arXiv:1909.08053.

Rajbhandari, S., Rasley, J., Ruwase, O., & He, Y. (2020). *ZeRO: Memory optimizations toward training trillion parameter models.* Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC20).

Douillard, A., Feng, Q., Rusu, A. A., Chhaparia, R., Donchev, Y., Kuncoro, A., Ranzato, M., Szlam, A., & Shen, J. (2023). *DiLoCo: Distributed low-communication training of language models.* arXiv preprint arXiv:2311.08105.

SOEN 472
Generative Artificial Intelligence for Software Engineering
Computer Science and Software Engineering
Winter 2026

Course Instructor:
Diego Elias Damasceno Costa
diego.costa@concordia.ca

Office Hours:
Thursdays – 15:00-16:00 – ER1231

Labs: Please see your class schedule for details
Lab Demonstrators: Kawsar Ahmed Bhuyian

Course Calendar Description:
This course introduces key concepts about using GenAI in software engineering practice and research. The course will include sessions on the topics of prompt engineering and fine-tuning large language models for software engineering research. Subsequently, the course will focus on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, we will cover special topics in the course related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of generative AI. A project is required.

Laboratory. Each week, the lecture will be complemented by a 1-hour laboratory session, equipped with prepared materials to guide students in running experiments with LLMs for software engineering research.

Course project. Students will be required to work as teams on the course project. Undergraduate students will have the option to choose a more practical project: develop an LLM-based solution for software engineering practitioners and write a detailed report on the process.

***Lectures**:* three hours per week.
***Laboratories**:* two hours per week.

Prerequisites: N/A
Co-requisites: N/A
Cross listed course: SOEN 472: Graduate students will be required to complete a research project as part of their course project. Undergraduate students will be required to complete a GenAI tool/software development as part of their course project.

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Understanding of the Software Engineering lifecycle
    - Software requirements
    - Software design and development
    - Software testing and maintenance
- Basic understanding of Machine Learning
    - Training supervised machine learning models.
- Programming logic

Course materials
Required Textbook: There are no required textbook as students will be assigned papers to read every week. Some of the material will be based on the following book:

- *Huyen, C. 2024. AI Engineering: Building Applications with Foundation Models. 1st edn. O'Reilly Media, Sebastopol, CA. ISBN 978-1-098-16630-4*

Grading Scheme
Grades will be based on class participation, assignments in the form of paper critiques, lab assignments, in- class exams, and a group project involving researching the application of GenAI in Software Engineering problems. As part of the course project, students will be expected to produce a final report detailing their techniques and findings.

Deliverable	**% of final grade**
Class participation	10%
Lab Assignments	15%
Paper Reviews	15%
Quiz	20%
Course project	40%
Total	**100%**

Class Participation
Students are expected to attend all classes. In each class, we will have discussions based on the assigned readings. Students are expected to participate and make meaningful contributions.

Lab Assignments. Each week, the lecture will be complemented by a 2-hour laboratory session, equipped with prepared materials to guide students in running experiments with LLMs for software engineering research.

Paper Critiques

In most weeks, students will be assigned one to two research papers (or chapters) to read. Each student is expected to send a critique of one of the papers that are being presented. The critique should include a brief summary of the paper, at least three strengths of the paper and at least three weaknesses of the paper.

Course project. A large portion of the course deliverables is a course research project. You are expected to work on the course project in groups. Each group is expected to write a research paper by the end of the semester. The topic is to be determined with the instructor. Examples include a new contribution on a specific related topic, a survey paper of a related topic (typically involves surveying 30 – 60 papers) or building a tool that integrates GenAI to solve software engineering problems.

- Undergraduate students will have the option to choose a more practical project: develop an LLM-based solution for software engineering practitioners and write a detailed report on the process.

Tentative Course Schedule

The table below outlines a possible schedule for this course over a 12-week term. Slight modifications to content may occur based on the background and abilities of students.

Week(s)	Topics
1	Introduction to GenAI in Software Engineering
2	Prompt Engineering for Practitioners and Researchers
3	Embedding SE Expertise in Foundational Models (RAG, Agents)
4	Experiment Design for Software Engineering Studies with GenAI
5	GenAI applied to Software Requirements
6	GenAI applied to Software Design
7	GenAI applied to Software Development
8	GenAI applied to Software Testing
9	GenAI applied to Software Maintenance and Repair
10	Special topics: Engineering Agentic Systems
11	**Quiz**
12	**Final Project presentation**

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

- **Comprehend GenAI Foundations**. Explain the fundamental principles, capabilities, and evolution of Generative AI and Large Language Models (LLMs), specifically within the context of software engineering.

- **Apply Domain-Embedding Techniques to LLMs**. Apply specific techniques (e.g., as Prompt Engineering, RAG and Fine-tuning) to optimize off-the-shelf LLMs for domain-specific software tasks.
- **Understand the Challenges of Developing GenAI-based Systems**. Design and evaluate strategies for implementing and deploying software systems that contain GenAI components.
- **Evaluate Risks and Ethics**. Critically assess the limitations and risks associated with LLMs (e.g., non-determinism, lack of transparency/explainability) and analyze the ethical and societal implications of deploying these tools in professional practice.
- **Learn Fundamentals of SE Research**. Understand the different types of study designs, and scientific methodology for research the application of GenAI to SE tasks.

Enrollment information
The course is expected to host between 20 to 40 students. In the last two sessions of the course, the enrollment of students reached 39 and 38 students.

Notes
This course is cross listed with SOEN 472.

Exclusions
The original slot course SOEN 691: Generative Artificial Intelligence for Software Engineering.

Resource implications
This course has previously been taught as a slot course and therefore has no additional resource implications.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

SOEN 6141
AI-Driven Software Improvement and Repair
Computer Science and Software Engineering
Fall 2027

Course Instructor:
Dr. Jinqiu Yang
jinqiu.yang@concordia.ca
Associate Professor; Director of O-RISA lab

Office Hours:
Email me to schedule an appointment

Tutorials: Please see your class schedule for details
Tutors: N/A

Labs: Please see your class schedule for details
Lab Demonstrators: *N/A*

Course Calendar Description:
This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students will examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems. A project is required.

Prerequisites: *None*
Co-requisites:
Cross-listed course: SOEN 474 (Graduate students of this course will work on a research project about applying AI techniques to advance automated software improvement and repair)

Specific Knowledge and Skills Needed for this Course:
Students should know to program in one of the common programming languages, e.g., Java or Python. Basic concepts on software development process, debugging and testing are required.

Course materials
Required Textbook: *N***o textbooks. The reading materials include research papers and articles.**

Grading Scheme

Items	% of final grade	Notes

Class Participation	10%	Each week, students are expected to participate in the paper discussions when applicable.
Lab assignment(s)	20%	Students are required to finish lab assignments that cover relevant techniques on AI-driven software improvement and repair that are taught in the course.
Course project	20%	Each group of students needs to submit an original 10-page project report in either IEEE or ACM double column format
Research project	20%	Individual research project. Each student needs to submit an original 10-page report in either IEEE or ACM double column format.
Exam	30%	
Total	100%	

Tentative Course Schedule

Week(s)	Topics
1	Software Improvement and repair: an overview on background and history
2	Bugs, errors, and failures
3	Fault localization
4	AI-assisted fault localization
5	Automated program repair
6	History-driven and AI-assisted automated program repair
7	Benchmarks, evaluation, and reflection
8	Project proposal presentations
9	AI-driven software improvement and repair
10	Fairness and trust
11	In-class final
12	Final project presentations

Lab Details

Lab topic 1: IR-based fault localization
Lab topic 2: Classic automated program repair
Lab topic 3: Learning-based repair with LLMs
Lab topic 4: LLMs for automated software refactoring

Engineering Tools
N/A

Graduate Attributes: This is an elective course, no graduate attributes specified.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)
On Campus Resources Please visit Student services at Concordia University for the services available Gina Cody School students.

SOEN 6131
Automated Program Analysis and Synthesis
Department of Computer Science and Software Engineering
Terms: Fall/Winter

Course Instructor:
Shin Hwei Tan
shinhwei.tan@concordia.ca

Office Hours:
Tuesday– 2.30pm-3.30pm (or by appointment) – S-ER 1121, ER Building, 2155 Guy St.

Tutorials: Please see your class schedule for details
N/A

Labs: Please see your class schedule for details
N/A

Course Calendar Description:
This course introduces key program analysis techniques in automated debugging (e.g., delta debugging and statistical fault localization) and automated program repair (such as genetic improvement, template-based approach). Topics include algorithms of existing debugging techniques, control-flow and data-flow analysis, improving quality of auto-generated code, and test-driven program repair. After learning the basic program analysis techniques, the emerging AI-assisted techniques that use program analysis will be discussed and presented. Students will work in a team for a course project where students will improve existing program analysis tools by fixing bugs listed in the open-source GitHub repositories. A project is required.

Prerequisites: *N/A*
Co-requisites: *N/A*
Undergraduate Anti-requisite: SOEN 473
Crosslisted course: SOEN 473 (Students participating in the graduate course are obliged to undertake a notably more challenging project assignment).

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

The students are required to know basic programming skills in one of the popular programming languages (Java, Python, C, C++) as they will write code to improve tools for the course project.

Course materials
Required Textbook: *N/A*

Grading Scheme
Grades will be based on one in-class presentations, one tool-demo presentation, and a group project involving automated techniques projects. As part of the course project, students will be

expected to produce a final report detailing their techniques and findings. Students participating in the graduate course are obliged to undertake a notably more challenging project assignment.

Deliverable	% of final grade
Assignments	10%
Paper review	15%
Tool Demo	10%
Paper Presentation	10%
Course project	30%
In-class Discussion	10%
Quiz	15%
Total	100%

Tentative Course Schedule

The table below outlines a possible schedule for this course over a 12-week term. Slight modifications to content may occur based on the background and abilities of students. Open-source projects will be used to carry out the course project.

Week(s)	Topics
1	Course Introduction & Research 101
2	Introduction to Program Analysis & Reviewing/Presenting Papers
3	Introduction to Automated Debugging & Automated Program Repair (APR)
4	Introduction to Program Synthesis & Similar Bug Fixes
5	Presentations on Delta Debugging
6	Presentations on Statistical Fault Localization & Program Slicing
7	Progress Report Presentation
8	Presentations on Search-based Program Repair
9	Presentations on Template-based Program Repair
10	Presentations on Semantic-based Program Repair
11	Presentations on AI-based Program Repair
12	Project Presentations

Details on assessment tools: N/A

Other information

Resource Implications: This course has previously been taught as a slot course and therefore has no additional resource implications.

Slot Course Information:

Exclusions: The previous slot course title is SOEN 691 W Software Debugging and Repair

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

- *Learn different techniques of automated debugging, automated program repair and program synthesis*

- *Learn how to conduct systematic literature review for automated debugging and automated program repair*
- *Learn program analysis techniques that form the basis for automated debugging and automated program repair*
- *Evaluate existing techniques for automated debugging and automated program*

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

Please visit Student services at Concordia University for the services available Gina Cody School students.

Graduate Program Regular Curriculum Change - GCS-MIAE-5937 - VERSION : 8

Summary and Rationale for Changes

Background

The M.Eng Aerospace degree is an inter-university program with 3 defining characteristics, defined by an interuniversity agreement. Programs can be implemented by the different universities within those guidelines.

- Students must complete a case study course
- Students must complete 2 courses at a university other than their home university
- **Students must complete a stage or internship of 4-8 months counting for 6-12 credits**.

All partner universities give 6 credits for a 4 month internship. Most other universities give a higher number of credits for an 8 month internship (between 10 and 12 credits). Until now, Concordia has only given 6 credits for 4 month internships. Students completing an 8 month internship were given an extension on their internship course, but the number of credits remain fixed at 6 credits for the entire duration of the internship. Employers are increasingly moving toward a default internship duration of 8 months. International students must maintain a full-time load in every semester (except the summer semester), hence:

- Many students are forced to register to 9 credits of courses during months 5 through 8 of their internship, leading to poor results.
- Students likely target the same program at the other partner universities since they can obtain the same degree for “less work”.
- Students are at a disadvantage when applying for internship.
- Concordia is less competitive with regards to other universities.

Situation to Address

Longer internship durations should be fairly recognized by the number of credits. An added benefit of the proposed change is that the Integrated Pathway students (BEng to Aerospace MEng) can complete the degree within 12-16 months of courses.

Proposed change

- Introduce a new course Engr 7962 (6 credits) to allow students to obtain up to 12 credits for 8 months of internship.
- Modify the M.Eng. Aerospace program structure to reflect that up to 12 credits can be obtained for internships. The number of course credits therefore can vary between 30 and 36 credits.
- Minor edits are also proposed to eliminate references to no longer existing programs; to explicitly state the equivalence of industrial stages and faculty supervised projects; and to accurately reflect current program administration rules.

Resource Implications

None

Graduate Program Regular Curriculum Change - GCS-MIAE-5937 - VERSION : 8

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Mar 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 4 D3). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Program & Development / School of Graduate Studies,
The Graduate Curriculum Committee (GCC), 12 Jan 2026

Approved by:

M. Debbabi, Dean,
Council of the Concordia Institute for Information Systems Engineering, 05 Dec 2025

At its meeting on December 5, 2025, the Council of the Gina Cody School of Engineering and Computer Science has reviewed and approved, as presented, the curriculum changes to the MEng requirements in Aerospace from the Department of Mechanical and Industrial Engineering (MIAE). Namely, the creation of a new internship course ENGR 7962 (4 credits) and an update of the existing internship course ENGR 7961. These proposed changes along with other minor modifications are reflected in the MEng requirements of the Aerospace program.

Motion 2025-07-07 Upon motion duly moved and seconded (B. Vermeire/M. Packirisamy), it was passed that document ECFC 2025.07.05 be ratified as submitted.

Vote: Carried Unanimously

There are no additional resources required.

Details of the curriculum changes are indicated and explained in the dossier GCS-MIAE-5937.

We kindly request that this proposal be placed on the next agenda of the GCC for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: FCC/FAPC/GCS GSC Approval

For Submission to:

M. Debbabi, Dean,
Council of the Gina Cody School of Engineering and Computer Science, 05 Dec 2025

Approved by:

B. Vermeire, Associate Dean,
Graduate Studies Committee of the Gina Cody School of Engineering and Computer Science, 14 Nov 2025

At its meeting on November 14, 2025, the Graduate Studies Committee of the Gina Cody School of Engineering and Computer Science reviewed and approved, as presented, the proposal from the MIAE. Namely, changes to the MEng requirements in Aerospace to reflect adjustments of the 8-month or 10-credits internships to be inline with other partner universities and a full-time registration status.

No additional resources are required.

Details of the curriculum item are indicated and explained in the GCS-MIAE-5937 dossier.

We kindly request that this proposal be placed on the next agenda of the Council of the Gina Cody School of Engineering and Computer Science for approval.

Thank you for your consideration of this proposal.

Summary of Committee Discussion: Department approval

For Submission to:

Dr. B. Vermeire, Associate Dean, Graduate Studies,
2025-26 Graduate Studies Committee (GSC), 14 Nov 2025

Approved by:

Dr. M. Packirisamy, Chair, Department of Mechanical, Industrial & Aerospace Engineering,
Department Council, 24 Oct 2025

The dossier containing these curriculum changes were approved by the Departmental Graduate Studies committee and at the Departmental Council meeting held on Friday, October 24, 2025.

Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ENGR 7961 Industrial Stage and Training Change			✎	✎	✎	✎				
ENGR 7962 Industrial Stage and Training II New	★	★	★	★	★	★	★	★	★	

Program Changes:

	Suspend Admissions	Program Degree Type Change	Program Title Change	Program Require-ments Change	Change to Program Type	Change to Total Credit Value of Program	Change to Primary Campus
Aerospace MEng Change				✎			

Regulation Changes:

- Additional Degree Requirements Change

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Engr 7961 - Changes

Calendar Section Name: Aerospace MEng
Calendar Section Type: Program
Description of Change: Aerospace MEng Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Mechanical, Industrial and Aerospace Engineering
Program Name: Aerospace MEng
Program Type: Course-based
Degree: MEng

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Mechanical, Industrial and Aerospace Engineering Programs > Master/Magisteriate > Aerospace MEng > Degree Requirements

Type of Change: Program Change

	Present Text calendar		Proposed Text
45 credits	Aerospace MEng	**45 credits**	Aerospace MEng
	36 credits of Coursework at the 6000 or 7000 level (2 courses must be taken outside Concordia). The selection of courses must be approved by the Program Director. 12 credits of General/Preparatory Core Courses: ENCS 6021 Engineering Analysis (4) INDU 6351 System Reliability (4) ENGR 6131 Linear Systems (4) ENGR 6201 Fluid Mechanics (4) ENGR 6421 Standards, Regulations and Certification (4) ENGR 6441 Materials Engineering for Aerospace (4) ENGR 6461 Avionic Navigation Systems (4) ENGR 6501 Applied Elasticity (4) ENGR 7181 Digital Control of Dynamic Systems (4) MECH 6451 Computer-Aided Mechanical Design (4) MECH 6481 Aeroelasticity (4) MECH 6791 Aircraft Hydro-Mechanical and Fuel Systems (4) MECH 6891 Aircraft Pneumatic and Electrical Power Systems (4) MECH 6941 Concurrent Engineering in Aerospace Systems (4) ENCS 6141 Probabilistic Methods in Design (4) MECH 7012 Applied Numerical Computing I (1) MECH 7013 Applied Numerical Computing II (1) Any request for change on this requirement must be approved by the program director. Depending on the		30 credits if taking ENGR 7962 or 36 credits of Coursework at the 6000 or 7000 level (2 courses must be taken outside Concordia). The selection of courses must be approved by the Program Director. 12 credits of General/Preparatory Core Courses: ENCS 6021 Engineering Analysis (4) INDU 6351 System Reliability (4) ENGR 6131 Linear Systems (4) ENGR 6201 Fluid Mechanics (4) ENGR 6421 Standards, Regulations and Certification (4) ENGR 6441 Materials Engineering for Aerospace (4) ENGR 6461 Avionic Navigation Systems (4) ENGR 6501 Applied Elasticity (4) ENGR 7181 Digital Control of Dynamic Systems (4) MECH 6451 Computer-Aided Mechanical Design (4) MECH 6481 Aeroelasticity (4) MECH 6791 Aircraft Hydro-Mechanical and Fuel Systems (4) MECH 6891 Aircraft Pneumatic and Electrical Power Systems (4) MECH 6941 Concurrent Engineering in Aerospace Systems (4) ENCS 6141 Probabilistic Methods in Design (4) MECH 7012 Applied Numerical Computing I (1) MECH 7013 Applied Numerical Computing II (1) Any request for change on this requirement must be

D1

Present Text calendar	Proposed Text
background, it may be required for the student to complete certain specified preparatory courses as part of their program.	approved by the program director. Depending on the background, it may be required for the student to complete certain specified preparatory courses as part of their program.
24 credits of Specialization Courses (from one or more areas): Aeronautics and Propulsion Avionics and Control Structures and Materials Space Engineering MECH 7012 Applied Numerical Computing I (1) MECH 7013 Applied Numerical Computing II (1) 3 credits minimum with a maximum of 6 credits chosen from: MECH 6961 Aerospace Case Study I (3) MECH 6971 Aerospace Case Study II (3) 6 credits Industrial Stage: ENGR 7961 Industrial Stage and Training (6)	18 credits if taking ENGR 7962 or 24 credits Specialization Courses (from one or more areas): Aeronautics and Propulsion Avionics and Control Structures and Materials Space Engineering MECH 7012 Applied Numerical Computing I (1) MECH 7013 Applied Numerical Computing II (1) 3 credits minimum with a maximum of 6 credits chosen from: MECH 6961 Aerospace Case Study I (3) MECH 6971 Aerospace Case Study II (3) Or equivalent case study course at a university outside Concordia 6 credits minimum with a maximum of 12 credits of Industrial Stage: ENGR 7961 Industrial Stage and Training I (6) ENGR 7962 Industrial Stage and Training II (6)

Rationale:

Adjusting credit numbers in the programs different categories to reflect that internships may now be worth up to 12 credits instead of only 6 credits.

Clarifying that the case study course can be taken at one of the other universities. This reflects current practice always approved by the Graduate Program Director.

Resource Implications:

None

D2

REGULATIONS CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Engr 7961 - Changes

Calendar Section Name: Additional Degree Requirements
Calendar Section Type: Regulation
Description of Change: Additional Degree Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Mechanical, Industrial and Aerospace Engineering

Calendar publication date: 2026/2027/Fall
Type of change: Regulation Change

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > Gina Cody School of Engineering and Computer Science Programs > Mechanical, Industrial and Aerospace Engineering Programs > Master/Magisteriate > Aerospace MEng

Present Text calendar	Proposed Text
Additional Degree Requirements	Additional Degree Requirements
For other courses available from the participating universities, consult their listings.	For other courses available from the participating universities, consult their listings.
Students must complete a minimum of 45 credits of academic work consisting ~~of:~~ 36 credits of ~~course work in~~ the 6000 or 7000 level (2 courses must be taken outside Concordia), Aerospace Case Study (minimum 3 credits) and an Industrial Stage ~~(6~~ credits). The selection of courses must be approved by the program director. For course prerequisites, refer to the course descriptions.	Students must complete a minimum of 45 credits of academic work consisting of 30 credits if taking ENGR 7962, or 36 credits of coursework at the 6000 or 7000 level (2 courses must be taken outside of Concordia), Aerospace Case Study (minimum 3 credits) and an Industrial Stage (minimum 6 credits). The selection of courses must be approved by the program director. For course prerequisites, refer to the course descriptions.
~~**Note:**~~ Some graduate courses are content equivalent with specified undergraduate courses. These courses are not available for credit to students who have completed the undergraduate equivalent. Refer to the course descriptions for details.	**Note:** Some graduate courses are content equivalent with specified undergraduate courses. These courses are not available for credit to students who have completed the undergraduate equivalent. Refer to the course descriptions for details.
Specialization Courses. Students should consult the program director at their home university for the selection of courses to suit their area of specialization and need not confine their choice to any one area. A minimum of two courses are to be taken outside of Concordia (minimum 3 credits per course), at least one each from any two of the participating universities. Courses must be chosen from the equivalent Master of Aerospace Engineering program of the participating universities. For courses available from the participating universities, consult their listings and request permission for limited enrolment courses. A second Aerospace Case Study course may be considered as a specialization course.	**Specialization Courses.** Students should consult the program director at their home university for the selection of courses to suit their area of specialization and need not confine their choice to any one area. A minimum of two courses are to be taken outside of Concordia (minimum 3 credits per course), at least one each from any two of the participating universities. Courses must be chosen from the equivalent Master of Aerospace Engineering program of the participating universities. For courses available from the participating universities, consult their listings and request permission for limited enrolment courses. A second Aerospace Case Study course may be considered as a specialization course.
Aerospace Case Study. These courses, organized by CIMGAS, are conducted by experts from industry, and are given at one of	**Aerospace Case Study.** These courses, organized by CIMGAS, are conducted by experts from industry, and are given at one of

Present Text calendar	Proposed Text
the participating universities. The material given in a particular case study course might be offered only once. It is, therefore, the responsibility of the student to choose an appropriate course when it is offered. Space in some case study courses may be limited.	the participating universities. The material given in a particular case study course might be offered only once. It is, therefore, the responsibility of the student to choose an appropriate course when it is offered. Space in some case study courses may be limited.
Industrial Stage and Training. There may be some restrictions placed on students chosen for ~~the~~ industry sponsored “stage.” ~~For those students who are unable to obtain~~ an ~~industrial stage, it is possible~~ to ~~take~~ ENGR 7961 ~~for a project carried out at the university. Such students~~ must obtain the approval of the ~~program director.~~	**Industrial Stage and Training.** There may be some restrictions placed on students chosen for an industry sponsored “stage.” The industrial stage and training can be completed either (i) under the supervision of an experienced engineer in the facilities of a participating company or (ii) at Concordia or another university under the supervision of a faculty member. The period of training can range from a minimum of 4 months (ENGR 7961 , 6 credits) to a maximum of 8 months (ENGR 7961 and ENGR 7962 , 12 credits). Students must obtain the approval of the Graduate Program Director prior to the start of the training period.

Rationale:

Adjusting number of credits to reflect the possibility of 8-months 12-credits internship.

Explicitly stating the equivalence of industry sponsored stages and faculty directed projects.

Resource Implications:
None

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Engr 7961 - Changes

Calendar Section Name: ENGR 7961
Calendar Section Type: Course
Description of Change: ENGR 7961 Industrial Stage and Training Change

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Mechanical, Industrial and Aerospace Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Engineering and Computer Science Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
ENGR 7961 Industrial Stage and ~~Training~~ (6 credits)	ENGR 7961 Industrial Stage and Training I (6 credits)
Prerequisites:	*Prerequisites:*
Students must have completed at least ~~twelve credits in the composite option and at least twenty-one~~ credits in the aerospace program. If prerequisites are not satisfied, permission of the program director is required.	Students must have completed at least 18 credits in the aerospace program. If prerequisites are not satisfied, permission of the program director is required.
Description :	*Description :*
This is an integral component of the aerospace program ~~and the composites option in the Mechanical Engineering program~~ that is to be completed under the supervision of an experienced engineer in the facilities of a participating company (Canadian work permit is ~~required).~~ The topic is to be decided by a mutual agreement between the student, the participating company and the program director.	This is an integral component of the aerospace program that is to be completed either (i) under the supervision of an experienced engineer in the facilities of a participating company (Canadian work permit is required) or (ii) at Concordia or another university under the supervision of a faculty member. The topic is to be decided by a mutual agreement between the student, the participating company or supervising faculty member, and the program director.
Component(s):	*Component(s):*
Practicum/Internship/Work Term	Practicum/Internship/Work Term
Notes :	*Notes :*
Non-standard assessment note : The course is graded on the basis of the student's performance during the work period, ~~which includes~~ a technical report. There may be some restrictions placed on students chosen for ~~the industry-sponsored "stage". For those students who are unable to obtain~~ an industrial ~~stage, it~~ is ~~possible to take this course for a project carried out at the university. Such students must obtain the approval of the program director.~~	**Non-standard assessment note :** The course is graded on the basis of the student's performance during the work period, and a detailed technical report. There may be some restrictions placed on students chosen for an industrial sponsored stage. The stage duration is 4 months.

Rationale:

Substantial Course Changes Related to the Introduction of Engr 7962

- Renaming course Engr 7961 to align with the new course Engr 7962.

- Clarifying the nature of the deliverable by calling it a detailed technical report.

Clarification Changes Related to Already Accepted Practice in the Program

- Clarifying the equivalence of faculty supervised projects and industry sponsored stage.
- Changing the number of completed prerequisite credits from 21 to 18. This deviation was already always approved by the GPD on a case by case basis. Allows students to start their stage in their third semester, importantly the first summer semester for Fall entries.

Clerical Changes

- Removing references to no longer existing composite option.

Resource Implications:

None

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: Engr 7961 - Changes

Calendar Section Name: ENGR 7962
Calendar Section Type: Course
Description of Change: ENGR 7962 Industrial Stage and Training II
New

Proposed: Graduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Mechanical, Industrial and Aerospace Engineering

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2026

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > Gina Cody School of Engineering and Computer Science Courses > Engineering Courses > Engineering and Computer Science Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ENGR 7962 Industrial Stage and Training II (6 credits)
Prerequisites:	*Prerequisites:* The following course must be completed in the previous term: ENGR 7961. If there is a break between the two internship terms, approval from the graduate program director is required.
Description :	*Description :* This is an integral component of the aerospace program that is to be completed either (i) under the supervision of an experienced engineer in the facilities of a participating company (Canadian work permit is required) or (ii) at Concordia or another university under the supervision of a faculty member. The topic is to be decided by a mutual agreement between the student, the participating company or supervising faculty member, and the program director.
Component(s):	*Component(s):* Practicum/Internship/Work Term
Notes :	*Notes :*
Other note :	**Other note :** The course is graded on the basis of the student's performance during the work period, and a detailed technical report. There may be some restrictions placed on students chosen for an industry sponsored stage. The stage duration is 4 months.

Rationale:

The creation of Engr 7962 is required to recognize 8-month long internships. Students completing a 4-month internship will be registered to Engr 7961 only. Those students will submit a detailed technical report at the end of their internship. Students completing an 8-month long internship will be registered in Engr 7961 in the first semester of their internship, and Engr 7962 in the second semester of their internship. Those students will submit a detailed technical report at the mid-point of their internship. They will also submit, at the end of their internship, a work experience report, highlighting their further professional development in the second half of the internship. Students undertaking an internship are not judged on the completeness or correctness of the technical work undertaken. They are judged on the appropriateness of the technical work for a professional aerospace engineer. It is therefore appropriate to have students submit a detailed technical report at the end or mid-point of their internship.

Other course arrangement options were not appropriate.

- The already existing course Encs 6921 is coded as part-time and is worth only 4 credits. Since M.Eng. Aerospace internships are expected to be full-time work/project a higher credit count (6 credits) is preferred.
- The option of creating a two semester 12 credit course would have removed flexibility from the program. Specifically, the possibility for students to complete two separate four month internships. Also, students who initially start a four month internship that is extended during their tenure would have needed to be de-registered from Engr 7961 and subsequently re-registered to the two semester course.

Resource Implications:

None

Impact Report

Programs

Aerospace MEng
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Aerospace MEng -> Degree Requirements
Source of Impact

- ENGR 7961

Defined Groups

E11 - Aeronautics and Astronautics
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> List of Engineering Courses by Topic Areas
Source of Impact

- ENGR 7961

Courses

ENGR 7962 Industrial Stage and Training II New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> Gina Cody School of Engineering and Computer Science Courses -> Engineering Courses -> Engineering and Computer Science Courses
Source of Impact

Regulations

Additional Degree Requirements
Graduate -> See Summer 2026 Graduate Calendar -> Programs -> Gina Cody School of Engineering and Computer Science Programs -> Mechanical, Industrial and Aerospace Engineering Programs -> Master/Magisteriate -> Aerospace MEng
Source of Impact

- ENGR 7961

Other Units

Addition of **ENGR 7962** to **Aerospace MEng** requirement
Source of other unit Impact

- Course is housed in Engineering Courses

Addition of **ENGR 7962** to **Additional Degree Requirements** requirement
Source of other unit Impact

- Course is housed in Engineering Courses

Course Number	Course Title	Term	Academic Year
ENGR 7961	**Industrial Stage and Training I**	**Fall/ Winter/ Summer**	**2026**

Instructor	Office	Email	Office Hours
Charles Basenga Kiyanda MENG Aero Graduate Program Director	EV4.139 (Leslie Hosein)	Contact the program coordinator, Leslie Hosein leslie.hosein@concordia.ca for initial questions.	By appointment

CLASS, LAB AND TUTORIAL SCHEDULE					
Section	**Day**	**Time**	**Location**	**Instructor**	**E-mail**
Not applicable					

COURSE CALENDAR DESCRIPTION
This is an integral component of the aerospace program that is to be completed either (i) under the supervision of an experienced engineer in the facilities of a participating company (Canadian work permit is required) or (ii) at Concordia or another university under the supervision of a faculty member. The topic is to be decided by a mutual agreement between the student, the participating company or supervising faculty member, and the program director. Component(s): Practicum/Internship/Work Term

PREREQUISITE
Students must have completed at least 18 credits in the aerospace program. If prerequisites are not satisfied, permission of the program director is required.
THIS COURSE IS A PREREQUISITE TO
none
TEXTBOOK AND ADDITIONAL COURSE MATERIALS
none

KNOWLEDGE BASE FOR ENGINEERING PREREQUISITES
Not applicable

GRADING POLICY

The course is graded on the basis of the student's performance during the work period, and a detailed technical report.

At the conclusion of the stage/training, the student will submit:

- A detailed technical report (typically 30-40 pages)
- A completed supervisor evaluation form

The general description of the report and the individual rubrics for grade assessment are detailed below.

COURSE ELEMENTS AND GRADING RUBRICS

The final grade will follow the letter grade standard detailed in the graduate calendar.

Description of report:
The detailed technical report, typically of a length of 30-40 pages, should contain the following information:

- a summary of the company/research unit, its overall history, the field of work and how it relates to aerospace engineering;
- a description of the work environment and main work processes;
- a description of the work activities you performed and, if needed, why the work activities differ from the initial stage description in the abstract;
- examples of the different work activities you performed (if company policy prohibits dissemination of technical information, replace examples of work performed by generic examples);
- a description of how the stage has contributed to your professional development
- .

The report should follow a professional format typically used for engineering/scientific publication. The GSC style guide can be followed. The report should have, minimally, an abstract, a table of contents, a list of tables, a list of figures, a list of variables/nomenclature, and a reference section. The text of the report should be divided into chapters/section, subsections as appropriate for the format.

The report can be delivered on paper or electronically in a file format meant for archiving. Typical file format used is PDF as it is meant for presentation and archival of information, and not for continuous editing. Reports submitted in a text editor format (doc, docx, ppt presentations, etc) will receive a lower grade.

Rubric	Report Format	Report Content	Supervisor Evaluation
A+	Format is professional and conforms to norms of engineering/scientific	Report contains all required components.	Student reported to work diligently, took part in activities of the wider group. Student took charge of their

	publishing in the field.	Report is well-structured, easy to follow, and instructive to the reader.	own activities. Student assumed responsibilities beyond their initially assigned work activities. Employer has extended or is considering extending an employment offer to student.
A	Format is professional and conforms to most norms of engineering/scientific publishing in the field.	Report contains all required components. Report is well-structured and easy to follow.	Student reported to work diligently, took part in activities of the wider group. Student took charge of their own activities. Employer is considering extending an employment offer to student.
A-	Format is professional and conforms to most norms of engineering/scientific publishing in the field. Some inconsistencies.	Report contains all required components. Report is well-structured and easy to follow, though some slight restructuring could improve readability.	Student reported to work diligently, took part in activities of the wider group. Student took charge of their own activities. Employer is considering extending an employment offer to student.
B+	Format follows most university guidelines. Few to no inconsistencies.	Most of the required information is contained in the report. Structure could be improved for readability.	Student was diligent in reporting to place of work. Work activities were undertaken. Student required some supervision to start work activities.
B	Format generally follows university guidelines with some errors or inconsistencies.	Most of the required information is contained in the report. Structure could be improved for readability and comprehension.	Student was diligent in reporting to place of work. Work activities were undertaken. Student required constant supervision to start work activities.
B-	Format follows the	Most of the	Student was diligent in reporting to

	general university guidelines with errors. Lack of professionalism (did not convert to an archival format, e.g. PDF)	required information is contained in the report. Report structure makes it hard to follow the work activities performed.	place of work. Work activities were undertaken. Student required constant supervision to start and complete work activities.
C	Format is somewhat consistent but unprofessional.	Report lacks significant information and is too succinct to give a clear understanding of the work activities performed.	Student did not assiduously attend place of work. Work activities were not undertaken.
F	No consistent format is followed.	Minimum required information not included in the report or no report submitted.	Student made no effort to engage in activities or be present at place of work

COURSE LEARNING OUTCOMES	
Statement	**Graduate Attribute**
The student adopts a professional attitude in the workplace.	Not applicable
The student uses prior learning to develop the skills and find the knowledge required by their work activities.	
The student takes ownership of their work activities. They: initiate work activities autonomously; seek guidance, opinions and ideas when required.	
The student can generate new ideas, suggest modifications to or new work activities when required.	
The student can present the output of work activities in a professional manner.	

IMPORTANT DATES (These dates do not address specific Coop Institute Requirements)	
Prior to registration	**Submit an approximately 1-page abstract containing the following elements to Leslie Hosein, leslie.hosein@concordia.ca** 1. Start and end date of internship 2. Name and coordinates of proposed supervisor and Company or University 3. Location of internship (if distinct from proposed supervisor's) 4. Summary of tasks expected to be completed in the course of the stage or internship 5. If the duration of the internship is 6 months or greater: a justification for the longer duration of the internship. What will be learned over the duration of the internship that could not be achieved in a 4-month internship and which warrants registration to both ENGR 7961 and ENGR 7962.
Prior to DNE	1. Confirm (normally by email) approval of abstract by the Program Director 2. Confirm registration to ENGR 7961 (registration will be done by the Program Coordinator) 3. **If required**, sign the Internship Agreement (Convention de Stage) and confirm that the required parties have all signed: Student, Program Director, GCS Dean (or designate), Company Representative (Industrial Stage) or University Faculty (Research Internship)
End of term	**Submit**: • detailed technical report • supervisor evaluation form

ROLES AND RESPONSIBILITIES (note: if an internship agreement or convention de stage exists, that document takes precedence over the following description)	
Student	It is the ultimate responsibility of the student to find an internship placement. Different tools can be used to meet this goal. • If the student is part of the Coop institute program, the COMPAS database can be used, subject to the requirements of the Coop Institute • The Concordia CAPS job bank can be used • Job fairs, at Concordia or elsewhere • Opportunities disseminated through the Meng Aero mailing list • Placement Spot, linkedin, employer websites, etc **An appropriate stage/internship must have the following**

	characteristics: • **Four month duration at normal working hours, or an equivalent of 600 hours, minimum; Internships of 6-8 months duration (900-1200 hours) will cover both ENGR 7961 and ENGR 7962.** • **Paid or unpaid position;** • **Equivalent engineering-level position requiring an undergraduate degree;** The student is responsible for ensuring the detailed technical report follows all guidelines of the company/research unit where the stage took place and whether it can be disseminated privately or publicly.
Training/Stage Supervisor	The student will be trained by the supervisor or appropriate designee(s). The work performed by the student will be reviewed by the supervisor or appropriate designee(s). The supervisor should meet regularly with the student to assess their progression through the stage, offer feedback on their performance and avenues for improvement.
Program Director	Duties are to: • Approve the stage content, location, supervisor and proposed work activities. • Evaluate the detailed technical report, review the supervisor evaluation form and assign the final grade for the stage.

DISCLAIMER
Registration into the Coop institute program is not required to complete this stage. If the student is part of the coop institute program, they must communicate and coordinate with the Coop institute to meet coop institute deadlines. The deliverables of ENGR 7961 are distinct from Coop institute deliverables.

Examination Details
There are no formal examinations in this course.

ON CAMPUS RESOURCES

HEALTH SERVICES An on-campus health clinic and health promotion center with nurses and doctors. SGW 514-848-2424 ext. 3565 LOY 514-848-2424 ext. 3575	COUNSELLING AND PSYCHOLOGICAL SERVICES Counsellors (licensed mental health professionals) work with students to address their mental health and wellbeing needs. SGW 514-848-2424 ext. 3545 LOY 514-848-2424 ext. 3555
ACCESS CENTRE FOR STUDENTS WITH DISABILITIES Supports students with a variety of disability conditions (including temporary disabilities arising from illness or injury). Students receive academic support for their educational experience at Concordia. acsdinfo@concordia.ca 514-848-2424 ext. 3525	SEXUAL ASSAULT RESOURCE CENTRE Provides confidential and non-judgemental support and services to students, staff and faculty of all genders and orientations affected by sexual violence and/or harassment. Jennifer Drummond, Coordinator jennifer.drummond@concordia.ca sarc@concordia.ca 514-848-2424 ext. 3353
STUDENT SUCCESS CENTRE Support network from first-year to graduation. You'll find one-on-one tutors, study groups, workshops as well as learning and career advisors 514-848-2424 ext. 3921	DEAN OF STUDENTS Supports students to enhance their Concordia experience by engaging in student life outside the classroom Terry Kyle, Manager deanofstudents.office@concordia.ca SGW 514-848-2424 ext. 3517 LOY 514-848-2424 ext. 4239
ABORIGINAL STUDENT RESOURCE CENTRE An on-campus resource for First Nations, Métis and Inuit students that helps them make the most of the many resources available at the University. Orenda Konwawennotion Boucher-Curotte, Coordinator orenda.boucher@concordia.ca 514-848-2424 ext. 7327	INTERNATIONAL STUDENTS OFFICE Supporting international students with immigration documents, health insurance, social events, and workshops. iso@concordia.ca 514-848-2424 ext. 3515
STUDENT ADVOCACY OFFICE Advocating for students facing charges under the Academic Code of Conduct or the Code of Rights and Responsibilities. studentadvocates@concordia.ca 514-884-2424 ext. 3992	MULTI-FAITH & SPIRITUALITY CENTRE Provides a home for all those wishing to celebrate the human spirit in the widest sense of the word, through programs, events and a quiet space for reflection. Ellie Hummel, Coordinator mfsc@concordia.ca 514-848-2424 ext. 3593
CAMPUS SECURITY Ensures the safety of our members and campus property through prevention, surveillance, intervention, training, and education. Provides emergency medical services. security@concordia.ca 514-848-3717 (dial 1 for urgent situations; dial 2 for non-urgent situations)	**CONCORDIA UNIVERSITY STUDENT PARENTS CENTRE** An accessible space for student parents to study, share interests and develop a support network. Sumaiya Gangat, Coordinator cusp@concordia.ca 514-848-2424 ext. 2431

ACADEMIC HONESTY AND CODE OF CONDUCT

Violation of the academic Code of Conduct in any form will be severely dealth with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work. The Academic Code of Conoduct of Concordia University is available at:
http://www.concordia.ca/students/academic-integrity/offences.html

It is expected that during class discussions and in your written assignments you will communicate constructively and respectfully. Sexist, racist, homophobic, ageist, and ableist expressions will not be tolerated.

ADDENDUM

ACADEMIC CONDUCT ISSUES THAT APPLY IN GENERAL
The basic ten rules that make you a good engineer

The B. Eng. program is set to satisfy most of the requirements for your education and prepares you for a professional engineering career that requires dedication and knowledge. What you learn, and how you learn, will be used extensively in your engineering profession for the next 30 to 40 years. Therefore, the four years spent in the engineering program are crucial towards your professional formation. The first step is for you to learn to “think like an engineer” which means:

- accept responsibility for your own learning
- follow up on lecture material and homework
- learn *problem-solving skills,* not just how to solve each specific homework problem
- build a body of knowledge integrated throughout your program
- behave responsibly, ethically and professionally

One of the mainstays of being a professional engineer is a professional code of conduct and as an engineering student this starts with the Academic Code of Conduct (Article 16.3.14 of the undergraduate calendar). However, you may encounter situations that fall outside the norm and in such cases, you use your common sense.

Further, the following issues should be given serious consideration:

1) Attendance at lectures and tutorials are major learning opportunities and should not be missed. The labs represent a unique opportunity for you to acquire practical knowledge that you will need in your career. Class and tutorial attendance is important for you to comprehend the discipline and make the connections between engineering skills. You are strongly encouraged to participate in the class, ask questions and answer the instructor’s questions. Tutorials are just extensions of the classes in which application of the concepts presented during the lectures are presented and problems are practically solved.

2) The decision to write tests that are not mandatory is entirely yours. For example, midterm test are often stated in many courses as optional. However, one the objectives of midterms is to check on your comprehension of the material and allow time for whatever action is necessary (from more study time to discontinuing a course). Plan to attend the class tests even if they are not mandatory. If you pay attention in the lectures, it will take you significantly shorter time to comprehend the material. **Note also** that if you are in the unfortunate position of being unable to write a final exam due to medical reasons and seek a deferral, this may not be possible if the instructor has no information indicating that you have been attending the course and assimilating the material (ie through midterms, quizzes, assignments etc).

3) Homework is usually mandatory and it has some weight in the final grade (such information is given in the course outline). Homework may also be conceived as training material for the class tests. Under all circumstances, it is highly recommended to carry out the home work on time and submit it on the prescribed date. Late submissions are not granted to individual cases regardless of the reason. This is part of the training for being in the workforce where deadlines have to be met. Please, plan your work such that you submit all the assignments and lab reports on time and in the correct place (not in the corridor or on the street!).

4) Office hours with tutors, lab instructors or class instructors are listed in the course outline/website/office doors. Please respect these office hours and in case you have a serious conflict, contact the instructor asking for a special time arrangement.

5) Class tests (midterms, quizzes) are returned to the student. The final exams are not. If you wish to see your exam paper, be aware that most instructors allow only a narrow window of time for that purpose. For the fall term, exams may usually be reviewed in January and May for the spring term.

6) When you see your marked work (assignments, midterms, final exam etc), be aware that you are supposed to review your material and see the type of errors you made and if marks have been added incorrectly. This is not an opportunity to try and “negotiate” a higher grade with the instructor. If you believe that your grade is not right, you may apply for a formal Course Reevaluation through the Birks Student Centre.

7) Writing tests and exams represents a major component of your course work. These tests and exams have rigorous requirements such as:

- **No cell phone or other communication enabling tool is allowed on the student** during the examination period.
- Only **specified faculty calculators** are allowed during tests and exams unless otherwise indicated by the instructor.
- Usually, **no materials** are allowed in the exam unless otherwise announced.

Get used to signing in and out of your exam. Make sure that you leave your exam papers with the invigilator. There are rules concerning general exam issues in the UG Calendar. These requirements are there to eliminate any possible misunderstanding and you are asked to **respect the rules**. Disciplinary measures are taken when the rules are not followed.

8) Respect your colleagues and those that you meet during the class: tutors, instructors, lab instructors, technical personnel, assistants, etc. Use appropriate communication means and language. Be considerate for all human beings. This includes small things such as turning off cell-phones before a class begins. Concordia University is a very diverse group of people and a very large multicultural community.

9) Communication is part of your future profession. Learn how to communicate effectively and efficiently in the shortest time possible. Write short but meaningful e-mails, make effective phone calls, etc. If your instructor accepts emails make sure that your request is clear with the course number and your name in the *Subject* line. Do not ask for special treatment as instructors have to treat all students equitably.

10) Respect all the above and you will get closer to your future profession.

Course Number	Course Title	Term	Academic Year
ENGR 7962	**Industrial Stage and Training II**	**Fall/ Winter/ Summer**	**2026**

Instructor	Office	Email	Office Hours
Charles Basenga Kiyanda MENG Aero Graduate Program Director	EV4.139 (Leslie Hosein)	Contact the program coordinator, Leslie Hosein leslie.hosein@concordia.ca for initial questions.	By appointment

CLASS, LAB AND TUTORIAL SCHEDULE					
Section	**Day**	**Time**	**Location**	**Instructor**	**E-mail**
Not applicable					

COURSE CALENDAR DESCRIPTION

This is an integral component of the aerospace program that is to be completed either (i) under the supervision of an experienced engineer in the facilities of a participating company (Canadian work permit is required) or (ii) at Concordia or another university under the supervision of a faculty member. The topic is to be decided by a mutual agreement between the student, the participating company or supervising faculty member, and the program director.

Component(s): Practicum/Internship/Work Term

PREREQUISITE

The following course must be completed in the previous term: ENGR 7961. If there is a break between the two internship terms, approval from the graduate program director is required.

THIS COURSE IS A PREREQUISITE TO

none

TEXTBOOK AND ADDITIONAL COURSE MATERIALS

none

KNOWLEDGE BASE FOR ENGINEERING PREREQUISITES

Not applicable

GRADING POLICY

The course is graded on the basis of the student's performance during the work period, and a detailed technical report.

At the conclusion of the stage/training, the student will submit:

- A detailed technical report
- A completed supervisor evaluation form

The general description of the report and the individual rubrics for grade assessment are detailed below.

COURSE ELEMENTS AND GRADING RUBRICS

The final grade will follow the letter grade standard detailed in the graduate calendar.

Description of report:

If you are completing the 2nd half of an 8 month internship, the technical report should contain the following information:

- a short summary, consistent with your eNGR 7961 report, of the company/research unit, history, the field, your work environment;
- a description of the new work activities and/or the further responsibilities you were able to undertake in the 2nd part of the stage;
- examples of the new work activities undertaken in the 2nd part of the stage;
- a description of how the 2nd part of the stage has contributed to your professional development.

If you are undertaking a different, 4-month nominal duration, stage, the detailed technical report, typically of a length of 30-40 pages, should be similar to the ENGR 7961 report and contain the following information:

- a summary of the company/research unit, its overall history, the field of work and how it relates to aerospace engineering;
- a description of the work environment and main work processes;
- a description of the work activities you performed and, if needed, why the work activities differ from the initial stage description in the abstract;
- examples of the different work activities you performed (if company policy prohibits dissemination of technical information, replace examples of work performed by generic examples);
- a description of how the stage has contributed to your professional development.

The report should follow a professional format typically used for engineering/scientific publication. The GCS style guide can be followed. The report should have, minimally, an abstract, a table of contents, a list of tables, a list of figures, a list of variables/nomenclature, and a reference section. The text of the report should be divided into chapters/section, subsections as appropriate for the format.

The report can be delivered on paper or electronically in a file format meant for archiving. Typical file format used is PDF as it is meant for presentation and archival of information, and not for continuous editing. Reports submitted in a text editor format (doc, docx, ppt presentations, etc) will receive a lower grade.

Rubric	Report Format	Report Content	Supervisor Evaluation
A+	Format is professional and conforms to norms of engineering/scientific publishing in the field.	Report contains all required components. Report is well-structured, easy to follow, and instructive to the reader.	Student reported to work diligently, took part in activities of the wider group. Student took charge of their own activities. Student assumed responsibilities beyond their initially assigned work activities. Employer has extended or is considering extending an employment offer to student.
A	Format is professional and conforms to most norms of engineering/scientific publishing in the field.	Report contains all required components. Report is well-structured and easy to follow.	Student reported to work diligently, took part in activities of the wider group. Student took charge of their own activities. Employer is considering extending an employment offer to student.
A-	Format is professional and conforms to most norms of engineering/scientific publishing in the field. Some inconsistencies.	Report contains all required components. Report is well-structured and easy to follow, though some slight restructuring could improve readability.	Student reported to work diligently, took part in activities of the wider group. Student took charge of their own activities. Employer is considering extending an employment offer to student.
B+	Format follows most university guidelines. Few to no inconsistencies.	Most of the required information is contained in the report. Structure could be improved for readability.	Student was diligent in reporting to place of work. Work activities were undertaken. Student required some supervision to start work activities.
B	Format generally follows	Most of the	Student was diligent in reporting to

	university guidelines with some errors or inconsistencies.	required information is contained in the report. Structure could be improved for readability and comprehension.	place of work. Work activities were undertaken. Student required constant supervision to start work activities.
B-	Format follows the general university guidelines with errors. Lack of professionalism (did not convert to an archival format, e.g. PDF)	Most of the required information is contained in the report. Report structure makes it hard to follow the work activities performed.	Student was diligent in reporting to place of work. Work activities were undertaken. Student required constant supervision to start and complete work activities.
C	Format is somewhat consistent but unprofessional.	Report lacks significant information and is too succinct to give a clear understanding of the work activities performed.	Student did not assiduously attend place of work. Work activities were not undertaken.
F	No consistent format is followed.	Minimum required information not included in the report or no report submitted.	Student made no effort to engage in activities or be present at place of work

COURSE LEARNING OUTCOMES	
Statement	**Graduate Attribute**
The student adopts a professional attitude in the workplace.	Not applicable
The student uses prior learning to develop the skills and find the knowledge required by their work activities.	
The student takes ownership of their work activities. They: initiate work activities autonomously; seek guidance, opinions and ideas when required.	
The student can generate new ideas, suggest modifications to or	

new work activities when required.	
The student can present the output of work activities in a professional manner.	

IMPORTANT DATES (These dates do not address specific Coop Institute Requirements)	
Prior to registration	**If you were placed in an 8-month internship when registering to ENGR 7961,** there are no actions to take. You should already be registered to ENGR 7962. **If your initial, 4-month internship is extended to 8-months,** you must submit an approximately 1-page abstract containing the following elements to Leslie Hosein, leslie.hosein@concordia.ca 1. Start and end date of internship extension 2. Name and coordinates of proposed supervisor and Company or university (if different from initial internship description) 3. Location of internship (if different from initial internship description) 4. Summary of new or modified tasks expected to be completed in the new internship and *how the extension is expected to further your professional development.* **If you are undertaking a new, 4-month internship, distinct from the stage completed in ENGR 7961.** Submit an approximately 1-page abstract containing the following elements to Leslie Hosein, leslie.hosein@concordia.ca 1. Start and end date of internship 2. Name and coordinates of proposed supervisor and Company or University 3. Location of internship (if distinct from proposed supervisor's) 4. Summary of tasks expected to be completed in the course of the stage or internship 5. *A description of how this 2nd stage will further your professional development beyond what was learned in the 1st stage.*
Prior to DNE	1. Confirm (normally by email) approval of abstract by the Program Director 2. Confirm registration to ENGR 7962 (registration will be done by the Program Coordinator) 3. **If required**, sign the Internship Agreement (Convention de Stage) and confirm that the required parties have all signed: Student, Program Director, GCS Dean (or designate), Company Representative (Industrial Stage) or University Faculty (Research Internship)
End of term	**Submit**: • detailed technical report • supervisor evaluation form

ROLES AND RESPONSIBILITIES (note: if an internship agreement or convention de stage exists, that document takes

precedence over the following description)	
Student	It is the ultimate responsibility of the student to find an internship placement. Different tools can be used to meet this goal. • If the student is part of the Coop institute program, the COMPAS database can be used, subject to the requirements of the Coop Institute • The Concordia CAPS job bank can be used • Job fairs, at Concordia or elsewhere • Opportunities disseminated through the Meng Aero mailing list • Placement Spot, linkedin, employer websites, etc **An appropriate stage/internship must have the following characteristics:** • **Four month duration at normal working hours, or an equivalent of 600 hours, minimum or be the continuation of a 6-8 months internship;** • **Paid or unpaid position;** • **Equivalent engineering-level position requiring an undergraduate degree;** The student is responsible for ensuring the detailed technical report follows all guidelines of the company/research unit where the stage took place and whether it can be disseminated privately or publicly.
Training/Stage Supervisor	The student will be trained by the supervisor or appropriate designee(s). The work performed by the student will be reviewed by the supervisor or appropriate designee(s). The supervisor should meet regularly with the student to assess their progression through the stage, offer feedback on their performance and avenues for improvement.
Program Director	Duties are to: • Approve the stage content, location, supervisor and proposed work activities. • Evaluate the detailed technical report, review the supervisor evaluation form and assign the final grade for the stage.

DISCLAIMER
Registration into the Coop institute program is not required to complete this stage. If the student is part of the coop institute program, they must communicate and coordinate with the Coop institute to meet coop institute deadlines. The deliverables of ENGR 7961 are distinct from Coop institute deliverables.

Examination Details
There are no formal examinations in this course.

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ABORIGINAL STUDENT RESOURCE CENTRE An on-campus resource for First Nations, Métis and Inuit students that helps them make the most of the many resources available at the University. Orenda Konwawennotion Boucher-Curotte, Coordinator orenda.boucher@concordia.ca 514-848-2424 ext. 7327	INTERNATIONAL STUDENTS OFFICE Supporting international students with immigration documents, health insurance, social events, and workshops. iso@concordia.ca 514-848-2424 ext. 3515
STUDENT ADVOCACY OFFICE Advocating for students facing charges under the Academic Code of Conduct or the Code of Rights and Responsibilities. studentadvocates@concordia.ca 514-884-2424 ext. 3992	MULTI-FAITH & SPIRITUALITY CENTRE Provides a home for all those wishing to celebrate the human spirit in the widest sense of the word, through programs, events and a quiet space for reflection. Ellie Hummel, Coordinator mfsc@concordia.ca 514-848-2424 ext. 3593
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ADDENDUM

ACADEMIC CONDUCT ISSUES THAT APPLY IN GENERAL
The basic ten rules that make you a good engineer

The B. Eng. program is set to satisfy most of the requirements for your education and prepares you for a professional engineering career that requires dedication and knowledge. What you learn, and how you learn, will be used extensively in your engineering profession for the next 30 to 40 years. Therefore, the four years spent in the engineering program are crucial towards your professional formation. The first step is for you to learn to “think like an engineer” which means:

- accept responsibility for your own learning
- follow up on lecture material and homework
- learn *problem-solving skills,* not just how to solve each specific homework problem
- build a body of knowledge integrated throughout your program
- behave responsibly, ethically and professionally

One of the mainstays of being a professional engineer is a professional code of conduct and as an engineering student this starts with the Academic Code of Conduct (Article 16.3.14 of the undergraduate calendar). However, you may encounter situations that fall outside the norm and in such cases, you use your common sense.

Further, the following issues should be given serious consideration:

1) Attendance at lectures and tutorials are major learning opportunities and should not be missed. The labs represent a unique opportunity for you to acquire practical knowledge that you will need in your career. Class and tutorial attendance is important for you to comprehend the discipline and make the connections between engineering skills. You are strongly encouraged to participate in the class, ask questions and answer the instructor’s questions. Tutorials are just extensions of the classes in which application of the concepts presented during the lectures are presented and problems are practically solved.

2) The decision to write tests that are not mandatory is entirely yours. For example, midterm test are often stated in many courses as optional. However, one the objectives of midterms is to check on your comprehension of the material and allow time for whatever action is necessary (from more study time to discontinuing a course). Plan to attend the class tests even if they are not mandatory. If you pay attention in the lectures, it will take you significantly shorter time to comprehend the material. **Note also** that if you are in the unfortunate position of being unable to write a final exam due to medical reasons and seek a deferral, this may not be possible if the instructor has no information indicating that you have been attending the course and assimilating the material (ie through midterms, quizzes, assignments etc).

3) Homework is usually mandatory and it has some weight in the final grade (such information is given in the course outline). Homework may also be conceived as training material for the class tests. Under all circumstances, it is highly recommended to carry out the home work on time and submit it on the prescribed date. Late submissions are not granted to individual cases regardless of the reason. This is part of the training for being in the workforce where deadlines have to be met. Please, plan your work such that you submit all the assignments and lab reports on time and in the correct place (not in the corridor or on the street!).

4) Office hours with tutors, lab instructors or class instructors are listed in the course outline/website/office doors. Please respect these office hours and in case you have a serious conflict, contact the instructor asking for a special time arrangement.

5) Class tests (midterms, quizzes) are returned to the student. The final exams are not. If you wish to see your exam paper, be aware that most instructors allow only a narrow window of time for that purpose. For the fall term, exams may usually be reviewed in January and May for the spring term.

6) When you see your marked work (assignments, midterms, final exam etc), be aware that you are supposed to review your material and see the type of errors you made and if marks have been added incorrectly. This is not an opportunity to try and “negotiate” a higher grade with the instructor. If you believe that your grade is not right, you may apply for a formal Course Reevaluation through the Birks Student Centre.

7) Writing tests and exams represents a major component of your course work. These tests and exams have rigorous requirements such as:

- **No cell phone or other communication enabling tool is allowed on the student** during the examination period.
- Only **specified faculty calculators** are allowed during tests and exams unless otherwise indicated by the instructor.
- Usually, **no materials** are allowed in the exam unless otherwise announced.

Get used to signing in and out of your exam. Make sure that you leave your exam papers with the invigilator. There are rules concerning general exam issues in the UG Calendar. These requirements are there to eliminate any possible misunderstanding and you are asked to **respect the rules**. Disciplinary measures are taken when the rules are not followed.

8) Respect your colleagues and those that you meet during the class: tutors, instructors, lab instructors, technical personnel, assistants, etc. Use appropriate communication means and language. Be considerate for all human beings. This includes small things such as turning off cell-phones before a class begins. Concordia University is a very diverse group of people and a very large multicultural community.

9) Communication is part of your future profession. Learn how to communicate effectively and efficiently in the shortest time possible. Write short but meaningful e-mails, make effective phone calls, etc. If your instructor accepts emails make sure that your request is clear with the course number and your name in the *Subject* line. Do not ask for special treatment as instructors have to treat all students equitably.

10) Respect all the above and you will get closer to your future profession.

Academic Planning and Programs Committee (APPC)

Departmental Consultations Summary

Emerging insights reviewed by the APPC

Prepared by:

Office of the Provost and Vice-President, Academic

Faye Diamantoudi - I/Provost and Vice-President, Academic
Paul Fournier - Director, Strategic Transformation Services
Corey Hoare - Senior Analyst, Strategic Enrolment Management
Donald Lafrance - Senior Director, Strategic Enrolment Management

Date:

March 2026

Context and purpose of the report

This report consolidates the insights gathered through departmental enrolment discussions conducted across all faculties from November 2025 to February 2026. Its purpose is to provide APPC with an overview of the opportunities, challenges, and themes emerging from academic departments. These findings were reviewed by the APPC and informed the identification and refinement of institutional academic priorities.

What was heard across departments

The enrolment discussions revealed several common themes that speak directly to Concordia's current academic environment, opportunities for growth, and areas where strategic direction is required. The points below summarize the recurring high level and salient points the academic units brought forward.

1. Short programs and flexible pathways

Departments expressed strong interest in developing microprograms and stackable certificates using existing courses (without budget impact). Many departments view this as the fastest path to reaching new learner segments, attracting mature, professional and/or part-time learners, and diversifying the enrolment pool.

There is also a growing recognition that the current prospective student pool for traditional learners is limited. As a result, departments see a need to adapt to new learner groups through shorter, more flexible programs. This includes the ability to offer credits through Recognition of Prior Learning (RPL).

Certain academic departments noted the need to establish blanket TEC-DEC agreements, rather than institution-specific ones, to strengthen the CEGEP pathway. Doing so would likely draw in new prospective students and allow departments to remain competitive within the local education landscape

2. Online delivery

Multiple departments across faculties are ready to pilot remote synchronous learning to attract new learners and help alleviate on-campus classroom capacity constraints. Given that students pursue full programs rather than individual courses, academic units are aware that simply having a few online courses will not encourage applications from new learner segments. Rather, they are considering the possibility of developing fully online programs.

This will require a clear institutional online strategy, coherent standards, and having a secure platform for online assessments.

3. Capacity constraints

Academic units raised a variety of capacity-related concerns which expanded beyond physical or space capacities for classrooms, labs, studios, and other student spaces. Many academic units expressed concern around the hiring freeze for faculty positions. Notably, most faculty retirements are not being replaced which often strains teaching and supervision capacity. Several academic units mentioned that graduate enrolment will not grow unless more tenure-track faculty are hired.

Similarly, a reduction in the allocation of course sections (done at the faculty-level) also appear to strain their capacity to grow enrolment in undergraduate programs.

4. Defining distinct learner segments

Most departments noted that their programs are designed primarily for the traditional full-time, daytime student, even though many programs now serve a much more diverse group of learners. Several reported that their classrooms often include a mix of full-time and part-time students, working professionals, mature learners, and even senior learners, yet the structure and delivery of the program continue to reflect the traditional learner profile.

A handful of programs are geared towards more working professional (and consequently part-time) learner segments though this is not adequately reflected on the program webpages nor the recruitment communications. Simply, working professional learner segments cannot easily identify which programs correspond to their needs or schedules

Despite strong interest in reaching new learner segments (i.e., working professionals, evening/weekend learners, and both remote domestic and international learners), academic units noted the substantial work needed to attract these segments. Specifically, the need to update or refresh program structures, make changes to the scheduling of course or learning activities, and to re-orient student recruitment efforts would all need to occur. They expressed the need for clearer institutional guidance on which learner audiences Concordia aims to prioritize, and how programs should adapt to meet their needs.

5. Market intelligence

Academic units frequently mentioned the need for support with comparator benchmarking and market demand assessment for new programs. This is particularly relevant for shorter programs (e.g., microprograms), which are intended to respond to clearly identified learning and skills gaps. Academic units noted that developing informed enrolment projections and identifying realistic market opportunities for new offerings remains challenging.

6. Student experience and retention

Concerns about student retention emerged across the enrolment discussions. Academic units noted various challenges spanning course availability constraints (especially for required courses) and various bottlenecks (i.e., specific pre- or co-requisite courses, administrative processes, information communication and availability of advising appointments). An emerging theme was also the prevalence of student mental health concerns which intensified following the COVID pandemic.

Many departments expressed interest in supporting outreach to active students who remain unregistered but indicated that more accurate data and clearer information are needed to do so effectively. There is a shared understanding that more flexible program options, combined with recognition of prior learning (RPL), will be essential to re-engaging students who have been away from Concordia for several years and who may require alternative pathways to return and complete their studies.

7. Information sharing and support

Across most enrolment discussions, academic units described challenges related not only to internal processes but also to the information and services that support enrolment planning and academic development. They often mentioned slow response times or delays in service when requesting updates to their website, the communication of admissions decisions, and being granted access to student and/or enrolment data, all of which, whether internal or external facing, have impacts on a variety of initiatives including enrolment and student experience. Departments also expressed uncertainty about program approval pathways, noting that inconsistent guidance makes it difficult to plan new offerings or introduce program changes. Many still have basic questions about short programs, including what qualifies as a microprogram, how approval steps differ by program type, and how stackable degrees should work.

Another issue raised during the enrolment discussions was a limited understanding of how central teams operate. Most academic departments are unsure of the role or purpose of the central recruitment, retention, communications, and curriculum teams and what services and/or support they offer. Without this clarity, teams miss opportunities to collaborate, coordinate outreach, or strengthen recruitment and retention efforts.

Academic departments expressed a consistent desire to work more closely with central units to achieve common enrolment and retention goals. To do so, they expressed a strong need for both comprehensive and accessible information about what is available in addition to a more reliable and service-oriented approach from central teams.

Setting targets

Following the enrolment discussions, academic units were asked to set targets for new registrations for the next two academic years (2026 and 2027). This process was intentionally designed as a bottom-up exercise, grounded in departmental expertise and context. By asking units to set enrolment targets for their own programs, the process reinforced departmental ownership of enrolment management and acknowledged that academic units are best positioned to assess realistic growth opportunities and constraints.

Departments were encouraged to consider program capacity, curriculum plans, staffing, space limitations, and discipline-specific trends when defining their targets. In this way, targets were intended to be grounded in the operational and academic realities of each department, rather than driven solely by historical patterns or centralized top-down assumptions.

Department-defined targets also provide important benefits to central units responsible for institutional planning and revenue projections. Compared to approaches relying primarily on historical trends, department-informed targets allow for more accurate forecasting by accounting for anticipated program-level declines, plateaus, or growth. In addition, the articulation of enrolment targets and their assumptions enable central recruitment teams and associated service units to better align their efforts, priorities, and resource allocation.

Based on the targets collected, new registrations are expected to increase by **2.2% in 2026**, and **3.8% in 2027**.

It was well understood that defining targets in February 2026 for the 2026 academic year was late, and that this timing did not give departments nor recruitment teams enough opportunity to act on the targets in a meaningful way. Moving forward, targets should be set by September for departments and central units have enough time to act on them and plan effectively for the following year's intake.

Priorities for consideration

Several institution-level priorities emerge from the APPC's review as part of its mandate to assess academic planning directions and make recommendations to Senate. The below list of priorities reflects the concerns and/or requests from academic departments throughout the enrolment discussions.

A. Build infrastructure for stackable and flexible pathways

Concordia needs to build clear, flexible, and navigable academic pathways that allow learners to progress seamlessly through programs over time. This includes enabling structured accumulation

of credentials (e.g., 3 certificates for a bachelor's) and creating transparent progression routes that support movement across levels and partner institutions (e.g., TEC-DEC agreements).

Building these pathways is seen as a high-return strategy for broadening Concordia's applicant pool and increasing enrolment in ways that better support the University's long-term financial sustainability.

Delivering on this would require clearer academic rules on credit recognition, SIS compatibility to properly process stacked credentials, and smoother admission and progression processes for students.

B. Develop an institutional online strategy

Currently, there is limited guidance and uneven infrastructure limiting the thoughtful expansion of online programming. Concordia would benefit from a clear institutional strategy that aligns technology, pedagogy, and support systems to enable scalable and high-quality online learning.

Such a strategy would clarify when and why programs or components should be offered online, identify areas best suited for selective online or hybrid development, establish definitions and standards for quality and delivery, and outline the supports required for both faculty and students. This approach would ensure that online delivery is used intentionally and where it makes pedagogical, academic, and strategic sense, rather than as a default learning modality to expand.

A coherent online strategy would support informed decision-making across the institution, ensuring that online offerings complement rather than replace on-campus learning. It would also strengthen Concordia's ability to reach specific audiences such as remote learners, working professionals, and other non-traditional students.

C. Market to specific learner segments

Concordia should position itself more deliberately as a destination for different learner types by ensuring that programs intended for different audiences are visible, coherent, and easily discoverable. While many departments already serve a mix of different learner segments, this diversity is not reflected in how programs are currently structured and presented on our website.

To reach these groups more effectively, the University needs clearer, audience-based definitions and consistent terminology across programs. We need to identify which offerings are intentionally designed for which learners and ensure that this information is communicated clearly through program webpages, and marketing materials. Improving the visibility of programs with evening, weekend, online, and/or part-time options would allow working professionals and other non-traditional learners to quickly recognize what fits their needs.

Developing an institutional approach to learner segmentation would guide program design, advising, scheduling, and communications, while helping Concordia diversify its prospective student pool and strengthen recruitment across multiple learner segments.

US-2026-3-D5
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Committee and Tribunal Pool appointments

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve the following Committee and Tribunal Pool appointments:

Committee	**Appointee**	**Term**
Academic Planning and Priorities (APPC)	Luigi Allemano (FOFA)	2026-29
	Mojtaba Kheiri (GCS)	2026-29
DPE/DLE	Michèle Paulin (JMSB)	2026-29
	Michelle McGeough (FOFA)	2026-05-15 – 2026-06-30
Library	Mohsen Farhadloo (JMSB)	2026-29
	Alireza Nazemi (GCS)	2026-29
Research	Mireille Paquet (FAS)	2026-27
	Erkan Yönder (JMSB)	2026-29
	Catherine Mulligan (Faculty Senator)	2026-09-01 – 2026-12-31
	Ted Stathopoulos (Faculty Senator)	2027-01-01 – 2027-12-31
Steering	Alexandra Dawson (JMSB)	2026-27
	Ted Stathopoulos (GCS)	2026-27

Appointments requiring Senate ratification	**Appointee**	**Term**
Faculty Tribunal Pool	Anjan Bhowmick (GCS)	2026-29
	Alexandre Paradis (GCS)	2026-29
	Tiberiu Popa (GCS)	2026-29
	Sumin Song (SGS)	2026-29
	Ishita Tiwary (FOFA)	2026-29
	Pouya Valizadeh (GCS)	2026-29

DRAFT MOTION:

That the Committee and Faculty Tribunal Pool appointments be approved.

PREPARED BY:

Name: Secretary of Senate
Date: May 7, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

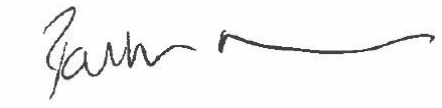
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

Graduate Program Regular Curriculum Change - JMSB-CPA-5976 - VERSION : 1

Summary and Rationale for Changes

The proposed changes to the existing 30-credit Graduate Diploma in Chartered Professional Accountancy (CPA) are a result of the new certification requirements for CPA candidates and the new accreditation requirements for university-level graduate CPA programs by the CPA Quebec Order, following the CPA Competency Map 2.0. Under the new CPA certification requirements, CPA candidates write in a modular and progressive fashion three Order Exams in addition to obtaining 24 months of qualifying professional accountancy experience before obtaining the CPA designation. The Graduate Diploma in CPA develops the required professional accountancy competencies and prepares CPA candidates for writing the Order Exams I and II, while the preparation for Order Exam III is exclusively offered by the educational programs of the CPA orders at the end of the 24 months of qualifying work experience.

The proposed program starts with a module on foundational development and core accountancy competencies (13.5 credits), followed by the module Capstone I-A (3 credits) that integrates acquired core competencies and prepares for writing Order Exam I-A. CPA candidates can choose whether they pursue the licensure track to become public accountants (CPA Auditor). This requires writing Order Exam I-B. The proposed program offers this licensure track through the module Capstone I-B (4.5 credits). Students that do not pursue the licensure track have alternative options in the proposed program to foster their professional accountancy competencies. In addition, the program has one elective course (3 credits). The final part of the proposed program encompasses the leadership module (6 credits), in which CPA candidates obtain advanced professional accountancy competencies, applied in undirected and more complex decision-contexts. This module prepares CPA candidates for writing Order Exam II.

Note: This proposal does not change the existing CPA courses in the graduate calendar given that students that are currently enrolled in the Graduate Diploma in CPA and the prospective students of the last intake into the current Graduate Diploma in CPA in this summer term 2026 must follow the current program structure and courses to comply with the certification requirements of the CPA Quebec Order. A subsequent proposal will address the existing courses in the Graduate Diploma in CPA.

Resource Implications

The current Graduate Diploma in Chartered Professional Accountancy entails 30-course credits. The redesigned program encompasses up to 30 course-credits. The redesigned program will be delivered with the current faculty composite and requires up to 30 credits to be offered.

Students that choose the licensure track complete 27-course credits and have the option to earn 3 credits for qualifying work experience or take an elective course for up to 3 credits. Students that do not choose the licensure track complete 22.5-course credits and have the following options: either switch during their studies into the Graduate Certificate in Chartered Professional Accountancy, earn a total of 7.5 credits for qualifying work experience or take elective courses for up to 7.5 credits.

The current Graduate Diploma in Chartered Professional Accountancy requires to offer a total of 124 course credits per academic year (i.e., multiple sections of the same course per academic year) to serve the three intakes of CPA Candidates. It is expected that the required total course credits per academic year under the redesigned Graduate Diploma in Chartered Professional Accountancy for the three intakes of CPA Candidates will range between 114 and 120 course credits. The reason for the reduction is that the redesigned program entails the option to earn 3 credits for qualifying work experience (Applied Work Experience course with deliverables and pass-and-fail assessment) as opposed to taking a lecture-based instructor-led course, reducing the number of teaching credits awarded in the redesigned Graduate Diploma. Furthermore, the current CPA certification program requires CPA candidates to choose among four elective depth roles [Assurnace, Finance, Performance Management, and Tax] on the CPA Common Final Examination (CFE). The new CPA certification program only has the common CPA role and the additional CPA licensure role. This change reduces the number of elective courses that are currently offered in the CPA Graduate Diploma.

Graduate Program Regular Curriculum Change - JMSB-CPA-5976 - VERSION : 1

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 17 Mar 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission **JMSB-CPA-5976; APC-2026-2-D2**. As a result of discussions, APC resolved that **JMSB-CPA-5976; APC-2026-2-D2** be forwarded to Senate for approval.

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 17 Mar 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 16 Feb 2026

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2526 3 D1). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Programs and Development,
Graduate Curriculum Committee, 16 Feb 2026

Approved by:

Anne-Marie Croteau, Dean, John Molson School of Business,
Faculty Council, 30 Jan 2026

Please find attached the proposal for the CPA - Redesigned Diploma. The JMSB Faculty Council Committee approved these changes on January 30, 2026. I kindly request that the proposed changes be presented for consideration at the February 16, 2026 meeting of the Graduate Curriculum Committee.

Summary of Committee Discussion: FCC/FAPC Approval

For Submission to:

Anne-Marie Croteau, Dean, John Molson School of Business,
Faculty Council, 30 Jan 2026

Approved by:

Sandra Betton, Associate Dean, Professional Graduate Programs,
Faculty Academic Programs Committee, 16 Jan 2026

Please find attached the proposal for the CPA - Redesigned Diploma. The JMSB Faculty Academic Programs Committee (FAPC) approved these changes on January 16, 2026.

I kindly request that the proposed changes be presented for consideration at the January 30, 2026 meeting of the Faculty Council of the John Molson School of Business.

CPA Graduate Diploma Redesign

Information Package, December 9, 2025

Outline

- 1. Background Information
- 2. Redesigned Program

1. Background Information

Context & Resulting Milestones

- **In winter 2022**, CPA Canada released the *CPA Leading the Way: Competency Map (CM) 2.0* after a comprehensive, stakeholder-based consultation process, identifying the educational and expertise required by Canadian CPAs
- CPA Program Director and other faculty part of the consultation process by CPA Quebec and CPA Canada
- **In winter 2023**, a first draft version of the CPA Certification 2.0 framework was communicated, initiating a comprehensive, stakeholder-based feedback process
- In summer term 2023, work of the Departmental **Summer 2023 Task Force "ACCO 2.0"** *[see next slide]*
- CPA Program Director and other faculty part of the feedback process on CPA Certification 2.0
- In **September 2025**, CPA Quebec and other provincial CPA orders publicly announce the new CPA Certification 2.0 called CPA Professional Program
- In fall term 2025, work of the **Task Force "CPA Graduate Diploma Redesign"** *[see subsequent slide]*

Upcoming Milestones:

- **Before April 2026** submission of redesigned Concordia Diploma in CPA to CPA Quebec Order for program accreditation
- Approved graduate calendar changes for **Fall Term 2026**
- **01.01.2027** new CPA Professional Program starts and targeted launch of redesigned Concordia Diploma in CPA

Summer 2023 Task Force: "ACCO 2.0"

- Objective: Reflect and brainstorm on the future program offerings in the department in the spirit of continuous curriculum development and enhancement and by the (anticipated) changes to the CPA educational requirements, employment trends, as well as societal and technological developments.

- Members of the Task Force:
  - Salvatore Colavita*, Advisor, CPA Program (position at the time of task force meeting)
  - Patrick Delaney
  - Gail Fayerman
  - Eva Lagou, Director Graduate Diploma in Chartered Professional Accountancy (position at the time of task force meeting)
  - Mervat Saleh
  - Mercedes Santamaria
  - Matthäus Tekathen
  - Tanya Volpe-Standing, Department Administrator (position at the time of task force meeting)
- Special Guests for second meeting:
  - Louise Anne Côté, Director Career Management Services
  - Bob Menard, Graduate Career Advisor
  - Topic: Present placement statistics of accountancy students and career trends

- The task force has met 3 times during summer term 2023 in addition to preparation and review time.
- Output: 27-page discussion paper that includes, among others a SWOT analysis, competitive advantage analysis, and ideation section for the John Molson Accountancy Graduate Offerings.

*Position information added in cases where a member had a different role at the time of the meeting than today.

Task Force: CPA Graduate Diploma Redesign Fall 2025

- Mandate: Develop a proposal for the redesigned CPA program in light of CPA CM2.0 and Certification 2.0

- Members of the Task Force:
  - Batoul Al-Sinan
  - Vanessa Campbell (voting member)
  - Patrick Delaney (voting member)
  - Sabrina Lairy (voting member)
  - Patricia Leduc
  - Frédérica Martin
  - Giuseppe Maselli (voting member)
  - Mervat Saleh (voting member)
  - Mercedes Santamaria
  - Matthäus Tekathen (voting member)

- The task force has met 7 times during fall term 2025 as well as two sub-team meetings for mapping and preparing of high-level course summaries

Sub-Team Meeting for Mapping and Preparation of High-Level Course Summary

Specific Competencies	Teams
Assurance and Trust	Patrick Delaney
Big Data and Data Analytics	Matthäus Tekathen
Ethical Decision-Making and Organizational Governance/Data Governance	Patrick Delaney
Finance	Giuseppe Maselli
Financial Reporting	Mervat Saleh, Sabrina Lairy, and Vanessa Campbell
Management Decision-Making and Information Systems/Technology	Giuseppe Maselli and Sabrina Lairy
Non-Financial Reporting	Mervat Saleh and Vanessa Campbell
Strategy, Risk Management and Innovation	Sabrina Lairy
Tax	Mervat Saleh and Giuseppe Maselli
Value Creation	Sabrina Lairy

In addition, Eva Lagou prepared the high-level course summary of the last courses in the CPA program (part of leadership module)

Timeline & Process

Fall Term 2025

Program Design

Process & Session Planning:

- 1st Meeting: Planning
- 2nd Meeting: Academic Guide Analysis
- Over 2-weeks: Overarching Program Mapping: Small Team Mapping of Specific Competencies
- 3rd Meeting: Program Proposal Draft & Program Positioning Discussion
- 4th Meeting: Program Proposal Draft, Scheduling and Focus Group Planning
- 5th Meeting: Embedding a) CPA Ethical Mindset and CPA Advanced Professional Competencies + b) Foundational and Sub-Foundational Competencies + Evaluation of Proposals
- 6th Meeting: Voting on Proposal
- 7th Meeting: Course Sequencing, Feedback Focus Group and Initial Survey
- Over 1.5-weeks Preparation of High-Level Course Summaries in Small Teams

Submission of Information Package: CPA Program Committee Meetings
Submission of Information Package: Accountancy Department

Success metric:
- Meeting internal approval deadline
- CPA Program Accreditation

Timeline & Process



Approval Chains and Timeline:

Approval chains:

- CPA Program Committee > Department > FAPC > FC > GCC > APC > Senate > Fall 2026 calendar
- CPA Quebec Order Accreditation (Dossier submission beg. April 2026)

Important Background Note

- To **offer the program in 2027**, we need to **meet the Fall Term 2026 publication deadline**.
- Approval chain: CPA Program Committee > Department > FAPC > FC > GCC > APC > Senate > Fall 2026 calendar

Timeline & Process



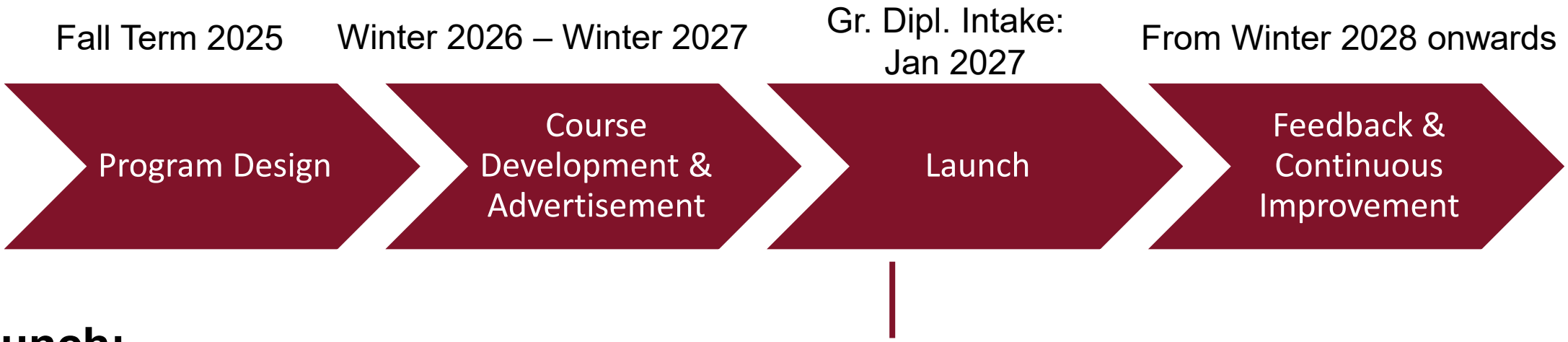
Course Development:

- Course development leads/teams start in the winter term 2026
- Presentation to CPA Program Committee in late fall term 2026

Program Advertisement:

- Advertisement of redesigned program can start after APC approval (May 2026)

Timeline & Process



Launch:

- 01.01.2027 Graduate Diploma Intake
- First intake – winter 2027: Light course start over the winter term and required courses launched during summer to prepare for Order Exam I in mid-September
- CPA Quebec offers in May 2027 first module of the new program

Timeline & Process



Continuous improvement:

- Ongoing program and course improvement based on feedback and lessons learnt

CM 2.0 – Competency Groupings

CPA Ethical Mindset and CPA Advanced Professional Competencies		Specific Competencies for Topic Areas		Foundational and Sub-Foundational Competencies for Topic Areas
Critically evaluate actions and decisions using: • an ethical mindset, including professional skepticism, • optimal technology, • applying system thinking, and • recognizing the need to ask a more experienced CPA The 5 steps in facilitating and implementing performance-related decisions include: **Step 1** – Assess the situation and decide what needs to be done **Step 2** – Plan/design approach **Step 3** – Implement plan, including measuring and monitoring progress, recalibrate where necessary. **Step 4** – Complete project/decision. **Step 5** – Reflect and Learn		1. Assurance and Trust 2. Big Data and Data Analytics 3. Ethical Decision-Making and Organizational Governance/Data Governance 4. Finance 5. Financial Reporting 6. Management Decision-Making and Information (data) Systems/Technology 7. Non-Financial Reporting 8. Strategy, Risk Management, and Innovation 9. Tax 10. Value Creation		Foundational Topic Areas: 1. Economics and the underlying areas of Quantitative methods and probability 2. Law and Legal Forms of Business 3. Organizational Behaviour 4. Sustainability Sub-foundational Topic Areas: 1. Emerging and transformative technologies 2. Equity, Diversity, and Inclusion 3. Indigenous views/ Indigeneity 4. System Thinking and complexity Theory

DRAFT

Comparison: Specific Competency Progression Coverage

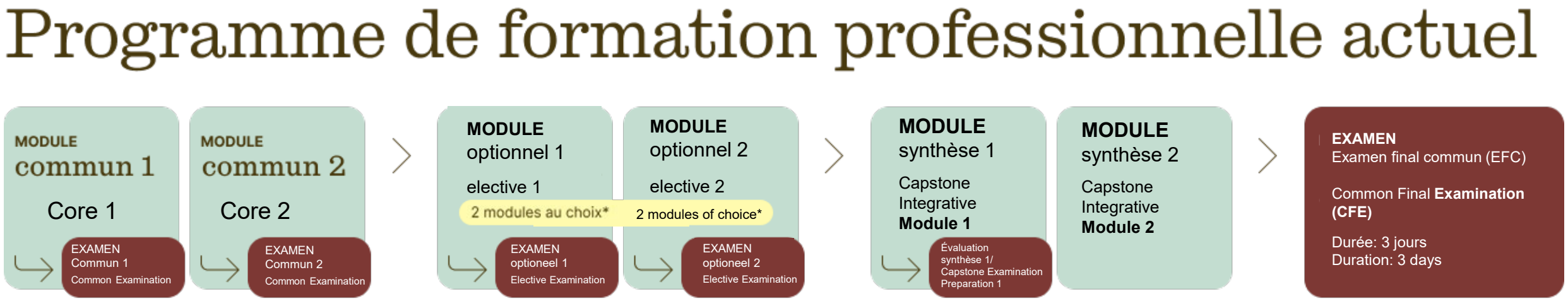
Specific Competencies	Foundational (Directed manner) [guide p. 33]	CPA Core – Common (increased levels of proficiency) [guide p. 45]	CPA Core – Licensure (increased levels of proficiency) [guide p. 57]	CPA Professional Leadership (Apply undirected manner, integrate competencies)
I. Assurance and Trust	X	X	X	No progression from CPA Core
II. Big Data and Data Analytics	No progression from UG	X		No progression from CPA Core
III. Ethical Decision-Making and Organizational Govern./Data Governance	X			X
IV. Finance	X			X
V. Financial Reporting	X Same footnote from UG, little change in verbs	X	X	No progression from CPA Core
VI. Management Decision-Making and Information Systems/Technology	X			X
VII. Non-Financial Reporting	No progression from UG	X		No progression from CPA Core
VIII. Strategy, Risk Management and Innovation	X			X
IX. Tax	X Same footnotes from UG, little change in verbs	X	X	No progression from CPA Core
X. Value Creation	X			X

CM 2.0 - Understanding the Learning Outcomes (LOs)

Developing competencies is completed through learning and practical experience. The progression throughout the program takes place in a number of ways, including:

- Introducing new learning outcomes as learners progress through the CPP.
- Increasing proficiency levels.
- Increasing complexity of decision-making situations, including the CPA Ethical Mindset

Current Program Structure



*Gestion de la performance, Finance, Certification ou Fiscalité.
Pour obtenir le permis de comptabilité publique, les modules Certification et Fiscalité doivent être réussis.

*Performance Management, Finance, Assurance or Taxation
To obtain the public accounting license, the Assurance and Taxation modules must be successfully passed.

LE NOUVEAU PROGRAMME PROFESSIONNEL
CPA PROFESSIONAL PROGRAM (CPP)

MODULE
Apprentissage des bases

MODULE
Foundational Development

EXAMEN des bases — Foundational Exam

MODULE
Essentiels de la pratique professionnelle
(Tronc commun)

MODULE
CPA Core – Common

Examen/Exam:
professionnel final, partie 1 /
Professional Final Exam Part 1

Ou/Or

Module
Essentiels de la pratique professionnelle
(Tronc commun + Comptabilité publique)

MODULE
CPA Core – Licensure
(Common core + Licensure)

Examen/Exam:
professionnel final, partie 1
(version comptabilité publique) /
Professional Final Exam Part 1
(licensure version)

MODULE
Leadership professionnel

MODULE
CPA Leadership

Examen/Exam:
professionnel final, partie 2 /
Professional Final Exam Part 2

MODULE
Préparation à la pratique professionnelle

Module offert uniquement par l'Ordre

MODULE
CPA Professional Readiness

Module offered only by the order

Examen/Exam:
professionnel final, partie3 /
Professional Final Exam Part 3

Stage CPA | 24 mois

Expérience professionnelle **de base** (maximum 8 mois)
Expérience professionnelle **avancée** (minimum 16 mois)

CPA Work Experience | 24 months

Foundational work experience (maximum 8 months)
Professional work experience (minimum 16 months)

Background: The new CPP (CPA Professional Program)

Modules 1 to 3 offered by universities

Module 4 offered by Order only

MODULE
Apprentissage des bases

MODULE
Foundational Development

No Order Exam!

~~EXAMEN des bases Foundational Exam~~

MODULE
Essentiels de la pratique professionnelle
(Tronc commun)

MODULE
CPA Core – Common

Order Exam 1 (A)

Ou/Or

Module
Essentiels de la pratique professionnelle
(Tronc commun + Comptabilité publique)

MODULE
CPA Core – Licensure
(Common core + Licensure)

Order Exam 1 (A+B)

MODULE
Leadership professionnel

MODULE
CPA Leadership

Order Exam 2

MODULE
Préparation à la pratique professionnelle

Module offert uniquement par l'Ordre

MODULE
CPA Professional Readiness

Module offered only by the order

Module not offered by universities!

Order Exam 3

Stage CPA | 24 mois

Expérience professionnelle **de base** (maximum 8 mois)
Expérience professionnelle **avancée** (minimum 16 mois)

CPA Work Experience | 24 months

Foundational work experience (maximum 8 months)
Professional work experience (minimum 16 months)

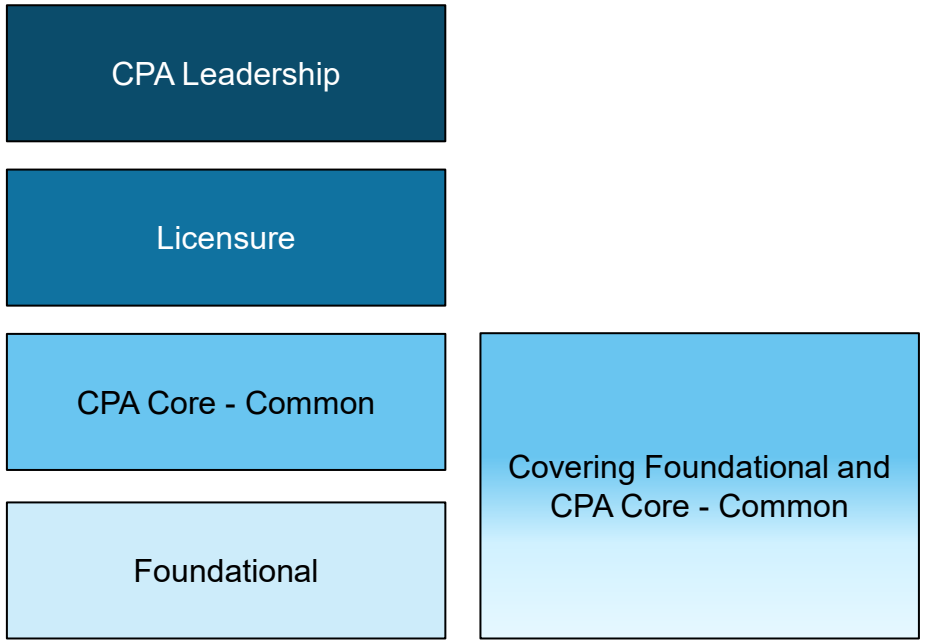
2. Redesigned Program

CPA Program Committee and Department Approved:

- Program Structure with associated courses, including the course number and title, course descriptions, as well as prerequisites and notes

Terminology

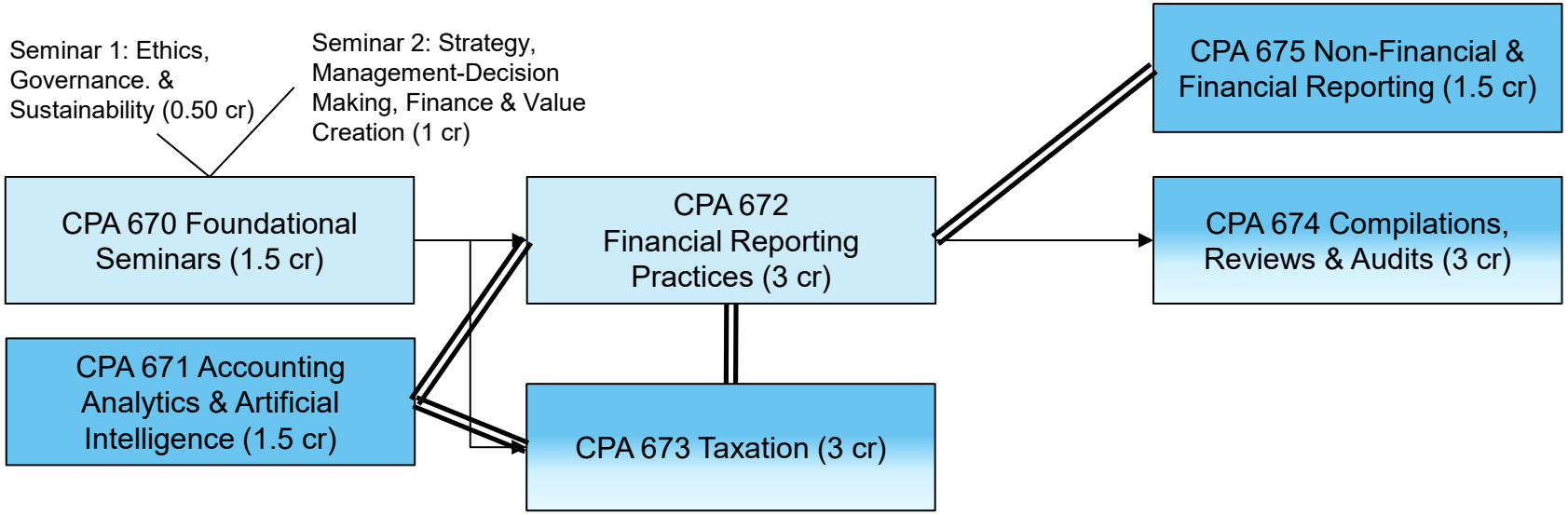
Colour Code used for courses, referring to modules/levels of CPA Professional Program (CPP)



Course Numbers used: CPA 600er-level

Redesigned CPA Program (1/5)

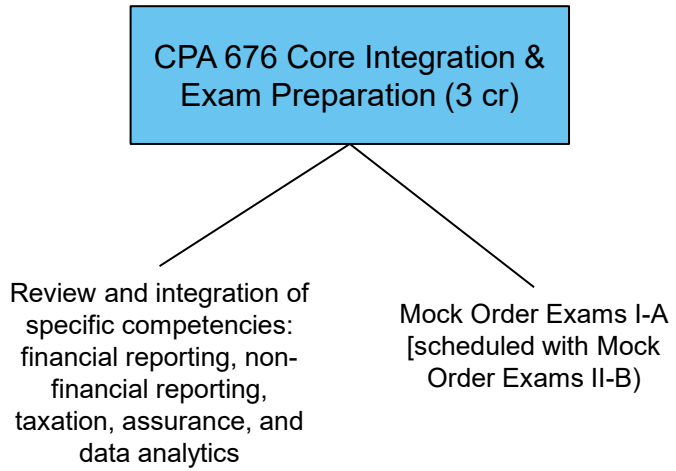
Module: Foundational Development & Core (13.5 course-credits)



Notes:
A prerequisite refers to a course that should be completed before the course that appears at the tip of the arrow (→).
A prerequisite or co-requisite refers to a course that can be completed in the same term as the course linked by the double line (=).

Redesigned CPA Program (2/5)

Captone I-A Module: Core Common Preparation [Order Exam I-A Preparation] (3 credits)



Notes:
A prerequisite refers to a course that should be completed before the course that appears at the tip of the arrow (→).
A prerequisite or co-requisite refers to a course that can be completed in the same term as the course linked by the double line (**=**).

Redesigned CPA Program (3/5)

Elective Course (3 credits)

Chosen from:

CPA 677
Applied Professional
Accouting I (3 cr)[1]

or

Up to 3 credits of other additional and relevant 600er-level ACCO, CPA, or graduate-level courses subject to the approval by the Program Director [value-adding training beyond CPA requirement[2]

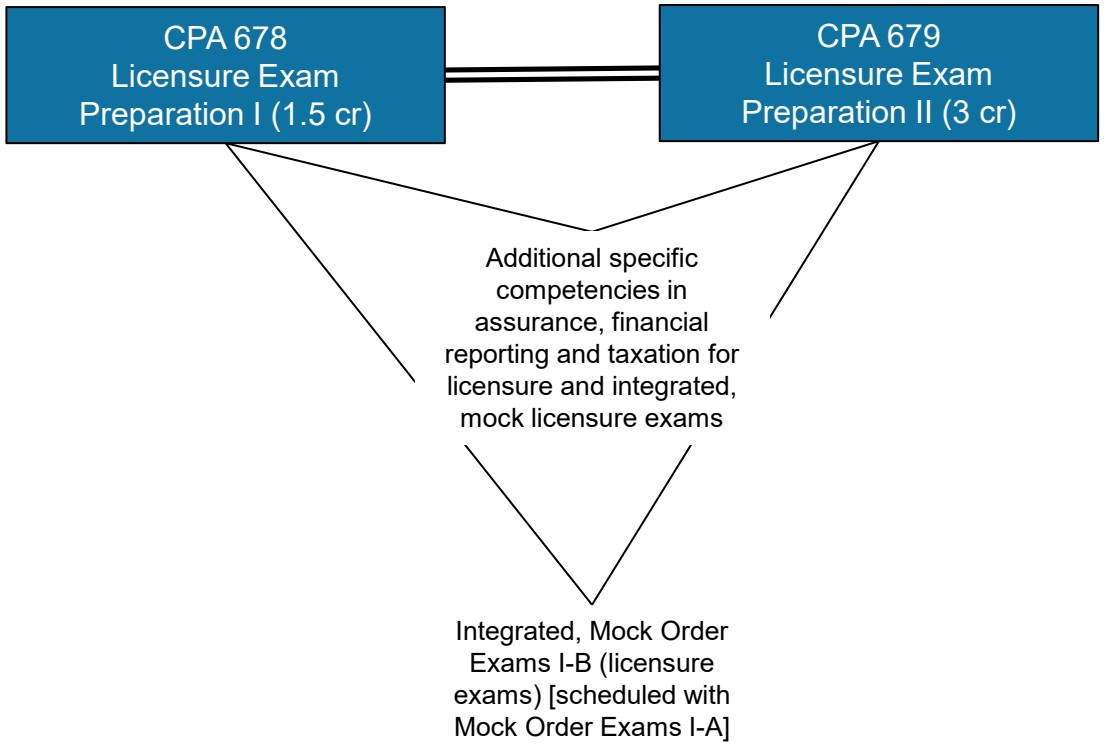
[1]Students receive credits, no teaching credits for instructors.

Notes:
A prerequisite refers to a course that should be completed before the course that appears at the tip of the arrow (→).
A prerequisite or co-requisite refers to a course that can be completed in the same term as the course linked by the double line (=).

Redesigned CPA Program (4/5)

Two Options (Licensure & Non-Licensure Track, depending on student's interests and career aspirations)

Option 1: Captone I-B Module: Licensure Preparation [Order Exam I-B Preparation] (4.5 credits)



Option 2: [Non-Licensure Track] Applied Professional Accountancy (4.5 credits)

CPA 678
Applied Professional
Accounting II (3 cr)

+

CPA 679
Applied Professional
Accounting III (1.5 cr)

or

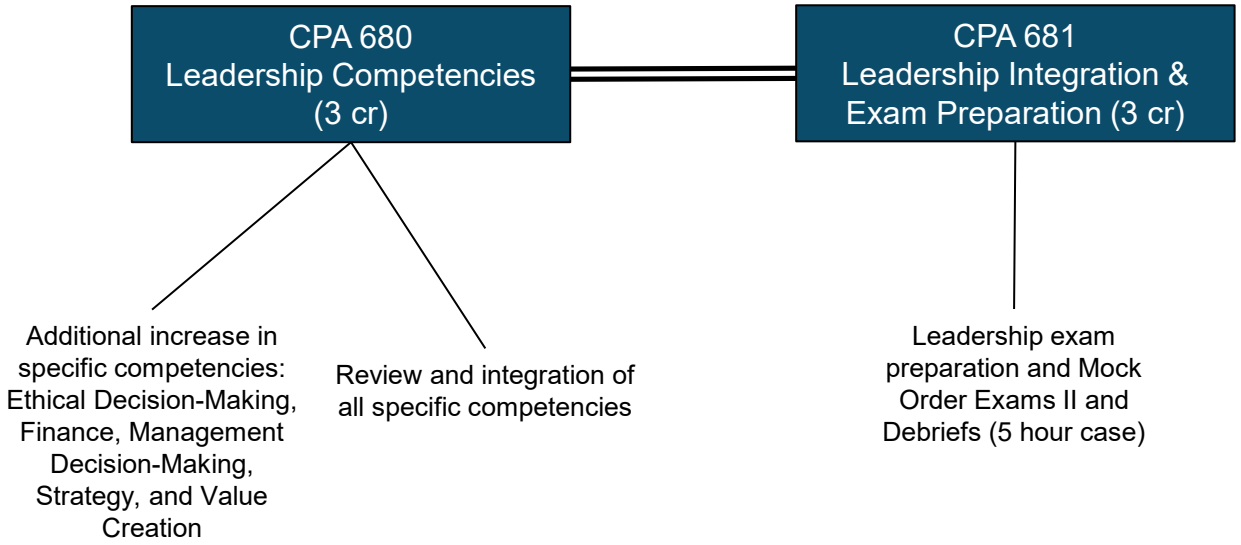
Up to 7.5 credits of other additional and relevant 600er-level ACCO, CPA, or graduate-level courses subject to the approval by the Program Director

or

Graduation with a Certificate in CPA (21 credits)

Redesigned CPA Program (5/5)

Capstone II Module: Leadership Preparation [Order Exam II Preparation] (6 credits)



Notes:
A prerequisite refers to a course that should be completed before the course that appears at the tip of the arrow (→).
A prerequisite or co-requisite refers to a course that can be completed in the same term as the course linked by the double line (=).

Program Structure: Summary

Note:
- 27 course-credits for Licensure track
- 22.5 course-credits for Non-Licensure track
- Graduating option after completing 21 course-credits as Certificate in CPA

30 credits Diploma
27-course credits[2]

CPA Permit

Student Milestones

Complete 24 months CPA work experience

Professional work experience (minimum 16 months)

[3]Non-licensure students can take up to 7.5 credits for 600er-level electives or up to 7.5 credits for Applied Professional Accounting [CPA 677 (3 cr), CPA 682 Applied Professional Accounting II (3 cr), and CPA 683 Applied Professional Accounting III (1.5 cr.) [combination also possible]

*Write Order Exam II **or** write Order Exam I & II combined*

CPA 681
Leadership Integration & Exam Preparation (3 cr)

CPA Professional Leadership

CPA 680
Leadership Competencies (3 cr) [including fostering specific competencies III, IV, VI, VII & X]

Write Order Exam I-A+B

Licensure Module

CPA 679
Licensure Exam Preparation II (3 cr)

CPA 678
Licensure Exam Preparation I (1.5 cr)

Required for licensure track only[4]

Write Order Exam I-A

Foundational work experience (maximum 8 months)

CPA 677 Applied Professional Accounting I (3 cr)[1]
OR
3 credits 600er ACCO electives [value-adding training beyond CPA][3]

CPA 676 Core Integration & Exam Preparation (3 cr) [concurrently CPA 679]
[FR, Non-FR, Taxation, Assurance, & Data Analytics]

CPA Core - Common

CPA 671 Accounting Analytics & Artificial Intelligence (1.5 cr)

CPA 675 Non-Financial & Financial Reporting (1.5 cr)

CPA 673 Taxation (3 cr)

CPA 674 Compilations, Reviews & Audits (3 cr)

Foundational

CPA 670 Foundational Seminars (1.5 cr)

CPA 672 Financial Reporting Practices (3 cr)

Ethics, Governance. & Sustainability (0.50 cr)

Strategy, Management-Decision Making, Finance & Value Creation (1 cr)

CPA Work Experience (24 months)

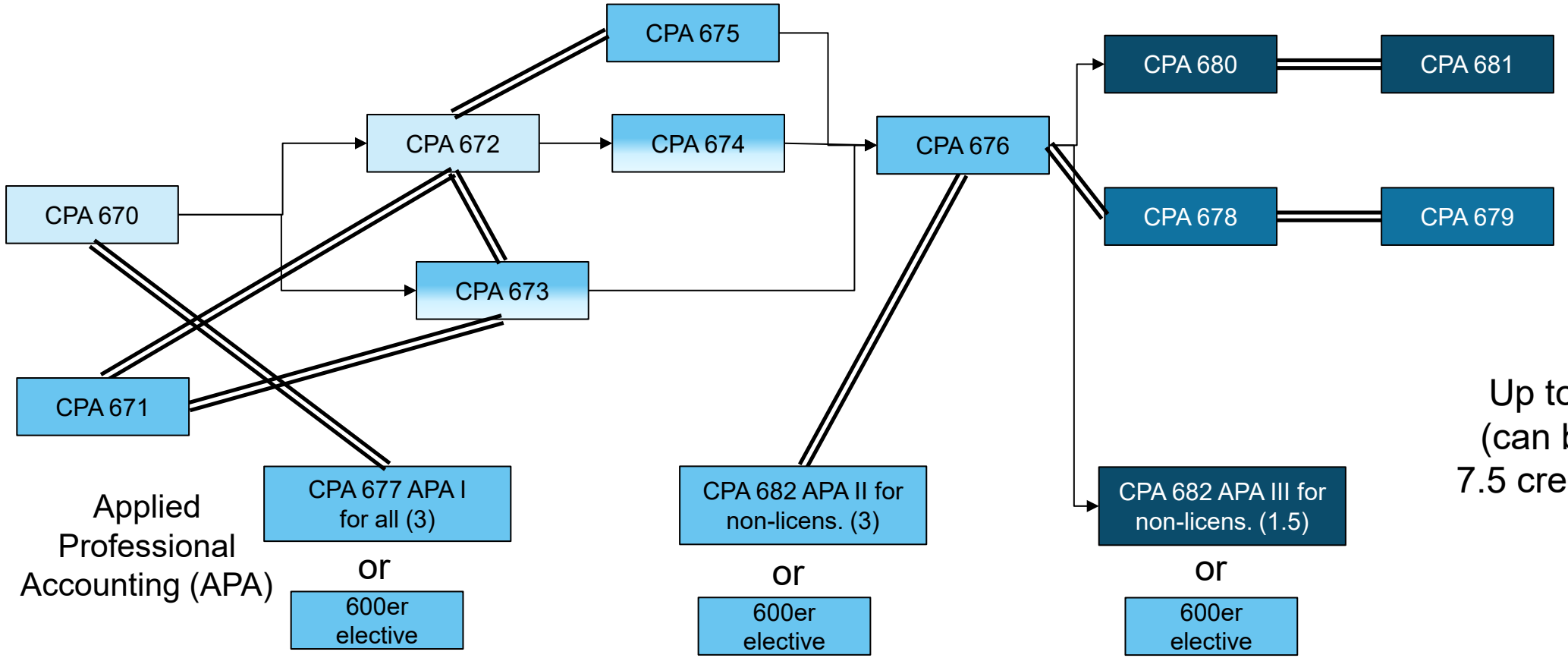
CPA Graduate Studies

[2]Credits required to meet CPA required learning outcomes.

[1]Students receive credits, no teaching credits for instructors.

CONCORDIA

Course Sequence



Optional Licensure Module (4.5 cr)

or

Up to 7.5 credits for APA (can be replaced by up to 7.5 credits for 600er elective)

or

Graduation with a Certificate in CPA (21 credits)

Notes:
A prerequisite refers to a course that should be completed before the course that appears at the tip of the arrow (→).
A prerequisite or co-requisite refers to a course that can be completed in the same term as the course linked by the double line (=).

CPA 670 Foundational Seminars (1.5 cr)

This course consists of two foundational seminars designed to introduce students to the ethical, strategic, and performance dimensions of the accounting profession. The first seminar addresses the topic areas of Ethical Decision-Making, Organizational Governance, and Sustainability. The second seminar focuses on the topic areas of Finance, Management Decision-Making, Strategy, Risk Management and Innovation as well as Value Creation. Students use case-based learning in both seminars. Upon successful completion of the seminars, students are able to integrate foundational accountancy competencies across a range of decision-making contexts, demonstrating awareness of the ethical and professional implications inherent in their judgments.

Prerequisite: None

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description: CPA Academic Guide, p. 28 + p. 45 + learning outcome spreadsheet

CPA 671 Accounting Analytics & Artificial Intelligence (1.5 cr)

In this workshop, students acquire competencies in data analytics, data governance, the use of artificial intelligence, and other technologies relevant for assurance, business advisory, and industry mandates of professional accountants. Using an applied teaching approach, students use technology to analyze and assess a multitude of decision scenarios and contexts, supporting their development of the advanced professional competencies as well as the specific accountancy competencies in Big Data and Data Analytics, Data Governance, as well as in Management Decision-Making and Information Systems/Technology. Upon successful completion of the workshop seminar, students know how to integrate technology into the diverse work portfolio of professional accountants.

Prerequisite: None

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 28 + learning outcome spreadsheet

CPA 672 Financial Reporting Practices (3 cr)

In this course, students obtain core competencies in financial reporting for routine transactions of many financial accounting and reporting issues at a low to moderate level of complexity. Using a case-based teaching approach, students apply appropriate accounting treatment, using alternative accounting frameworks. By the end of the course, students are equipped to make routine financial reporting decisions, using an ethical mindset and the advanced professional competencies.

Prerequisites: CPA 670 (previously), CPA 671 (previously, or concurrently)

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 36+37 + learning outcome spreadsheet

CPA 673 Taxation (3 cr)

In this course, students develop core competencies in taxation. Using a case-based teaching approach, students apply appropriate tax treatment in compliance with tax laws and regulations for a broad range of routine tax events or transactions and tax planning at a low to moderate complexity. Upon successful completion of the course, students are capable to address routine taxation issues, using an ethical mindset and the advanced professional competencies.

Prerequisites: CPA 670 (previously), CPA 671 and CPA 672 (concurrently, or previously)

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 41, 54 and 55 learning outcome spreadsheet

CPA 674 Compilations, Reviews & Audits (3 cr)

In this course, students obtain core competencies in compilations, reviews, and audits of historical financial information. Using a variety of teaching methods that focus on a case-based teaching approach, students apply appropriate standards with an ethical mindset to these projects. Upon successful completion of this course, students are trained to perform compilations, reviews, and audits of historical financial information that serves the public interest.

Prerequisites: CPA 672

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 45 + p. 49 + learning outcome spreadsheet

CPA 675 Financial & Non-Financial Reporting (1.5 cr)

In this course, students develop core accountancy competencies in financial and non-financial reporting at a low to moderate complexity. Using a case-based teaching approach, students apply the advanced professional competencies in making financial and non-financial reporting decisions. By the end of the course, students are prepared to analyze the appropriateness of financial and non-financial reporting options in diverse decision scenarios and contexts.

Prerequisite: CPA 672 (previously, or concurrently)

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 36-37, 52 + learning outcome spreadsheet

CPA 676 Core Integration & Exam Preparation (3 cr)

In this course, students integrate and enhance the previously acquired accountancy competencies to apply them to performance-related decisions in a multitude of scenarios and contexts at increased levels of proficiency. Using exam simulations, the course is designed specifically for students writing the CPA Professional Final Exam – Part 01 on the CPA Core – Common.

Prerequisites & notes

Prerequisites: CPA 673, 674 and 675

There will be a surcharge for this course.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 45 + current description of ACCO 659 called examination preparation.

*Note taken from ACCO 659: Capstone II Examination Preparation. https://www.concordia.ca/jmsb/programs/graduate/cpa/program-details/curriculum.html

CPA 677 Applied Professional Accounting I (3 cr)

In this course, students enhance their professional accounting competencies through acquiring three months of qualifying work experience in accountancy. During the course, students submit their professional accounting work plan. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.

Prerequisite: CPA 670 (concurrently, or previously)

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 13

Assessments: Submitted work plan and reflective interview or written report

CPA 678 Licensure Exam Preparation I (1.5 cr)

In this course, students integrate and foster the previously acquired accountancy competencies to apply them to taxation projects in a multitude of scenarios and contexts at increased levels of proficiency. The course is designed specifically to cover additional taxation and integration topics relevant for licensure projects. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.

Prerequisites & notes

Prerequisites: CPA 676 (concurrently, or previously)

Notes: This course is required for students in the licensure track.

There will be a surcharge for this course.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 60-61 + learning outcome spreadshet

*Note taken from ACCO 659: Capstone II Examination Preparation. https://www.concordia.ca/jmsb/programs/graduate/cpa/program-details/curriculum.html

CPA 679 Licensure Exam Preparation II (3 cr)

In this course, students obtain core competencies in performing licensure projects that fall within and outside the scope of the CPA Canada Handbook - Assurance. Using a case-based teaching approach, students apply appropriate methodology and an ethical mindset to diverse assurance and trust engagements. The course is further designed to cover additional financial reporting and integration topics relevant for licensure projects. By the end of the course, students know how to bring logic, structure and trust to information to protect the public and act in the public interest. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.

Prerequisite & notes:

Prerequisite: CPA 678 (concurrently, or previously)

Notes: This course is required for students in the licensure track.

There will be a surcharge for this course.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 45 + p. 49 + learning outcome spreadsheet

Note: “bring logic, structure and trust to information” quoting CM 2.0 directly.

*Note taken from ACCO 659: Capstone II Examination Preparation. https://www.concordia.ca/jmsb/programs/graduate/cpa/program-details/curriculum.html

CPA 680 Leadership Competencies (3 cr)

In this course, students foster the acquired accountancy competencies in the topic areas of Ethical Decision-Making and Organizational Governance, Finance, Management Decision-Making, Strategy, Risk Management, and Innovation, as well as Value Creation. Using a case-based teaching approach, students refine their ethical mindset and advanced professional competencies to a higher proficiency level. Upon successful completion of the course, students are prepared to make, facilitate, communicate and implement performance-related decisions in a multitude of scenarios and contexts of higher ambiguity and complexity.

Prerequisite & note:

Prerequisite: CPA 676

Note: There will be a surcharge for this course.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 12 + 65 + learning outcome spreadsheet

*Note taken from ACCO 659: Capstone II Examination Preparation. https://www.concordia.ca/jmsb/programs/graduate/cpa/program-details/curriculum.html

CPA 681 Leadership Integration & Exam Preparation (3 cr)

In this course, students integrate and apply the previously acquired accountancy competencies in a decision context of higher ambiguity and complexity. Using a case-based teaching approach and exam simulations, students put to test in an undirected manner their ethical mindset and advanced professional competencies across all topic areas in a multitude of scenarios and contexts. By the end of the course, students are well equipped to use their developed competencies to tackle real-world challenges encountered by professional accountants. The course is designed specifically for students intending to write the CPA Professional Final Exam – Part 02 on the CPA Leadership.

Prerequisites & notes

Prerequisites: CPA 680 (concurrently, or previously)

Note: There will be a surcharge for this course.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 12 + 65 + learning outcome spreadsheet

*Note taken from ACCO 659: Capstone II Examination Preparation. https://www.concordia.ca/jmsb/programs/graduate/cpa/program-details/curriculum.html

CPA 682 Applied Professional Accounting II (3 cr)

In this course, students further enhance their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part II. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.

Prerequisites & notes

Prerequisite: CPA 676 (concurrently, or previously)

Note: This course is only available for students that did not receive credits for CPA 678.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 13

Assessments: Submitted work plan – part II and reflective interview or written report

CPA 683 Applied Professional Accounting III (1.5 cr)

In this course, students augment their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part III. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.

Prerequisites & notes

Prerequisite: CPA 676 (previously)

Note: This course is only available for students that did not receive credits for CPA 678.

FOLLOWING NOT IN COURSE DESCIRPTION

Reference for course description draft: CPA Academic Guide, p. 13

Assessments: Submitted work plan – part III and reflective interview or written report

Tutorial courses

- The proposal entails tutorial courses for the new CPA courses, following the logic of the current practice

- Tutorial courses are CPA 600 to CPA 613

CPA Program: Licensure versus Non-Licensure

Overall:

Program with licensure option:

27 course-credits for Licensure track

+ 3 credits for work experience or 3 credits value-adding electives beyond CPA-required training

= 30 credits Diploma program

Program without licensure option:

22.5 course-credits for Non-Licensure track

- Two options for students in non-licensure track:
  - Either graduate after completing 21 course-credits as Certificate in CPA
  - or continue:

    22.5 course-credits

    + Up to 7.5 credits for work experience (Applied Professional Accounting I + II + III)*

    = 30 credits Diploma program

*Possible to replace work experience with 600er elective courses

Summary (1/2)

- These changes lead to a redesigned program, consisting of
  - 2 Seminars (CPA 670 & 671)
  - 4 Subject Matter Courses (CPA 672, 673, 674, and 675)
  - 5 Exam Preparation Courses (CPA 676, 678, 679, 680, 681)
  - 1 Work Experience or Free-elective (CPA 677/CPA 682/CPA682 or 600er-level elective)

→ Propose a marketable program that conveys the message

"We invest heavily in your CPA exam preparation" (13.5 credits)

Summary (2/2)

- Structure:
  - Foundation & Core (CPA 670-675) [16.5 credits]
  - Capstone 1: Order Exam 1 (A+B) (CPA 667, 678, and 679) [7.5 credits for licensure track and 3 credits for non-licensure track]
  - Capstone 2: Order Exam 2 (CPA 679 and CPA 680) [6 credits]
  - Work Experience and/or Elective(s) (CPA 677 and CPA 682 or 600er-level elective) [3 for licensure track and 7.5 credits for non-licensure track]

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Summary of Changes (Graduate Program Regular Curriculum Change)

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
CPA 600 Tutorial in Foundational Seminars New	★	★	★	★	★	★	★	★	★	
CPA 601 Tutorial in Accounting Analytics & Artificial Intelligence New	★	★	★	★	★	★	★	★	★	
CPA 602 Tutorial in Financial Reporting Practices New	★	★	★	★	★	★	★	★	★	
CPA 603 Tutorial in Taxation New	★	★	★	★	★	★	★	★	★	
CPA 604 Tutorial in Compilations, Reviews & Audits New	★	★	★	★	★	★	★	★	★	
CPA 605 Tutorial in Financial & Non-Financial Reporting New	★	★	★	★	★	★	★	★	★	
CPA 606 Tutorial in Core Integration & Exam	★	★	★	★	★	★	★	★	★	

Preparation New										
CPA 607 Tutorial in Applied Professional Accounting I New	★	★	★	★	★	★	★	★	★	
CPA 608 Tutorial in Licensure Exam Preparation I New	★	★	★	★	★	★	★	★	★	
CPA 609 Tutorial in Licensure Exam Preparation II New	★	★	★	★	★	★	★	★	★	
CPA 610 Tutorial in Leadership Competencies New	★	★	★	★	★	★	★	★	★	
CPA 611 Tutorial in Leadership Integration & Exam Preparation New	★	★	★	★	★	★	★	★	★	
CPA 612 Tutorial in Applied Professional Accounting II New	★	★	★	★	★	★	★	★	★	
CPA 613 Tutorial in Applied Professional Accounting III New	★	★	★	★	★	★	★	★	★	
CPA 670 Foundational Seminars New	★	★	★	★			★	★	★	
CPA 671 Accounting Analytics & Artificial	★	★	★	★			★	★	★	

Intelligence New										
CPA 672 Financial Reporting Practices New	★	★	★	★	★		★	★	★	
CPA 673 Taxation New	★	★	★	★	★		★	★	★	
CPA 674 Compilations, Reviews & Audits New	★	★	★	★	★		★	★	★	
CPA 675 Financial & Non-Financial Reporting New	★	★	★	★	★		★	★	★	
CPA 676 Core Integration & Exam Preparation New	★	★	★	★	★	★	★	★	★	
CPA 677 Applied Professional Accounting I New	★	★	★	★	★	★	★	★	★	
CPA 678 Licensure Exam Preparation I New	★	★	★	★	★	★	★	★	★	
CPA 679 Licensure Exam Preparation II New	★	★	★	★	★	★	★	★	★	
CPA 680 Leadership Competencies New	★	★	★	★	★	★	★	★	★	
CPA 681 Leadership Integration & Exam Preparation New	★	★	★	★	★	★	★	★	★	
CPA 682	★	★	★	★	★	★	★	★	★	

Applied Professional Accounting II New										
CPA 683 Applied Professional Accounting III New	★	★	★	★	★	★	★	★	★	

Program Changes:

	Suspend Admissions	Program Degree Type Change	Program Title Change	Program Require-ments Change	Change to Program Type	Change to Total Credit Value of Program	Change to Primary Campus
Graduate Diploma in Chartered Professional Accountancy Change							

Regulation Changes:

- Additional Degree Requirements Change

PROGRAM CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: Graduate Diploma in Chartered Professional Accountancy
Calendar Section Type: Program
Description of Change: Graduate Diploma in Chartered Professional Accountancy Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy
Program Name: Graduate Diploma in Chartered Professional Accountancy
Program Type: Course-based
Degree: Graduate Diploma

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > John Molson School of Business Programs > Graduate Diploma > Chartered Professional Accountancy Graduate Diploma > Degree Requirements

Type of Change: Program Change

	Present Text calendar		**Proposed Text**
30 credits	Graduate Diploma in Chartered Professional Accountancy	**30 credits**	Graduate Diploma in Chartered Professional Accountancy
	~~8~~ credits: ~~Core I~~ Module		13.5 credits: Foundational Development & Core Module
	~~ACCO 650~~ Financial Reporting ~~in Practice (4)~~ ~~ACCO 651~~ Financial ~~Reporting: Comprehensive Applications (4)~~		CPA 670 Foundational Seminars (1.5) CPA 671 Accounting Analytics & Artificial Intelligence (1.5) CPA 672 Financial Reporting Practices (3) CPA 673 Taxation (3) CPA 674 Compilations, Reviews & Audits (3) CPA 675 Financial & Non-Financial Reporting (1.5)
	~~8 credits:~~ ~~Core II Module~~ ~~ACCO 652 Business Advisory Services (4)~~ ~~ACCO 653 Information Systems and Internal Control (4)~~		
	~~2~~ credits: Capstone I ~~Module~~ ~~ACCO 658 Capstone I Seminar (2)~~		3 credits: Capstone I - A Module: Core Common Preparation CPA 676 Core Integration & Exam Preparation (3)
	~~4 credits:~~ ~~Capstone II Module~~ ~~ACCO 659 Capstone II Examination~~ Preparation ~~(4)~~		3 credits of elective courses, chosen from: CPA 677 Applied Professional Accounting I (3) or any other additional and relevant 600-level ACCO, CPA or graduate-level course, subject to the approval by the Program Director.
	~~8~~ credits of ~~Elective Courses,~~ chosen from ~~two~~ of the following ~~four courses,~~ depending on ~~students'~~ interests and career aspirations:		4.5 credits chosen from one of the following two options, depending on students interests and career aspirations: Option 1: Capstone I-B Module: Licensure Preparation

Present Text calendar	Proposed Text
~~ACCO 654 Assurance and Professional Practice (4)~~ ~~ACCO 655 Taxation and Decision Making (4)~~ ~~ACCO 656 Performance Management (4)~~ ~~ACCO 657 Financial Strategies and Decisions (4)~~ ~~Students~~ who plan to practice public accounting must take ~~ACCO 654~~ and ~~ACCO 655~~ Note: In addition to the required diploma courses in the program, students may register for one or more tutorial courses, with the permission of the program director.	[Licensure Track] CPA 678 Licensure Exam Preparation I (1.5) CPA 679 Licensure Exam Preparation II (3) Stu dents who plan to practice public accounting must take CPA 678 and CPA 679 . Option 2: Applied Professional Accountancy CPA 682 Applied Professional Accounting II (3) CPA 683 Applied Professional Accounting III (1.5) Any other additional and relevant 600-level ACCO, CPA or graduate-level course, subject to the approval by the Program Director. 6 credits: Capstone II Module: Leadership Preparation CPA 680 Leadership Competencies (3) CPA 681 Leadership Integration & Exam Preparation (3) Note: In addition to the required diploma courses in the program, students may register for one or more tutorial courses, with the permission of the program director.

Rationale:

The mandated redesign of the Graduate Diploma in Chartered Professional Accountancy follows the requirement from the new CPA Competency Map 2.0 and accreditation regulations by the CPA Quebec Order and other relevant regulation. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:

The current Graduate Diploma in Chartered Professional Accountancy entails 30-course credits. The redesigned program encompasses up to 30 course-credits. The redesigned program will be delivered with the current faculty composite and requires up to 30 credits to be offered.

Students that choose the licensure track complete 27-course credits and have the option to earn 3 credits for qualifying work experience or take an elective course for up to 3 credits. Students that do not choose the licensure track complete 22.5-course credits and have the following options: either switch during their studies into the Graduate Certificate in Chartered Professional Accountancy, earn a total of 7.5 credits for qualifying work experience or take elective courses for up to 7.5 credits.

The current Graduate Diploma in Chartered Professional Accountancy requires 124 course credits per academic year to serve the three intakes of CPA Candidates. It is expected that the required total course credits per academic year under the redesigned Graduate Diploma in Chartered Professional Accountancy for the three intakes of CPA Candidates will range between 114 and 120 course credits. The reason for the reduction is that the redesigned program entails the option to earn 3 credits for qualifying work experience (Applied Work Experience course with deliverables and pass-and-fail assessment) as opposed to taking a lecture-based instructor-led course, reducing the number of teaching credits awarded in the redesigned Graduate Diploma. Furthermore, the current CPA certification program requires CPA candidates to choose among four elective depth roles [Assurance, Finance, Performance Management, and Tax] on the CPA Common Final Examination (CFE). The new CPA certification program only has the common CPA role and the additional CPA licensure role. This change reduces the number of elective courses that are currently offered in the CPA Graduate Diploma.

REGULATIONS CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: Additional Degree Requirements
Calendar Section Type: Regulation
Description of Change: Additional Degree Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Type of change: Regulation Change

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > John Molson School of Business Programs > Graduate Diploma > Chartered Professional Accountancy Graduate Diploma

Present Text calendar	Proposed Text
Additional Degree Requirements	Additional Degree Requirements
~~**Program** **Course** **Sequence.**~~ Students generally complete ~~Core I Module courses (ACCO 650 , ACCO 651) prior to taking Core II Module~~ courses ~~(ACCO 652 , ACCO 653).~~ Core ~~I~~ Module ~~courses must be completed~~ prior to taking ~~Core II~~ Module ~~courses. These four courses are usually followed by two elective courses from a choice of four (ACCO 654 , ACCO 655 , ACCO 656 , ACCO 657).~~ ~~Students~~ who wish to pursue their career in Public Accountancy must ~~take ACCO 654~~ and ~~ACCO 655 .~~ Upon completion of the ~~six courses, all candidates are required to complete~~ the ~~two~~ Capstone ~~courses ACCO 658~~ and ~~ACCO 659 .~~ ~~**MBA Option.** Students in good academic standing who meet~~ the ~~admission requirements~~ of the ~~MBA program,~~ and ~~who have completed~~ the ~~requirements for~~ the ~~Diploma in Chartered Professional Accountancy program, may be granted advanced standing upon admission to~~ the ~~MBA program. Please refer to~~ the ~~Master~~ of ~~Business Administration (MBA) section for more details.~~	Program Course Sequence. Students generally complete the courses (CPA 670, CPA 671, CPA 672, CPA 673, CPA 674, and CPA 675) of the Foundational Development & Core Module prior to taking the Capstone I-A Module (CPA 676). Students who wish to pursue their career in Public Accountancy must complete the Capstone I-B Module (CPA 678 and CPA 679). Upon completion of the Capstone I-A Module (CPA 676), students can enter the Capstone II Module (CPA 680 and CPA 681). CPA 670, CPA 672, part of CPA 673, part of CPA 674, and part of CPA 675 fulfill the CPA competencies of the Foundational Development level. CPA 671, part of CPA 673, part of CPA 674, part of CPA 675, and CPA 676 fulfill the CPA competencies of the CPA Core – Common level. CPA 678 and CPA 679 fulfill the CPA competencies of the CPA Core – Licensure level. CPA 680 and CPA 681 fulfill the CPA competencies of the CPA Leadership level.

Rationale:
The mandated redesign of the Graduate Diploma in Chartered Professional Accountancy follows the requirement from the new CPA Competency Map 2.0 and accreditation regulations by the CPA Quebec Order and other relevant regulation. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
The current Graduate Diploma in Chartered Professional Accountancy entails 30-course credits. The redesigned program encompasses up to 30 course-credits. The redesigned program will be delivered with the current faculty composite and requires up to 30 credits to be offered.

Students that choose the licensure track complete 27-course credits and have the option to earn 3 credits for qualifying work experience or

take an elective course for up to 3 credits. Students that do not choose the licensure track complete 22.5-course credits and have the following options: either switch during their studies into the Graduate Certificate in Chartered Professional Accountancy, earn a total of 7.5 credits for qualifying work experience or take elective courses for up to 7.5 credits.

The current Graduate Diploma in Chartered Professional Accountancy requires 124 course credits per academic year to serve the three intakes of CPA Candidates. It is expected that the required total course credits per academic year under the redesigned Graduate Diploma in Chartered Professional Accountancy for the three intakes of CPA Candidates will range between 114 and 120 course credits. The reason for the reduction is that the redesigned program entails the option to earn 3 credits for qualifying work experience (Applied Work Experience course with deliverables and pass-and-fail assessment) as opposed to taking a lecture-based instructor-led course, reducing the number of teaching credits awarded in the redesigned Graduate Diploma. Furthermore, the current CPA certification program requires CPA candidates to choose among four elective depth roles [Assurnace, Finance, Performance Management, and Tax] on the CPA Common Final Examination (CFE). The new CPA certification program only has the common CPA role and the additional CPA licensure role. This change reduces the number of elective courses that are currently offered in the CPA Graduate Diploma.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 600
Calendar Section Type: Course
Description of Change: CPA 600 Tutorial in Foundational Seminars
New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 600 Tutorial in Foundational Seminars (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 670 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 670 . This course consists of two foundational seminars designed to introduce students to the ethical, strategic, and performance dimensions of the accounting profession. The first seminar addresses the topic areas of Ethical Decision-Making, Organizational Governance, and Sustainability. The second seminar focuses on the topic areas of Finance, Management Decision-Making, Strategy, Risk Management and Innovation as well as Value Creation. Students use case-based learning in both seminars. Upon successful completion of the seminars, students are able to integrate foundational accountancy competencies across a range of decision-making contexts, demonstrating awareness of the ethical and professional implications inherent in their judgments
Component(s):	*Component(s):* Seminar
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have taken this course topic under CPA 670 may not take this course for credit.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 670 in the term the course is taken.

D5

Rationale:

The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 601
Calendar Section Type: Course
Description of Change: CPA 601 Tutorial in Accounting Analytics & Artificial Intelligence New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 601 Tutorial in Accounting Analytics & Artificial Intelligence (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 671 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 671. In this workshop, students acquire competencies in data analytics, data governance, the use of artificial intelligence, and other technologies relevant for assurance, business advisory, and industry mandates of professional accountants. Using an applied teaching approach, students use technology to analyze and assess a multitude of decision scenarios and contexts, supporting their development of the advanced professional competencies as well as the specific accountancy competencies in Big Data and Data Analytics, Data Governance, as well as in Management Decision-Making and Information Systems/Technology. Upon successful completion of the workshop seminar, students know how to integrate technology into the diverse work portfolio of professional accountants.
Component(s):	*Component(s):* Workshop
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 671 may not take this course for credit.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 671 in the term the course is taken.

Rationale:

The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 602
Calendar Section Type: Course
Description of Change: CPA 602 Tutorial in Financial Reporting Practices New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 602 Tutorial in Financial Reporting Practices (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 672 . Permission of the program director is required .
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 672. In this course, students obtain core competencies in financial reporting for routine transactions of many financial accounting and reporting issues at a low to moderate level of complexity. Using a case-based teaching approach, students apply appropriate accounting treatment, using alternative accounting frameworks. By the end of the course, students are equipped to make routine financial reporting decisions, using an ethical mindset and the advanced professional competencies.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 672 may not take this course for credit.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 672 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:
No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 603
Calendar Section Type: Course
Description of Change: CPA 603 Tutorial in Taxation New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 603 Tutorial in Taxation (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 673 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 673. In this course, students develop core competencies in taxation. Using a case-based teaching approach, students apply appropriate tax treatment in compliance with tax laws and regulations for a broad range of routine tax events or transactions and tax planning at a low to moderate complexity. Upon successful completion of the course, students are capable to address routine taxation issues, using an ethical mindset and the advanced professional competencies.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 673 may not take this course for credit.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 673 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:
No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 604
Calendar Section Type: Course
Description of Change: CPA 604 Tutorial in Compilations, Reviews & Audits New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 604 Tutorial in Compilations, Reviews & Audits (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 674 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 674. In this course, students obtain core competencies in compilations, reviews, and audits of historical financial information. Using a variety of teaching methods that focus on a case-based teaching approach, students apply appropriate standards with an ethical mindset to these projects. Upon successful completion of this course, students are trained to perform compilations, reviews, and audits of historical financial information that serves the public interest.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 674 may not take this course for credit.
Other note :	**Other note :** T his course is evaluated on the same basis as CPA 674 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:
No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 605
Calendar Section Type: Course
Description of Change: CPA 605 Tutorial in Financial & Non-Financial Reporting New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 605 Tutorial in Financial & Non-Financial Reporting (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 675 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 675. In this course, students develop core accountancy competencies in financial and non-financial reporting at a low to moderate complexity. Using a case-based teaching approach, students apply the advanced professional competencies in making financial and non-financial reporting decisions. By the end of the course, students are prepared to analyze the appropriateness of financial and non-financial reporting options in diverse decision scenarios and contexts.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 675 may not take this course for credit.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 675 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:
No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 606
Calendar Section Type: Course
Description of Change: CPA 606 Tutorial in Core Integration & Exam Preparation New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 606 Tutorial in Core Integration & Exam Preparation (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 676 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 676 In this course, students integrate and enhance the previously acquired accountancy competencies to apply them to performance-related decisions in a multitude of scenarios and contexts at increased levels of proficiency. Using exam simulations, the course is designed specifically for students writing the CPA Professional Final Exam – Part 01 on the CPA Core – Common.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 676 may not take this course for credit.
Fee note :	**Fee note :** There is a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 676 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:
No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 607
Calendar Section Type: Course
Description of Change: CPA 607 Tutorial in Applied Professional Accounting I New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 607 Tutorial in Applied Professional Accounting I (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 677 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 677. In this course, students enhance their professional accounting competencies through acquiring three months of qualifying work experience in accountancy. During the course, students submit their professional accounting work plan. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.
Component(s):	*Component(s):* Fieldwork
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 677 may not take this course for credit.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 677 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 608
Calendar Section Type: Course
Description of Change: CPA 608 Tutorial in Licensure Exam Preparation I New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 608 Tutorial in Licensure Exam Preparation I (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 678 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 678. In this course, students integrate and foster the previously acquired accountancy competencies to apply them to taxation projects in a multitude of scenarios and contexts at increased levels of proficiency. The course is designed specifically to cover additional taxation and integration topics relevant for licensure projects. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 678 may not take this course for credit.
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 678 in the term the course is taken. This course is required for students in the licensure track.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 609
Calendar Section Type: Course
Description of Change: CPA 609 Tutorial in Licensure Exam Preparation II New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 609 Tutorial in Licensure Exam Preparation II (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 679 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 679. In this course, students obtain core competencies in performing licensure projects that fall within and outside the scope of the CPA Canada Handbook - Assurance. Using a case-based teaching approach, students apply appropriate methodology and an ethical mindset to diverse assurance and trust engagements. The course is further designed to cover additional financial reporting and integration topics relevant for licensure projects. By the end of the course, students know how to bring logic, structure and trust to information to protect the public and act in the public interest. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 679 may not take this course for credit.
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 679 in the term the course is taken. This course is required for students in the licensure track.

Rationale:

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The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 610
Calendar Section Type: Course
Description of Change: CPA 610 Tutorial in Leadership Competencies New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 610 Tutorial in Leadership Competencies (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 680 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 680. In this course, students foster the acquired accountancy competencies in the topic areas of Ethical Decision-Making and Organizational Governance, Finance, Management Decision-Making, Strategy, Risk Management, and Innovation, as well as Value Creation. Using a case-based teaching approach, students refine their ethical mindset and advanced professional competencies to a higher proficiency level. Upon successful completion of the course, students are prepared to make, facilitate, communicate and implement performance-related decisions in a multitude of scenarios and contexts of higher ambiguity and complexity.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 680 may not take this course for credit.
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 680 in the term the course is taken.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 611
Calendar Section Type: Course
Description of Change: CPA 611 Tutorial in Leadership Integration & Exam Preparation New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 611 Tutorial in Leadership Integration & Exam Preparation (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 681 . Permission of the program director is required .
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 681. In this course, students integrate and apply the previously acquired accountancy competencies in a decision context of higher ambiguity and complexity. Using a case-based teaching approach and exam simulations, students put to test in an undirected manner their ethical mindset and advanced professional competencies across all topic areas in a multitude of scenarios and contexts. By the end of the course, students are well equipped to use their developed competencies to tackle real-world challenges encountered by professional accountants. The course is designed specifically for students intending to write the CPA Professional Final Exam – Part 02 on the CPA Leadership.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit of this topic under CPA 681 may not take this course for credit.
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 681 in the term the course is taken.

Rationale:

The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 612
Calendar Section Type: Course
Description of Change: CPA 612 Tutorial in Applied Professional Accounting II New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 612 Tutorial in Applied Professional Accounting II (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 682 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 682. In this course, students further enhance their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part II. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.
Component(s):	*Component(s):* Fieldwork
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 682 may not take this course for credit.
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 682 in the term the course is taken. This course is only available for students that did not receive credits for CPA 678 .

Rationale:

The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:

No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 613
Calendar Section Type: Course
Description of Change: CPA 613 Tutorial in Applied Professional Accounting III New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Tutorial Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 613 Tutorial in Applied Professional Accounting III (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 683 . Permission of the program director is required.
Description :	*Description :* This course is designed to enhance the competencies of students in the program who will benefit from additional exposure to the subject matter covered in CPA 683. In this course, students augment their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part III. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.
Component(s):	*Component(s):* Fieldwork
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for this topic under CPA 683 may not take this course for credit.
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is evaluated on the same basis as CPA 683 in the term the course is taken. This course is only available for students that did not receive credits

Present Text calendar	Proposed Text
	for CPA 678.

Rationale:
The current program also has a tutorial course for each program course in case students need to repeat a certain CPA course. It follows, therefore, the same practice as the current program.

Resource Implications:
No resource implication as tutorial courses are cross-listed with the main CPA course.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 670
Calendar Section Type: Course
Description of Change: CPA 670 Foundational Seminars New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 670 Foundational Seminars (1.5 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
	This course consists of two foundational seminars designed to introduce students to the ethical, strategic, and performance dimensions of the accounting profession. The first seminar addresses the topic areas of Ethical Decision-Making, Organizational Governance, and Sustainability. The second seminar focuses on the topic areas of Finance, Management Decision-Making, Strategy, Risk Management and Innovation as well as Value Creation. Students use case-based learning in both seminars. Upon successful completion of the seminars, students are able to integrate foundational accountancy competencies across a range of decision-making contexts, demonstrating awareness of the ethical and professional implications inherent in their judgments.
Component(s):	*Component(s):*
	Seminar
Notes :	*Notes :*

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 671
Calendar Section Type: Course
Description of Change: CPA 671 Accounting Analytics & Artificial Intelligence New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 671 Accounting Analytics & Artificial Intelligence (1.5 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* In this workshop, students acquire competencies in data analytics, data governance, the use of artificial intelligence, and other technologies relevant for assurance, business advisory, and industry mandates of professional accountants. Using an applied teaching approach, students use technology to analyze and assess a multitude of decision scenarios and contexts, supporting their development of the advanced professional competencies as well as the specific accountancy competencies in Big Data and Data Analytics, Data Governance, as well as in Management Decision-Making and Information Systems/Technology. Upon successful completion of the workshop seminar, students know how to integrate technology into the diverse work portfolio of professional accountants.
Component(s):	*Component(s):* Workshop
Notes :	*Notes :*

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 672
Calendar Section Type: Course
Description of Change: CPA 672 Financial Reporting Practices New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 672 Financial Reporting Practices (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 670 . The following courses must be completed previously or concurrently: CPA 671 .
Description :	*Description :* In this course, students obtain core competencies in financial reporting for routine transactions of many financial accounting and reporting issues at a low to moderate level of complexity. Using a case-based teaching approach, students apply appropriate accounting treatment, using alternative accounting frameworks. By the end of the course, students are equipped to make routine financial reporting decisions, using an ethical mindset and the advanced professional competencies.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 673
Calendar Section Type: Course
Description of Change: CPA 673 Taxation New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 673 Taxation (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 670 . The following courses must be completed previously or concurrently: CPA 671 , CPA 672 .
Description :	*Description :* In this course, students develop core competencies in taxation. Using a case-based teaching approach, students apply appropriate tax treatment in compliance with tax laws and regulations for a broad range of routine tax events or transactions and tax planning at a low to moderate complexity. Upon successful completion of the course, students are capable to address routine taxation issues, using an ethical mindset and the advanced professional competencies.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 674
Calendar Section Type: Course
Description of Change: CPA 674 Compilations, Reviews & Audits
New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 674 Compilations, Reviews & Audits (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 672 .
Description :	*Description :* In this course, students obtain core competencies in compilations, reviews, and audits of historical financial information. Using a variety of teaching methods that focus on a case-based teaching approach, students apply appropriate standards with an ethical mindset to these projects. Upon successful completion of this course, students are trained to perform compilations, reviews, and audits of historical financial information that serves the public interest.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 675
Calendar Section Type: Course
Description of Change: CPA 675 Financial & Non-Financial Reporting New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 675 Financial & Non-Financial Reporting (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously or concurrently: CPA 672 .
Description :	*Description :* In this course, students develop core accountancy competencies in financial and non-financial reporting at a low to moderate complexity. Using a case-based teaching approach, students apply the advanced professional competencies in making financial and non-financial reporting decisions. By the end of the course, students are prepared to analyze the appropriateness of financial and non-financial reporting options in diverse decision scenarios and contexts.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 676
Calendar Section Type: Course
Description of Change: CPA 676 Core Integration & Exam Preparation New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 676 Core Integration & Exam Preparation (3 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: CPA 673 , CPA 674 and CPA 675 .
Description :	*Description :* In this course, students integrate and enhance the previously acquired accountancy competencies to apply them to performance-related decisions in a multitude of scenarios and contexts at increased levels of proficiency. Using exam simulations, the course is designed specifically for students writing the CPA Professional Final Exam – Part 01 on the CPA Core – Common.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Fee note :	**Fee note :** There will be a surcharge for this course.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 677
Calendar Section Type: Course
Description of Change: CPA 677 Applied Professional Accounting I
New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Elective Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 677 Applied Professional Accounting I (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously or concurrently: CPA 670 .
Description :	*Description :* In this course, students enhance their professional accounting competencies through acquiring three months of qualifying work experience in accountancy. During the course, students submit their professional accounting work plan. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.
Component(s):	*Component(s):* Fieldwork (Applied Work Experience)
Notes :	*Notes :*
Non-standard assessment note :	**Non-standard assessment note :** This course is graded on a pass/fail basis.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 678
Calendar Section Type: Course
Description of Change: CPA 678 Licensure Exam Preparation I New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Elective Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 678 Licensure Exam Preparation I (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously or concurrently: CPA 676 .
Description :	*Description :* In this course, students integrate and foster the previously acquired accountancy competencies to apply them to taxation projects in a multitude of scenarios and contexts at increased levels of proficiency. The course is designed specifically to cover additional taxation and integration topics relevant for licensure projects. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is required for students in the licensure track.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 679
Calendar Section Type: Course
Description of Change: CPA 679 Licensure Exam Preparation II New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Elective Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 679 Licensure Exam Preparation II (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously or concurrently: CPA 678 .
Description :	*Description :*
	In this course, students obtain core competencies in performing licensure projects that fall within and outside the scope of the CPA Canada Handbook - Assurance. Using a case-based teaching approach, students apply appropriate methodology and an ethical mindset to diverse assurance and trust engagements. The course is further designed to cover additional financial reporting and integration topics relevant for licensure projects. By the end of the course, students know how to bring logic, structure and trust to information to protect the public and act in the public interest. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.
Component(s):	*Component(s):*
	Lecture
Notes :	*Notes :*
Fee note :	**Fee note :** There will be a surcharge for this course.
Other note :	**Other note :** This course is required for students in the licensure track.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 680
Calendar Section Type: Course
Description of Change: CPA 680 Leadership Competencies New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 680 Leadership Competencies (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: CPA 676 .
Description :	*Description :*
	In this course, students foster the acquired accountancy competencies in the topic areas of Ethical Decision-Making and Organizational Governance, Finance, Management Decision-Making, Strategy, Risk Management, and Innovation, as well as Value Creation. Using a case-based teaching approach, students refine their ethical mindset and advanced professional competencies to a higher proficiency level. Upon successful completion of the course, students are prepared to make, facilitate, communicate and implement performance-related decisions in a multitude of scenarios and contexts of higher ambiguity and complexity.
Component(s):	*Component(s):*
	Lecture
Notes :	*Notes :*
Fee note :	**Fee note :** There will be a surcharge for this course.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 681
Calendar Section Type: Course
Description of Change: CPA 681 Leadership Integration & Exam Preparation New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Required Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 681 Leadership Integration & Exam Preparation (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously or concurrently: CPA 680 .
Description :	*Description :* I n this course, students integrate and apply the previously acquired accountancy competencies in a decision context of higher ambiguity and complexity. Using a case-based teaching approach and exam simulations, students put to test in an undirected manner their ethical mindset and advanced professional competencies across all topic areas in a multitude of scenarios and contexts. By the end of the course, students are well equipped to use their developed competencies to tackle real-world challenges encountered by professional accountants. The course is designed specifically for students intending to write the CPA Professional Final Exam – Part 02 on the CPA Leadership.
Component(s):	*Component(s):* Lecture
Notes :	*Notes :*
Fee note :	**Fee note :** There will be a surcharge for this course.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 682
Calendar Section Type: Course
Description of Change: CPA 682 Applied Professional Accounting II
New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Elective Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 682 Applied Professional Accounting II (3 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously or concurrently: CPA 676 .
Description :	*Description :* In this course, students further enhance their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part II. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.
Component(s):	*Component(s):* Fieldwork (Applied Work Experience)
Notes :	*Notes :*
Other note :	**Other note :** This course is only available for students that did not receive credits for CPA 678 .
Non-standard assessment note :	**Non-standard assessment note :** This course is graded on a pass/fail basis.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

COURSE CHANGE FORM

Dossier Type: Graduate Program Regular Curriculum Change
Dossier Title: CPA - Redesigned Diploma

Calendar Section Name: CPA 683
Calendar Section Type: Course
Description of Change: CPA 683 Applied Professional Accounting III New

Proposed: Graduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Diploma in Chartered Professional Accountancy

Calendar publication date: 2026/2027/Fall
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > John Molson School of Business Courses > Graduate Certificate and Diploma Courses > Chartered Professional Accountancy Graduate Diploma Courses > Chartered Professional Accountancy Elective Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	CPA 683 Applied Professional Accounting III (1.5 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: CPA 676 .
Description :	*Description :* I n this course, students augment their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part III. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.
Component(s):	*Component(s):* Fieldwork (Applied Work Experience)
Notes :	*Notes :*
Other note :	**Other note :** This course is only available for students that did not receive credits for CPA 678 .
Non-standard assessment note :	**Non-standard assessment note :** This course is graded on a pass/fail basis.

Rationale:
This new course is part of the mandated redesign of the Graduate Diploma in Chartered Professional Accountancy in order to obtain program accreditation by the CPA Quebec Order. The redesigned program is planned to be launched in winter term 2027.

Resource Implications:
Please refer to the Program Change Form for Graduate Diploma in Chartered Professional Accountancy.

Impact Report

Courses

CPA 670 Foundational Seminars New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 671 Accounting Analytics & Artificial Intelligence New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 672 Financial Reporting Practices New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 673 Taxation New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 674 Compilations, Reviews & Audits New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 675 Financial & Non-Financial Reporting New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 676 Core Integration & Exam Preparation New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 677 Applied Professional Accounting I New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Elective Courses
Source of Impact

CPA 678 Licensure Exam Preparation I New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses ->

Chartered Professional Accountancy Elective Courses
Source of Impact

CPA 679 Licensure Exam Preparation II New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Elective Courses
Source of Impact

CPA 680 Leadership Competencies New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 681 Leadership Integration & Exam Preparation New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Required Courses
Source of Impact

CPA 682 Applied Professional Accounting II New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Elective Courses
Source of Impact

CPA 683 Applied Professional Accounting III New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> John Molson School of Business Courses -> Graduate Certificate and Diploma Courses -> Chartered Professional Accountancy Graduate Diploma Courses -> Chartered Professional Accountancy Elective Courses
Source of Impact

Other Units

Addition of **CPA 672** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 673** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 675** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 670** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 671** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 674** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 676** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 677** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 679** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 680** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 678** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 681** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 682** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

Addition of **CPA 683** to **Chartered Professional Accountancy Graduate Diploma** requirement
Source of other unit Impact

- Course is housed in Chartered Professional Accountancy Graduate Diploma Courses

INTERNAL MEMORANDUM

To: Dr. Sandra Betton, Associate Dean Professional Graduate Programs

From: Dr. Matthäus Tekathen, Chair, Department of Accountancy

Date: December 10, 2025

Subject: Mandated Redesign of the Graduate Diploma in Chartered Professional Accountancy and related programs and courses

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Members of the Department of Accountancy approved the recommendations of the CPA Program Committee regarding the mandated changes to the Graduate Diploma in Chartered Professional Accountancy (CPA), the proposed creation of the Graduate Certificate in Chartered Professional Accountancy (CPA), and the changes to associated programs and courses.

The department met on November 26, 2025 to discuss the proposed redesign in light of the new certification requirements for CPA candidates and the new accreditation requirements for university-level graduate CPA programs by the CPA Quebec Order. The proposed changes follow the competency requirements to meet the CPA educational graduate-level requirements as well as the specific accreditation requirements from the CPA Quebec Order.

The CPA Program Committee discussed the proposed changes before and approved them on November 17, 2025.

Concordia University offers the second largest university graduate CPA program in Quebec, known for its high-quality CPA training and strong success rate at the national CPA Common Final Examinations (CFE). The proposed changes are necessary to obtain program accreditation by the CPA Quebec Order in Fall Term 2026. This way Concordia University will be allowed to offer a redesigned CPA graduate program as of Winter Term 2027.

Please find the relevant documents attached.

I respectfully request that the proposed changes be submitted to the next Faculty Academic Programs Committee meeting.

Best regards,

M. Tekathen

Matthäus Tekathen, Department Chair, Accountancy

Attachment – Table of Contents – Approval Package

01. Program Presentation
02. Program Change Forms
03. Course Change Forms
    03.01 Courses
    03.02 Tutorial Courses
04. High-Level Course Summaries
05. Additional Information (e.g., CPA Competency Map 2.0)

High-Level Course Summary

Course Title:

CPA 670 Foundational Seminars (1.5 cr)

Course Description

This course consists of two foundational seminars designed to introduce students to the ethical, strategic, and performance dimensions of the accounting profession. The first seminar addresses the topic areas of Ethical Decision-Making, Organizational Governance, and Sustainability. The second seminar focuses on the topic areas of Finance, Management Decision-Making, Strategy, Risk Management and Innovation as well as Value Creation. Students use case-based learning in both seminars. Upon successful completion of the seminars, students are able to integrate foundational accountancy competencies across a range of decision-making contexts, demonstrating awareness of the ethical and professional implications inherent in their judgments.

Course Prerequisite:

None

Learning objectives:

- Apply an ethical mindset to determine the ethical implications of actions and decisions and analyze the effectiveness of governance structures.
- Apply key sustainability concepts to decision-making contexts, including Environmental, Social, and Governance (ESG), Equity, Diversity, and Inclusion (EDI), planetary boundaries, indigenous perspectives, and relevant regulations.
- Analyze resource allocation and performance-related decisions, using key strategic, managerial accounting and finance concepts.

Progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of Foundational Development:

- III. Ethical Decision-Making and Organizational Govern./Data Governance
- IV. Finance
- VI. Management Decision-Making and Information Systems/Technology
- VIII. Strategy, Risk Management and Innovation
- X. Value Creation

High-level session plan

Session	Topic
1	Introduction to the CPA Ethical Mindset Key concepts in Ethics, Governance and Sustainability
2	Continuation of Ethics, Governance and Sustainability with applied cases
3	Introduction to the CPA Advanced Professional Competencies Strategy and Management Decision-Making with an applied case
4	Performance Management and Value Creation with an applied case
5	Capital Budgeting Decisions with an applied case
6	Finance, including Business Valuation with an applied case
	Final Exam

Assessment

- Three Multiple-Choice Assignments (30%)
- Midterm (30%) (case-based between 30 and 75 minutes)
- Final Exam (40%) (approximately 1.5 hours, consisting of case and multiple-choice questions)

Additional Resource:

The seminar time focuses on applying the specific competencies in the areas mentioned in the course description. Learning resources outside of the class time will be prepared/provided to refresh the specific competencies covered in this course (e.g., content refresher videos and readings).

Course Champions

Sabrina Lairy

Potential teaching faculty

Jon Graham, Derrick Gut, Sabrina Lairy, Giuseppe Maselli, Eva Lagou

High-Level Course Summary

Course Title:

CPA 671 Accounting Analytics & Artificial Intelligence (1.5 cr)

Course Description

In this workshop, students acquire competencies in data analytics, data governance, the use of artificial intelligence, and other technologies relevant for assurance, business advisory, and industry mandates of professional accountants. Using an applied teaching approach, students use technology to analyze and assess a multitude of decision scenarios and contexts, supporting their development of the advanced professional competencies as well as the specific accountancy competencies in Big Data and Data Analytics, Data Governance, as well as in Management Decision-Making and Information Systems/Technology. Upon successful completion of the workshop seminar, students know how to integrate technology into the diverse work portfolio of professional accountants.

Course Prerequisite:

None

Learning objectives:

- Analyze information technology solutions, including AI-based solutions, to enhance management decision-making and their effectiveness in supporting an entity's strategic
- Analyze the effectiveness of data governance policies, procedures, and processes
- Apply data analytics to prepare and analyse different decision contexts of professional accountants in order determine and communicate the decisions made
- Apply an ethical mindset, including professional scepticism when using or relying on information technology, including AI-based solutions

Progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of Foundational Development:

- II. Big Data and Data Analytics
- III. Ethical Decision-Making and Organizational Governance/Data Governance

High-level session plan

Session	Topic
1	Introduction to Information Systems/Technology and Data Governance Effectiveness of Data Governance Policies, Procedures & Processes Class case exercise 1
2	Applied Introduction to Data Analytics Hands-on Workshop Session (Class case exercise 2)
3	Automation in Accounting: Use Cases Walk-Through AI application in Accounting: Use Cases Walk-Through
4	Data Analytics and AI-based Solutions for Decision-Making: Application to Management Decision-Making, Strategy & Finance Class case exercise 3
5	Data Analytics and AI-based Solutions for Decision-Making: Application to Assurance Class case exercise 4
6	Data Analytics and AI-based Solutions for Decision-Making: Application to Financial Reporting and Taxation Class case exercise 5
	Final Exam

Assessment

- Participation: Class case exercises (25%)
- Applied Project (35%)
- Final Exam (40%) (approximately 1.5 hours, consisting of short cases on data governance, data analytics, and AI-based solutions)

Potential teaching faculty

Jack Martin, Li Yao

High-Level Course Summary for CPA 672, CPA 675, and CPA 676

A. Course Descriptions

A.1 CPA 672

Course Title:

Financial Reporting Practices (3 cr)

Course Description

In this course, students obtain core competencies in financial reporting for routine transactions of many financial accounting and reporting issues at a low to moderate level of complexity. Using a case-based teaching approach, students apply appropriate accounting treatment, using alternative accounting frameworks. By the end of the course, students are equipped to make routine financial reporting decisions, using an ethical mindset and the advanced professional competencies.

Course Prerequisites:

ACCO 670 (previously), ACCO 671 (previously, or concurrently)

Learning objectives:

- Apply appropriate financial reporting standards for routine transactions at a low to moderate complexity under IFRS and ASPE
- Analyze measurement results of routine transactions, with professional skepticism, to determine technical validity and precision
- Analyze the financial statements to facilitate decision-making

Progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of Foundational Development:

- V. Financial Reporting

A.2 CPA 675

Course Title:

Financial & Non-Financial Reporting (1.5 cr)

Course Description

In this course, students develop core accountancy competencies in financial and non-financial reporting at a low to moderate complexity. Using a case-based teaching approach, students apply the advanced professional competencies in making financial and non-financial reporting decisions. By the end of the course, students are prepared to analyze the appropriateness of financial and non-financial reporting options in diverse decision scenarios and contexts.

Course Prerequisites:

ACCO 672 (previously, or concurrently)

Learning objectives:

- Critically evaluate actions and decisions for accounting treatment, using an ethical mindset and advanced professional competencies
- Apply appropriate accounting treatment for routine transactions as well as business combinations and consolidations at a low to moderate complexity under IFRS and ASPE.
- Apply appropriate accounting standards for Not-for-Profit Organizations for routine transactions at a low to moderate complexity
- Analyze the applicability and appropriateness of reporting options, including sustainability reporting frameworks (e.g., GRI, SASB, ISSB), to meet organizational and interested-party needs

Progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of Foundational Development:

- V. Financial Reporting
- VII. Non-Financial Reporting

A.3 CPA 676

Course Title:

Core Integration & Exam Preparation (3 cr)

Course Description

In this course, students integrate and enhance the previously acquired accountancy competencies to apply them to performance-related decisions in a multitude of scenarios and contexts at increased levels of proficiency. Using exam simulations, the course is designed specifically for students writing the CPA Professional Final Exam – Part 01 on the CPA Core – Common.

Course Prerequisites & Notes:

Prerequisites: ACCO 673, 674 and 675

There will be a surcharge for this course.

Learning objectives:

- Apply advanced professional competencies and an ethical mindset in making, facilitating, communicating and implementing performance-related decisions in a multitude of scenarios and contexts at increased levels of proficiency
- Apply the previously acquired accountancy competencies with an emphasis on financial reporting, non-financial reporting, assurance, and data analytics
- Integrate the applicable competencies and relevant topic areas to case facts with increasing complexity and proficiency.

The integration focuses, in particular, on the following competencies as per CPA CM 2.0 and Academic Guide:

- I. Assurance and Trust
- II. Big Data and Data Analytics
- V. Financial Reporting
- VII. Non-Financial Reporting
- IX. Tax

B. High-level session plans and assessments for CPA 672, CPA 675, and CPA 676

B.1 CPA 672 Financial Reporting Practices (3 credits, 12 sessions)

Session	Topic – Proposal A	Topic – Proposal B
1	IAS 1 – presentation of financial statements, Conceptual Framework for Financial Reporting *Case writing techniques and best practices* *Case + debrief*	IAS 1 – presentation of financial statements and Conceptual Framework for Financial Reporting *Case writing techniques and best practices (Financial Reporting perspective)*
2	Inventory, Interim Reporting, Cashflow Statement CPA case writing techniques and best practices- Ethical Mindset Case + debrief	Revenue IFRS *Case writing techniques (Revenue Recognition focus)*
3	Property, Plant and Equipment non-monetary transactions Case + debrief	Revenue ASPE *Case writing techniques (Revenue Recognition focus)*
4	Goodwill and intangibles **Quiz 1 – 10%** Case + debrief	Inventory Property, Plant, and Equipment Govt' Assistance/Grants *Case writing techniques (Asset focus)*
5	Government grant Impairment of long-term assets Case + debrief	Intangible Assets Impairment of long-term assets
6	**Midterm Debrief**	Non-Monetary Transactions

		Related Party Transactions- ASPE point of view *(any catch up from lesson 1-5 if necessary)* *Case writing techniques (Asset focus)*
7	Revenue IFRS Case + debrief	**Midterm and debrief**
8	IFRS Common Issues – Appendix B *Revenue Recognition comprehensive cases + debrief*	Financial liabilities (including provisions, asset retirement obligations and contingencies) [TBD if includes amortized cost, debt/equity]
9	Revenue ASPE Specific topics for private entities **Quiz 2 – 10%** Case + debrief	Leases (from the lessee's perspective)- *with example and case writing*
10	Financial liabilities -including provisions, asset retirement obligations and contingencies Case + debrief	Taxes (income, deferred and GST considerations) Foreign Currency transactions of the entity *(any catch up from lesson 7 if necessary)* *Case writing techniques (Liability focus)*
11	Taxes – current and deferred GST consideration subsequent events Case + debrief	Subsequent Events Accounting Policy Changes, Corrections and Errors Interim Reporting
12	Acco. policy changes, corrections and errors *Comprehensive Topic review* ***Quiz 3 – 10%***	*Topic review*
	Final Exam	Final Exam

Assessment CPA 672

- 3 Multiple Choice Quizzes (30%)
- Midterm (30%)
- Final Exam (40%)

B.2 CPA 675 Non-Financial & Financial Reporting (1.5 credits, 6 sessions)

Session	Topic – Proposal A	Topic – Proposal B
1	Passive investments (financial instrument EPS (basic) Related party transactions	Introduction to Passive investments, financial instruments, and control Investment with significant influence
2	Investment with significant influence Part A – Routine business combinations and consolidations	Part A – Routine business combinations and consolidations
3	Part B – Routine business combinations and consolidations	Part B – Routine business combinations and consolidations
4	Part C – Routine business combinations and consolidations	Part C – Routine business combinations and consolidations
5	Not-for-Profit organization	Not-for-Profit organization
6	Non-financial reporting, including Sustainability Reporting	Non-financial reporting, including Sustainability Reporting
	Final Exam	Final Exam

Part A entails:

- Introduction to business combinations (the act of gaining control)
- Consideration transferred, fair value of identifiable net assets acquired, calculation of goodwill, discussion of goodwill
- Business combinations achieved in two ways (acquisition of net assets and shares)
- Go into detail about acquisition of net assets versus a PPE acquisition
- Do case example

Part B entails:

- Business combination with acquisition of shares
- Consolidation on day of acquisition
- Do case example

Part C entails:

- Consolidation post acquisition
- Other impacts - intragroup (very low detail), NCI (very low detail)
- Do case example

Assessment CPA 675

- 3 Multiple Choice Quizzes (30%)
- One Case Submission (10%)
- Midterm (20%)
- Final Exam (40%)

B.3 CPA 676 Core Integration & Exam Preparation (3 credits, 12 sessions)

Session	Topic – Proposal A	Topic – Proposal B
1	Exam Writing Techniques* Review of Decision Competencies Framework, Ethical Mindset and Advanced Professional Competencies	Exam Writing Techniques* Review of Decision Competencies Framework, Ethical Mindset and Advanced Professional Competencies
2	Foreign currency transactions Leases (lessee perspective)	Content Review I [FR, Tax, Assurance, & Data Analytics]
3	Content Review I [FR, Tax, Assurance, & Data Analytics]	Content Review II [FR, Tax, Assurance, & Data Analytics]
4	Content Review II [FR, Tax, Assurance, & Data Analytics]	Content Review III [FR, Tax, Assurance, & Data Analytics]
5	Core Competencies Integration I (Exercises with a focus on integration of Assurance, Financial Reporting, and Taxation)	Core Competencies Integration I (Exercises with a focus on integration of Assurance, Financial Reporting, and Taxation)
6	Core Mock Exam I	Core Mock Exam I
7	Debrief Core Mock Exam I Core Competencies Integration II (Exercises with a focus on integration of Assurance, Financial Reporting, and Taxation with Data Analytics)	Debrief Core Mock Exam I Core Competencies Integration II (Exercises with a focus on integration of Assurance, Financial Reporting, and Taxation with Data Analytics)

8	Midterm (Integration Exam) [scheduled with CPA 679 5 hours to simulate Order Exam 1-A+B]	Midterm (Integration Exam) [scheduled with CPA 679 5 hours to simulate Order Exam 1-A+B]
9	Debrief Midterm (Core A+B Integration Exam) Core Competencies Integration III (Exercises with a focus on integration of Assurance, Data Analytics, Financial Reporting, Non-Financial Reporting, and Taxation)	Debrief Midterm (Core A+B Integration Exam) Core Competencies Integration III (Exercises with a focus on integration of Assurance, Data Analytics, Financial Reporting, Non-Financial Reporting, and Taxation)
10	Core Competencies Integration IV (Exercises with a focus on integration of Assurance, Data Analytics, Financial Reporting, Non-Financial Reporting, and Taxation)	Core Competencies Integration IV (Exercises with a focus on integration of Assurance, Data Analytics, Financial Reporting, Non-Financial Reporting, and Taxation)
11	Core Mock Exam II	Core Mock Exam II
12	Debrief Core Mock Exam II Review	Debrief Core Mock Exam II Review
	Final Exam (Core A+B Integration Exam) [scheduled with CPA 679 5 hours to simulate Order Exam 1-A+B]	Final Exam (Core A+B Integration Exam) [scheduled with CPA 679 5 hours to simulate Order Exam 1-A+B]

*The coverage of exam writing techniques includes, among others, approaching multiple choice questions, managing short cases (45-75 minutes), and how to integrate core competencies in responding to short cases.

Assessment CPA 676:

- Participation: Class case exercises (15%)
- Five Multiple Choice Quizzes (15%)
- Core Mock Exam I* (10%)
- Core Mock Exam II* (10%)
- Midterm (Core A+B Integration Exam)* (20%) [2 hours core common + 3 hours core licensure, if applicable]
- Final Exam (Core A+B Integration Exam)* (30%) [2 hours core common + 3 hours core licensure, if applicable]

*Candidates have access to the CPA Canada Handbooks, the Income Tax Act and the Excise Tax Act while responding to the core mock exams, including the midterm and final exam.

Course Champions

CPA 672: Mervat Saleh

CPA 675: Vanessa Campbell and Gail Fayerman

CPA 676: to be determined

Potential financial reporting teaching faculty

Adrian Argondizzo, Vanessa Campbell, Gail Fayerman, Sabrina Lairy, Gowthtiriga Nirmalathithakumar, Mervat Saleh, Nicholas Spicer

High-Level Course Summary

Course Title:

CPA 673 Taxation (3 cr)

Course Description

In this course, students develop core competencies in taxation. Using a case-based teaching approach, students apply appropriate tax treatment in compliance with tax laws and regulations for a broad range of routine tax events or transactions and tax planning at a low to moderate complexity. Upon successful completion of the course, students are capable to address routine taxation issues, using an ethical mindset and the advanced professional competencies.

Course Prerequisite:

CPA 670 (previously), CPA 671 and CPA 672 (concurrently, or previously)

Learning objectives:

- Apply routine *individual* income tax events or transactions at a low to moderate complexity, using an ethical mindset and advanced professional competencies
- Apply routine *corporate* income tax events or transactions at a low to moderate complexity, using an ethical mindset and advanced professional competencies
- Apply routine tax-planning opportunities and explain the impact of routine tax-planning opportunities
- Apply and explain appropriate tax treatment for routine GST concepts and measure the impact of routine GST concepts

Progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of Foundational Development:

- IX. Financial Reporting

High-level session plan

Session	Topic
1	Employment income, including employment taxable benefits & deductions
2	Business income - Schedule 1 adjustments and CCA (including recapture and terminal losses
3	Capital property - business income vs. capital gains, capital gains, identical property, capital gains reserves, replacement property, change in use, available for use, dispositions of land and building, and business investment losses
4	Other income & other deductions
5	Individual Taxable income and taxes payable
6	Midterm exam & debrief
7	Non-arm's length transactions
8	Tax planning: Residency, Divorced, deceased, shareholders compensations
9	Compensation planning between a shareholder and a closely-held corporation. Tax deferral and saving opportunities related to RESPs, RRIFs, and TFSAs.
10	Taxable income and part I taxes payable for corporation
11	Part IV taxes additional tax on personal services business income, RDTOH, refundable Part 1, Part IV, and dividend refund
12	GST concepts and Instalments and filing and payment deadlines
	Final Exam

Assessment

- Multiple choice quizzes (30%)
- Midterm exam (30%)
- Final Exam (40%)

Course Champions

Mervat Saleh

Potential teaching faculty

Mervat Saleh, Giuseppe Maselli, and Larry Jacobson

High-Level Course Summary

Course Title:

CPA 674 Compilations, Reviews & Audits (3 cr)

Course Description

In this course, students obtain core competencies in compilations, reviews, and audits of historical financial information. Using a variety of teaching methods that focus on a case-based teaching approach, students apply appropriate standards with an ethical mindset to these projects. Upon successful completion of this course, students are trained to perform compilations, reviews, and audits of historical financial information that serves the public interest.

Course Prerequisite:

ACCO 672

Learning objectives:

- Apply an ethical mindset in conducting compilations, reviews, and audits of historical financial information
- Demonstrate advanced professional competencies, including critical thinking, professional judgement, and professional scepticism, in conducting compilations, reviews, and audits of historical financial information
- Apply the CPA Canada Handbook Standards and Guidance in client acceptance and continuance, planning, execution, and reporting for compilations, reviews, and audits of historical financial information

Progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of Foundational Development:

- I. Assurance
- III. Ethical Decision-Making and Organizational Governance/Data Governance

High-level session plan

Session	Topic
1	Course Introduction and Professional Ethics
2	Fundamental Concepts
3	Ethical Decision-Making, Governance, and Regulatory Compliance
4	Structure of the CPA Standards / The Audit Risk Model
5	Pre-Engagement Considerations and Planning
6	Midterm / Risk Assessment Procedures (CAS 315)
7	Risk Assessment Procedures (continued) / Fraud (CAS 240) and Going Concern (CAS 570)
8	Internal Control Frameworks / IT effect on Audit
9	Responding to Risk Assessment (CAS 330)
10	Reporting and Documentation
11	Engagement, Completion & Finalization / Data Analytics
12	Compilations and Reviews contrasted with Audits
	Final Exam

Assessment

- Participation (10%)
- Term project (15%)
- Multiple choice quizzes (10%)
- In-class simulations (5%)
- Mid-Term Examination (10%)
- Final Exam (50%)

Course Champions

Patrick Delaney

Potential teaching faculty

Alexander Mazza, Patrick Delaney, Nadia Marra, Mohammed Al-Said

High-Level Course Summary

Course Title:

CPA 677 Applied Professional Accounting I (3 cr)

Course Description

In this course, students enhance their professional accounting competencies through acquiring three months of qualifying work experience in accountancy. During the course, students submit their professional accounting work plan. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.

Course Prerequisite:

CPA 670 (concurrently, or previously)

Learning objectives:

- Apply advanced professional competencies and ethical mindset in the chosen work setting
- Apply specific accountancy competencies that are relevant for the chosen work setting

Milestones:

- Submission of work plan to CPA Program
- Accumulating qualifying work experience in accountancy, following CPA Quebec Order criteria
- Learning reflection through interviews or written report at the end of 3-month work experience

Assessment

- Pass/Fail grade for submitted work plan
- Pass/Fail grade for learning reflection

Teaching Faculty

Not applicable. Course not for teaching credits. Work acknowledged by faculty as service activities, supported by CPA program staff.

Evaluation by a formed sub-committee of the CPA Program Committee, following the practice of co-op work-term evaluation committee in the department of accountancy

High-Level Course Summary for CPA 678 and CPA 679 – Licensure Module

A. Course Descriptions

A.1 CPA 678

Course Title:

Licensure Exam Preparation I (1.5 cr)

Course Description

In this course, students integrate and foster the previously acquired accountancy competencies to apply them to taxation projects in a multitude of scenarios and contexts at increased levels of proficiency. The course is designed specifically to cover additional taxation and integration topics relevant for licensure projects. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.

Course Prerequisites:

Prerequisites: CPA 676 (concurrently, or previously)

Notes: This course is required for students in the licensure track. There will be a surcharge for this course.

Learning objectives:

- Critically evaluate actions and decisions for tax treatment, using an ethical mindset and advanced professional competencies
- Apply routine tax-planning opportunities at a higher complexity level for complex business saes and potential tax-deferred transactions
- Apply routine GST concepts at a higher complexity including elections sales of assets and related corporations
- Explain the existence and purpose of GAAR and anti-avoidance provisions.
- Integrate previously acquired competencies in assurance, financial reporting, and taxation

A.2 CPA 679

Course Title:

Licensure Exam Preparation II (3 cr)

Course Description

In this course, students obtain core competencies in performing licensure projects that fall within and outside the scope of the CPA Canada Handbook - Assurance. Using a case-based teaching approach, students apply appropriate methodology and an ethical mindset to diverse assurance and trust engagements. The course is further designed to cover additional financial reporting and integration topics relevant for licensure projects. By the end of the course, students know how to bring logic, structure and trust to information to protect the public and act in the public interest. Using exam simulations, the course is part of the preparation for writing the CPA Professional Final Exam – Part 01 on the CPA Core – Licensure.

Course Prerequisites:

Prerequisites: CPA 678 (concurrently, or previously)

Notes: This course is required for students in the licensure track. There will be a surcharge for this course.

Learning objectives:

- Apply an ethical mindset in conducting diverse projects within the scope of the CPA Canada Handbook - Assurance and outside the scope of the CPA Canada Handbook - Assurance)
- Demonstrate advanced professional competencies, including critical thinking, professional judgement, and professional scepticism, in conducting projects within the scope of the CPA Canada Handbook - Assurance and outside the scope of the CPA Canada Handbook - Assurance)
- Manage client acceptance and continuance, planning, execution, and reporting tasks for projects within the scope of the CPA Canada Handbook - Assurance and outside the scope of the CPA Canada Handbook - Assurance)

- Critically evaluate actions and decisions for financial reporting treatment, using an ethical mindset and advanced professional competencies
- Apply appropriate accounting treatment for selected non-routine transactions at a low to moderate level of complexity
- Integrate acquired competencies in assurance, financial reporting, and taxation

The integration focuses, in particular, on the following competencies as per CPA CM 2.0 and Academic Guide:

- I. Assurance and Trust
- V. Financial Reporting
- IX. Tax

B. High-level session plans and assessments for CPA 678 and CPA 679

Note that CPA 678 and CPA 679 are scheduled concurrently. Session Number do not correspond to sequence of scheduling.

B.1 Taxation & Integration Component CPA 678 - High-level session plan

Session	Topic
#1	Sale of a business through an asset sale Case + debrief
#2	Sale of a business through a share sale (including QSBCS capital gains exemption) An acquisition of control Case + debrief
#3	Personal services business income Income splitting with family members Case + debrief
	Midterm (Core A+B Integration Exam [scheduled together with CPA 678, 679 and CPA 676] outside of session time (3 + 2 hours)]
#4	Potential uses and consequences of tax-deferred transactions that utilize sections 51, 85 and 86 Cases + debrief
#5	GST Sale of a business assets (S.167) GST Sale of real property GST Closely Related corporations Case + debrief

#6	Income splitting with family members GAAR and anti-avoidance provisions Case + debrief
	Join Final Core A+B Integration Exam [scheduled together with CPA 678 and CPA 676]

Assessment for CPA 678

- Multiple-Choice Quizzes (25%)
- Midterm* (35%) (Core A+B Integration Exam [scheduled together with CPA 678, 679 and CPA 676] outside of session time (3 + 2 hours)]
- Final Exam [Joint Final Core A+B Integration Exam]* (40%) [scheduled together with CPA 678 and CPA 676]

*Students that are not taking the licensure module only write Core A of the final exam.

B.2 Financial Reporting & Integration Component – Part of CPA 679 - High-level session plan

Session	Topic
#1	Integration Techniques Integration Practice
#2	Foreign currency translation Case + debrief
#3	Assets held for sale and discontinued operations Case + debrief
#4	Share-based payments Case + debrief
#5	Operating segments EPS (Diluted) Case + debrief
	Joint Final Core A+B Integration Exam [scheduled together with CPA 679 and CPA 676]

B.3 Licensure Component –Part of CPA 679 - High-level session plan

Session	Topic
#1	Course Introduction & Exam Writing Techniques Fundamental Concepts / Independence
#2	A Methodological Approach to a Professional Response in light of CPA's Advanced Professional Competencies
#3	Part A* – Projects Within the Scope of the CPA Canada Handbook - Assurance and Outside the Scope of the CPA Canada Handbook – Assurance
#4	Mock Licensure Exam I & Debrief
#5	Part B* – Projects Within the Scope of the CPA Canada Handbook - Assurance and Outside the Scope of the CPA Canada Handbook - Assurance Continued
#6	Midterm (Mock Licensure Exam II) & Debrief
#7	Part C* – Projects Within the Scope of the CPA Canada Handbook - Assurance and Outside the Scope of the CPA Canada Handbook - Assurance Continued
	Joint Final Core A+B Integration Exam [scheduled together with CPA 678 and CPA 676]

*See appendix for details on content coverage

APPENDIX TO CLASS SCHEDULE

PART A

Other Canadian Standards – General Assurance and Auditing

CSAE 3000: Attestation Engagements Other than Audits or Reviews of Historical Financial Information
CSAE 3001: Direct Engagements
CSAE 3530: Attestation Engagements to Report on Compliance
CSAE 3521: Direct Engagements to Report on Compliance
AuG-4: Services on matters Relating to Solvency

PART B

Other Canadian Standards - Specialized Areas Section

7060: Auditor Review of Interim F/S
Section 7600: Reports on the Applications of Accounting Principles Other Canadian Standards - Review Engagements
CSRE 4400: Agreed-upon Procedures Engagements
CSRE 4460: Reports on Supplementary Matters Arising from an Audit or a Review Engagement
Audit and reviews of a Financial Forecast or Projection
AuG-16: Compilation of a Financial Forecast or Projection

PART C

Due Diligence & Business Combinations
Forensic Auditing
CAS 402: Audit Considerations Relating to an Entity Using a Service Organization
CAS 720: The Auditor's Responsibilities Relating to Other Information
CAS 540: Auditing Estimates
CSAE 3416: Reporting on Controls at a Service Org. Relevant to User Entity's I/C over F/R
AuG 17 Derivative reporting
AuG 50 Government Audits Conducting a performance audit
Data analytics.

Assessment for CPA 679

- Term project (10%)
- Participation (20%) [including Mock Licensure Exams I]
- Multiple-Choice Quizzes (10%)
- Mid-Term Examination [Mock Licensure Exam II] (10%)
- Final Exam [Joint Final Core A+B Integration Exam]* (50%) [scheduled together with CPA 678 and CPA 676]

*Students that are not taking the licensure module only write Core A of the final exam.

Course Champions

Licensure Projects Component: Patrick Delaney

Financial Reporting Component: Mervat Saleh

Taxation Component: Mervat Saleh

Integration Component: Mervat Saleh

Potential teaching faculty (depending on component)

Mohammed Al-Said, Vanessa Campbell, Patrick Delaney, Gail Fayerman, Larry Jacobson, Nadia Marra, Giuseppe Maselli, Alexander Mazza, Mervat Saleh

High-Level Course Summary

Course Title:

CPA 680 Leadership Competencies (3 cr)

Course Description

In this course, students foster the acquired accountancy competencies in the topic areas of Ethical Decision-Making and Organizational Governance, Finance, Management Decision-Making, Strategy, Risk Management, and Innovation, as well as Value Creation. Using a case-based teaching approach, students refine their ethical mindset and advanced professional competencies to a higher proficiency level. Upon successful completion of the course, students are prepared to make, facilitate, communicate and implement performance-related decisions in a multitude of scenarios and contexts of higher ambiguity and complexity.

Course Prerequisite:

ACCO 676

There will be a surcharge for this course.

Learning objectives:

- Assess the ethical implications of actions and decisions
- Assess value creation goals and objectives relative to organizational strategy, governance, and sustainability.
- Assess resource allocation and performance-related decisions in different scenarios and contexts with higher ambiguity and complexity
- Assess an entity's financial state

Further progression of the following specific competencies as per CPA CM 2.0 and Academic Guide to the level of the Leadership Module:

- III. Ethical Decision-Making and Organizational Govern./Data Governance
- IV. Finance
- VI. Management Decision-Making and Information Systems/Technology
- VIII. Strategy, Risk Management and Innovation
- X. Value Creation

The following specific competencies as per CPA CM 2.0 and Academic Guide are embedded into the course without further proficiency progression:

- Assurance and Trust
- Big Data and Data Analytics
- V. Financial Reporting
- VII. Non-Financial Reporting
- IX. Tax

<u>High-level session plan</u>

Session	Topic
1	CPA Advanced Professional Competencies in Context of Higher Ambiguity and Complexity Ethics, Strategy & Value Creation
2	Ethics, Strategy & Value Creation continuation with an applied case
3	Financial Decision-Making and Risk Management
4	Financial Decision-Making and Risk Management continuation with an applied case
5	Strategy & Governance with an applied case
6	Managerial Decision-Making & Strategy
7	Managerial Decision-Making & Strategy continuation with an applied case
8	Integrated Case
	Final Exam

Assessment

- Midterm (case) (25%)
- Integrated Case (35%)
- Final Exam (case) (40%)

Course Champions

Sabrina Lairy and Giuseppe Maselli

Potential teaching faculty

Jon Graham, Derrick Gut, Sabrina Lairy, Giuseppe Maselli, Eva Lagou

High-Level Course Summary

Course Title:

CPA 681 Leadership Integration & Exam Preparation (3 cr)

Course Description

In this course, students integrate and apply the previously acquired accountancy competencies in a decision context of higher ambiguity and complexity. Using a case-based teaching approach and exam simulations, students put to test in an undirected manner their ethical mindset and advanced professional competencies across all topic areas in a multitude of scenarios and contexts. By the end of the course, students are well equipped to use their developed competencies to tackle real-world challenges encountered by professional accountants. The course is designed specifically for students intending to write the CPA Professional Final Exam – Part 02 on the CPA Leadership.

Course Prerequisite & Notes:

ACCO 680 (concurrently, or previously)

There will be a surcharge for this course.

Learning objectives:

- Apply advanced professional competencies and an ethical mindset in making, facilitating, communicating and implementing performance-related decisions in a multitude of scenarios and contexts at an increased level of proficiency, ambiguity and complexity.
- Apply the previously acquired accountancy competencies in an undirected manner.
- Integrate applicable competencies and relevant topic areas to case facts of higher ambiguity and complexity.
- Demonstrate judgement and critical thinking to determine which competencies are most appropriate for the specific context being addressed.

A review will be done of the following competencies as per CPA CM 2.0 and Academic Guide at the CPA Leadership Module level:

- III. Ethical Decision-Making and Organizational Govern./Data Governance
- IV. Finance
- VI. Management Decision-Making and Information Systems/Technology
- VIII. Strategy, Risk Management and Innovation
- X. Value Creation

The following competencies as per CPA CM 2.0 and Academic Guide will be reviewed when applicable in the analysis and decision-making of specific cases covered during this course:

- I. Assurance and Trust
- II. Big Data and Data Analytics
- V. Financial Reporting
- VII. Non-Financial Reporting
- IX. Tax

High-level session plan

Session	Topic
1	Review of the decision process – decision competencies framework as it applies to comprehensive integrated cases Review of the Ethical Mindset Review of integrated case writing best practices
2	Review of Strategy, Risk Management and Innovation Class case exercise 1
3	Review of Management Decision-Making Class case exercise 2
4	Case Simulation 0
5	Review of Management Decision-Making cont'd Debrief case simulation 0
6	Review of Ethics & Governance & Value Creation Class case exercise 3
7	Case Simulation 1
8	Review of Finance Debrief case simulation 1, 1on1 feedback
9	Review of Finance cont'd Class case exercise 3
10	Case Simulation 2
11	Review of Finance cont'd Debrief case simulation 2, 1on1feedback
12	Review of Information Systems/Technology Class case exercise 4
	Final Exam

Assessment

- Participation: Class case exercises and presentations (10%)
- Case Simulation 0 - Attempt – Comprehensive case write-up* (5%)
- Case Simulation 1 (Comprehensive case write-up)* (20%)
- Case Simulation 2 (Comprehensive case write-up)* (25%)
- Final Exam (Comprehensive case write-up)* (40%)

*****Candidates will have access to the CPA Canada Handbooks, the Income Tax Act and the Excise Tax Act while responding to the case simulations and final examination.

Course Champions

Eva Lagou

Potential teaching faculty

Derrick Gut, Eva Lagou

High-Level Course Summary

Course Title:

CPA 682 Applied Professional Accounting II (3 cr)

Course Description

In this course, students further enhance their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part II. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.

Course Prerequisite:

CPA 676 (concurrently, or previously)

Note: This course is only available for students that did not receive credits for CPA 678.

Learning objectives:

- Apply advanced professional competencies and ethical mindset in the chosen work setting
- Apply specific accountancy competencies that are relevant for the chosen work setting

Milestones:

- Submission of work plan – part II to CPA Program
- Accumulating qualifying work experience in accountancy, following CPA Quebec Order criteria
- Learning reflection through interviews or written report at the end of 9-months work experience

Assessment

- Pass/Fail grade for submitted work plan
- Pass/Fail grade for learning reflection

Teaching Faculty

Not applicable. Course not for teaching credits. Work acknowledged by faculty as service activities, supported by CPA program staff.

Evaluation by a formed sub-committee of the CPA Program Committee, following the practice of co-op work-term evaluation committee in the department of accountancy

High-Level Course Summary

Course Title:

CPA 683 Applied Professional Accounting II (1.5 cr)

Course Description

In this course, students augment their professional accounting competencies through acquiring three months of additional qualifying work experience in accountancy. During the course, students submit their professional accounting work plan – part III. At the end of the three-month period, students are either interviewed or submit a written report to reflect on their acquired ethical mindset and the advanced professional competencies as well as the specific applicable competencies in the different accountancy topic areas, such as Assurance, Financial Reporting, Management Decision-Making, or Taxation.

Course Prerequisite:

CPA 676 (previously)

Note: This course is only available for students that did not receive credits for CPA 678.

Learning objectives:

- Apply advanced professional competencies and ethical mindset in the chosen work setting
- Apply specific accountancy competencies that are relevant for the chosen work setting

Milestones:

- Submission of work plan – part III to CPA Program
- Accumulating qualifying work experience in accountancy, following CPA Quebec Order criteria
- Learning reflection through interviews or written report at the end of 9-months work experience

Assessment

- Pass/Fail grade for submitted work plan
- Pass/Fail grade for learning reflection

Teaching Faculty

Not applicable. Course not for teaching credits. Work acknowledged by faculty as service activities, supported by CPA program staff.

Evaluation by a formed sub-committee of the CPA Program Committee, following the practice of co-op work-term evaluation committee in the department of accountancy

Internal Memorandum

To: Members of Senate
From: Effrosyni (Faye) Diamantoudi, Provost and Vice-President, Academic
Date: May 8, 2026
Re: Academic Update

Announcements and Key Items

Renowned photographer and Concordia professor emeritus Gabor Szilasi passed away on April 10 at the age of 98. Szilasi taught at Concordia from 1980 to 1995 and was a major figure in Quebec's cultural landscape. Widely celebrated for the warmth and clarity of his photographic vision, his work documented the province's evolving social and cultural life from the Quiet Revolution to the present, leaving a lasting legacy in Canadian photography.

Liberal Arts College co-founder and Concordia professor emeritus Frederick Krantz passed away on May 3 at the age of 85. Krantz was a faculty member at Concordia University for over 40 years, first as member of the History Department specializing in the Italian Renaissance and World War II, and then as a member, co-founder and Principal of the Liberal Arts College.

Accolades

Journalism alumna Camille Cardin-Goyer (BA 16) was named *Châtelaine*'s new editor-in-chief. She wants Quebec women to see themselves in the 65-year-old magazine and aims to platform voices that don't always find their way into mainstream media.

History grad Natalie Nudell (BA 12) was recognized with the 2026 Vilcek Prize for Creative Promise. For the past decade, the fashion and textiles historian has uncovered the overlooked contributions of immigrant communities to the United States' fashion industry.

Gillian Sze (BA 06, MA 08), and assistant professor in the Department of English, was longlisted for the Al and Eurithe Purdy Poetry Prize for her book *An Orange, A Syllable*.

The 2026 Sobey Art Award longlist was recently released and includes a strong representation from the Faculty of Fine Arts (FoFA), with eight alumni among the 30 nominees. This recognition highlights the continued impact and a national presence of Concordia-trained artists, across Canada's contemporary art landscape. The Faculty and University Advancement will continue to follow the selection process as finalists, and the eventual recipients are announced.

FoFA recently recognized exceptional educators through its Distinguished Teaching Awards, highlighting excellence in pedagogy, curriculum development, and student mentorship. This year's recipients are Linda Swanson (Department of Studio Arts), recipient of the Established Award, and Cindy Coady (Department of Creative Arts Therapies) recipient of the Emerging Award. Their work reflects inclusive, engaged, and innovative teaching practices that significantly contribute to student learning and community-building within the faculty.
Erin Berry (BFA 2019) has been named the 2026 recipient of the Winifred Shantz Award for Ceramics, a national distinction recognizing emerging ceramic artists in Canada. The award, presented by the Canadian Clay & Glass Gallery, provides a $10,000 prize to support independent research and professional development, as well as the acquisition of a work for the Gallery's permanent collection.

Professor Chunjiang An, Associate Professor in the Department of Building, Civil, and Environmental Engineering, has been awarded a Dorothy Killam Fellowship. Valued at $80,000 per year over two years, the fellowship provides recipients with dedicated time to advance major research while pausing teaching and administrative duties.

Ameer Nizami, a PhD candidate in Chemical and Materials Engineering, received the $10,000 *Prix Mérite exceptionnel* from the *Fondation de l'Ordre des ingénieurs du Québec*. His research focuses on improving lithium-sulfur batteries using computational methods and artificial intelligence.

Jen Bourque, Chaplain and Coordinator, and Ridge Shukrun, former interim Interfaith Facilitator, contributed to the Centre for Teaching and Learning's recently published open educational resource, *Contemplative practices and pedagogy in the classroom.*

CEO Magazine ranked the John Molson School of Business (JMSB) EMBA 30th in the world and our MBA program maintained its Tier one position. The 2026 Global MBA Rankings profile 340 programmes across 24 countries.

JMSB undergraduate student delegates competed and podiumed in three international competitions:

- **University of Narvarra International Case Competition:** Hosted by the University of Navarra in Pamplona, Spain, from March 15-20, the JMSB undergraduates earned 2nd place.
- **Belgrade Business International Case Competition:** Hosted by the University of Belgrade, Faculty of Organizational Sciences in Belgrade, Serbia, from March 8-14, the JMSB undergraduate student delegates earned 2nd place.
- **U.PORTO International Case Competition 2025:** Hosted by the School of Economics and Management, University of Porto, in Porto, Portugal from November 20-28, 2025, the JMSB undergraduate student delegates earned 2nd place.

JMSB graduate student delegates competed in the International Business Ethics Case Competition (IBECC), held from April 9-11 in San Franciso, U.S.A., and earned 2nd place, 90 second pitch; 2nd place 10-minute presentation; and 2nd place, 25-minute presentation.

The Concordia Council on Student Life (CCSL) has awarded 57 projects a total of $58,020 for student led initiatives which contribute to student life. Special projects are funded twice a year for innovative and impactful activities.

Two Concordia undergraduate students, Mara Tartamella and Jon Marvin Reyes, were honoured with the Quebec Lieutenant Governer's Youth Medal for their contributions through volunteer involvement, determination and positive community influence.

New Initiatives

This past semester, the Department of Communication Studies offered a special topic, experiential learning course called "The Wheels of Steel: Sampling, Mixing and DJing as Media Production" (COMS 493), led by Owen Chapman. Undergraduate students got to explore the history, culture and techniques of DJing through hands-on practice. They welcomed guest artists such as Anna Friz, Claire Kenway, Tiana McLaughlan, Alanna Stuart, and Sophy Merizzi. The course emphasized performance-based assignments, collaboration and live campus events, offering students direct engagement with Montreal's DJ community.

The *Département d'études françaises* launched the new research-creation stream of its MA in Traductologie. The new option invites graduate students to explore translation as a space for experimentation, through a research-creation approach where transformation, rewriting, and dialogue between languages give rise to new forms and previously unheard voices.

A growing collaboration between FoFA and the Society for Arts and Technology (SAT) is advancing research-creation at the intersection of generative artificial intelligence (AI), immersive technologies, and media arts. Led in part by alumnus and postdoctoral researcher Jean-Michaël Celerier, the initiative focuses on developing open-source, artist-centered tools that prioritize data sovereignty, authorship, and local control. This work also aligns with ongoing research at Concordia, including collaborations with the Critical Practices and Materiality Research Chair, and supports new approaches to lightweight, accessible creative technologies for artists.

The SHIFT Centre for Social Transformation (SHIFT) worked closely with community partners JIA Foundation and Tkà:nios - it Grows to produce a video showcasing its Research and Advocacy program The video highlights the program's innovative approach to engaging graduate students in community-driven research as a way to, as one of the graduate fellow's puts it, "understand the world and learn how to make it better for the people who live in it."

The Concordia Continuing Education (CCE) digital programs continue to perform well, and the CCE are actively keeping them current in rapidly evolving fields. To be launched in the Fall 2026, the *AI Proficiency Program* has been updated to incorporate emerging developments such as Generative AI and AI agents. Similarly, the *Big Data Business Analytics* program has been refreshed under a new title, *AI-Powered Business Intelligence and Data Analytics*, with expanded AI integration throughout and the addition of a new course, *Building Cloud Data Workflows for Analytics*. Together, these updates reflect the CCE's commitment to delivering programming aligned with evolving industry needs.

FutureBound (Student Success Centre) expanded experiential learning and skill development this term through several new initiatives. The Entrepreneurship Mixer brought together more than 80 participants for mentorship with industry professionals and connection within Concordia's entrepreneurial ecosystem. Revamped SkillXchange cohorts concluded with public showcases, highlighting growth in student confidence, communication, and applied skills. FutureBound also expanded its Digital Capabilities &

Mindsets module through a new collaboration with IEEE, offering introductory workshops in machine learning and Git.

Events – upcoming

The 14 new artists joining the 2026-27 Art Volt Collection cohort will be officially announced in May, with their works presented at the launch exhibition at the FOFA Gallery. The vernissage will take place on June 2, and the exhibition will be on view until June 30, 2026.

On May 12, SHIFT and the Office of Community Engagement (OCE) will host a year-end showcase for their Community-Based Internship Program, bringing together students, host organizations, and community members to reflect on the outcomes of the program. Drawing from placements in 24 community organizations, the multimedia showcase will offer a collective view into how students across departments are working, learning, and responding to community needs in different contexts.

At the beginning of May, FoFA students will take part in a five-week immersive program in *Baie-Saint-Paul* (Charlevoix) to deepen their French while advancing their artistic practice in a fully francophone, culturally rich environment. The experience includes engagement with local artists, shared living, regional exploration, and critical reflection on landscape. Originally developed and coordinated by *Réussir en français*, the initiative is now jointly led by FoFA and the Faculty of Arts and Science (*Département d'études françaises*), in collaboration with local cultural partners such as the *Musée d'art contemporain de Baie-Saint-Paul* and is supported by Entente Canada-Québec funding.

Events – past

On May 5, SHIFT invited award-winning journalist Rachel Gilmore, social impact leader Danièle-Jocelyne Otou-Nguini, and managing editor of *The Rover* Savannah Stewart for a free workshop called "Pathways to Narrative-Building: Journalism, storytelling, and mobilizing media." This skill-share event centered on practical approaches to sharing knowledge and understanding impact in an ever-shifting media landscape, with the goal of preparing participants to more effectively challenge dominant narratives through their storytelling.

FoFA, with the support of University Advancement, hosted a special School of Performance launch event on May 4 at *Salon Urbain, Place des Arts*. The event showcased short performances by students from Contemporary Dance, Music, and Theatre, highlighting emerging and interdisciplinary talent across these disciplines. The evening also featured a special performance by guest artist and alumna Dawn Tyler Watson, internationally acclaimed singer-songwriter and JUNO Award-winning blues artist.

This semester, the Vanier Library tested out offering Technology Sandbox programming at a different time (towards the end of the semester) to determine best timings for workshops (Arduino 101, Design for 3D printing) and activities (3D printing live demo, and button making). Notebook Making Basics and Zine Making Basics workshops have been offered in the past at Webster Library and were offered for the first time at Vanier Library taught by Aeron MacHattie, Teaching & Research Librarian, and Melissa Rivosecchi Head, Vanier Library. Both workshops were well attended, and participants appreciated the workshops being offered at Loyola campus. Going forward, funding from the Library Services Fund will support a

wider variety of borrowable equipment offerings at Vanier Library (e.g., gaming laptops, media creation technology, etc.) that will better serve the Loyola campus.

At the end of April, the Concordia University Press (CUP) published *Literary Life After Death: Commemorations of Writers in English-Speaking Canada*, by Carole Gerson, FRSC, and professor emerita of English Literature at Simon Fraser University. Carole Gerson categorizes and analyzes the ways in which writers have been commemorated in Canada to show how tributes have changed over time and in response to evolving national and social concerns. First focusing on officially sanctioned commemorations by governments in objects such as coins, stamps, and plaques, as well as historic sites and place names, the book then turns to commemorations driven by local communities and non-profit organizations in various house museums, literary tourist sites, statues, parks, and other markers. This is the first book in the series Authors, Publishers, Readers, Texts: Studies in Book History and Print Culture, edited by Ruth Panofsky (FRSC, Toronto Metropolitan University), and sponsored by the Bibliographical Society of Canada.

The Multi-faith and Spirituality Centre's final Community Meal of the year was the *Cabane-à-Sucre* breakfast on April 15, in collaboration with Espace Franco.

On April 15, the Cinema program, in collaboration with expert guest-in-residence Christian Beltrami, hosted a talk at 4TH SPACE on AI and screenwriting in practice. The discussion, situated within a broader reflection on AI and storytelling, examined issues of representation, collective memory, and cultural transmission in contemporary screenwriting. This activity was part of *CTRL + AI – Human Creativity and Agency in the Age of AI*, an initiative supported by the Tom Berry Fund for AI and Creativity that brings artists and cultural practitioners into the classroom and to public audiences through a for-credit course, public conversations, and hands-on workshops focused on artistic agency and critical engagement with AI.

On April 15, the Concordia Engagement Awards were held at the Loyola Chapel to celebrate 35 Concordians for their exceptional contributions to student life, volunteerism, safety and sustainability at the university. Students, staff and faculty were celebrated by their peers and colleagues at the annual event which is hosted by the Office of Student Life and Engagement with collaboration from the Office of Sustainability, Environmental Health and Safety and the Multi-faith and Spirituality Centre.

At the 2026 Plural Contemporary Art Fair in Montreal, which ran from April 10-12, where the Concordia Art Volt Collection was present, works by alumni Gabor Bata (MFA 23) and Lucy Gill (BFA 25) were acquired or sold to private and institutional collectors, including Desjardins, further consolidating the national reach of the program.

Réussir en français has partnered with the *Fondation Paul Gérin-Lajoie* (PGL) since 2024 to develop educational content as part of the *Dictée des municipalités*, an initiative designed for newly arrived immigrants who wish to learn French. This initiative has provided a valuable opportunity to collaborate with a foundation and organizations committed to promoting the French language, while also introducing newcomers to Concordia. The 2nd edition of the PGL Dictation for municipalities occurred in Longueuil. It began in February and concluded on April 11, at Longueuil City Hall with a community dictation event as its closing activity.

On April 10-11, Concordia's School of Irish Studies hosted the Willie Clancy School of Traditional Music, featuring a free Masters Concert of Irish and Québécois music alongside lectures and workshops. The

event brought together renowned artists including Séamus Ó Rócháin, Bríd O'Donohue, Siobhán Peoples, Martine Billette, Seán Ferguson, Steve Jones, Kate Bevan-Baker, and Gearóid Ó hAllmhuráin, fostering cross-cultural exchange between Irish and Québécois musical traditions.

On April 2, the School of Community and Public Affairs hosted a public conversation marking the 150th anniversary of the Indian Act, featuring the Honourable Mandy Gull-Masty, Minister of Indigenous Services; Ghislain Picard, former Chief of the Assembly of First Nations Quebec-Labrador; and Joe Deom, Elder from the Kahnawà:ke Longhouse, moderated by Emanuel Lowi. The discussion emphasized critical reflection on the Act's ongoing impacts and future, offering students direct engagement with both federal and Indigenous perspectives. Gull-Masty also shared insights from her role in government, underscoring her connection to Concordia as an alumna.

At the 2026 edition of *Délie ta langue*, a nationwide French public-speaking competition held on March 30 at the Grande Bibliothèque (BAnQ) in Montréal, Concordia undergraduate software engineering student Wendy Mbog won first place and a $5,000 prize awarded by Québec's *Ministère de la langue française.* Supported by *Espace Franco*, *Réussir en français*, and mentors from the *Département d'études françaises,* Mbog delivered a compelling winning speech centered on an expression highlighting the importance of women using and owning their voices, emphasizing resilience, self-assurance, and the power of speaking up.

Final year students from the Gina Cody School presented their Capstone Projects from March 30 to April 2. The projects spanned multiple disciplines, including electrical, mechanical and software engineering, as well as aerospace, industrial, civil, and building engineering. The Capstone Poster Presentation highlighted how final-year engineering students applied their knowledge to real-world challenges. Faculty, industry professionals and the Concordia community were invited to meet the numerous teams, explore their work, and celebrate months of design, testing and refinement.

In March, the Black Perspectives Office (BPO) facilitated *Navigating Bias While Building Your Career,* a workshop delivered for the NouLa Centre for Black Students as part of their *Black to Work: A Young Black Professional's Guide to the Workplace* series. That same month, in collaboration with the School of Graduate Studies (SGS), the BPO offered *Navigating the Institution as a Doctoral Student*, a workshop designed for prospective and current PhD students from underrepresented backgrounds. In April, the BPO, again in partnership with SGS, continued this work by delivering *Understanding the Politics of Being a Doctoral Student* to the same audience of prospective and current PhD students from underrepresented backgrounds.

On April 21, the OCE hosted From labour to rage to rest: How can rest be mobilized as a liberatory practice? in partnership with the Leonard and Bina Ellen Art Gallery. Featuring two artists as guest speakers, this public conversation invited participants to explore how cultural traditions and ancestral practices inform our understanding of rest today and to honor rest as a radical act of care and resistance.

On April 13, representatives from the John Molson Executive Centre attended the *Grande Soirée Immobilière de Montréal*, organized by the *Institut de développement urbain du Québec* (IDU), to promote the Centre's newly appraised Commercial Real Estate Certificate in partnership with the Institute. The prestigious networking event brought together over 1,100 key industry players, including major institutional owners, developers, and real estate professionals.

The Otsenhákta Student Centre (Office of Student Life and Engagement) unveiled a new mural by Inuk artist and MFA student Jason Sikoak just outside the centre's doors. The mural was revealed during the OSC's end-of-year feast on April 9. Donated by *le Mouvement pour mettre fin à l'itinérance à Montréal*, the mural was mounted with support from MU Montreal.

From February 27 to March 1, the Troitsky Bridge Building Competition took place, showcasing student work in structural design. The Troitsky Bridge Building Competition is a competitive event held at Concordia. Open to all bachelor's in engineering students, the competition consists of designing and building a model bridge out of ONLY popsicle sticks, toothpicks, white glue and dental floss. Participating teams of engineering students come from universities across Canada and the United States.

On March 20, the Library partnered with the Office of Research to co-deliver Narrative CV workshops. The workshop series introduced and offered guidance to faculty members to craft a compelling narrative, as Narrative CVs are required for many of the 2026 research grant competitions, such as. NFRF, FRQ, and some tri-agency.

On March 12, the OCE hosted its second University of the Streets Café conversation of the winter semester, "Tossing seeds into the ground: How do Indigenous and Black communities mobilize towards a common goal?". Featuring Concordia INDI MA student, Nadia Bunyan, and Idle No More co-founder, Widia Larivière, the conversation explored strategies, challenges, and successes behind building movements that create lasting change.

From March 7-8, the SSHRC-funded community-university research collaboration, Community Centred Knowledges: fostering Black wellness in Montreal, hosted their capstone conference at the SHIFT. Actively supported by the OCE since 2024, and led by Dr Lisa Ndejuru and professor Marie-Jolie (MJ) Rwigema of Concordia's Applied Human Sciences Department in collaboration with the Black Healing Centre, the conference highlighted 3 years of research findings that include a community-sourced definition of Black wellness and an exploration of the links between Afro-positivity, ancestral practices, and Black wellness models in Montreal.

From February 27 to March 1, the Troitsky Bridge Building Competition took place, showcasing student work in structural design. The Troitsky Bridge Building Competition is a competitive event held at Concordia. Open to all bachelor's in engineering students, the competition consists of designing and building a model bridge out of ONLY popsicle sticks, toothpicks, white glue and dental floss. Participating teams of engineering students come from universities across Canada and the United States.

In March, the Public Art Lead, in partnership with the Indigenous Directions Leadership Council, launched two new Indigenous public art commissions for Concordia's Hall Building terrace. Four artists were invited to propose a concept. Three artists were retained by the Council: Concordia master's student Jason Sikoak for the bronze medallion; and Hannah Claus, Associate Professor of Studio Arts and CoDirector of the Indigenous Futures Research Centre, and multidisciplinary artist Kaia'tano:ron Dumoulin Bush for the mural. The new commissions will be unveiled at a launch event on September 30th, 2026.

The Spring Season at 4TH SPACE was briskly paced to include over forty events across all Faculties.

- 4TH SPACE has been collaborating with the Willem de Kooning Academy in Rotterdam (WdKA) for the last few years to support a series of exchanges linking their art school with Concordia's.

- On March 17, 4TH SPACE welcomed artists and educators Michael Murtaugh and Lídia Pereira Malho Rodrigues here for a conversation with Concordia's own Pippin Barr, Professor in Design and Computation Arts.

- On March 12, 4TH SPACE's Closer Look series brought their cameras behind the scenes at the Leonard & Bina Ellen Gallery's Collection Vault. Julia Eilers Smith, Max Stern Curator of Research and Collection, and Nicole Burisch, Director, demonstrated how the Vault works as a storage site for the gallery's collection and as a controlled environment for art historical research.

- To help celebrate International Women's Day, on March 3, the BPO worked with Black Girl Magic Canada and Barbados House to bring researcher Dr. Myrna Lashley, entrepreneur Maudeleine Myrthil, and Joanna Kanga, Lead Press Secretary to the Mayor of Montréal to reflect on how Black women continue to shape our communities, and how the next generation can build its future.

- On February 25, 4TH SPACE worked with James Moore, Concordia's new university librarian for open scholarship, on an event that was part of Freedom to Read Week. The event titled Unsilencing the Literary Landscape looked at censorship and the suppression of ideas in libraries across the U.S.A. and Canada. James' conversation with keynote speaker Dartmouth historian Matthew F. Delmont on the removal of books detailing Black history from American military libraries connected with his own family's experiences.

- A yearly event is Digital Skill Share, our one event in the calendar that is staff focused. From February 24-25, a series of panels brought staff from different departments to share their experiences and strategies for well-being, productivity and growth – and of course, how to deal or avoid AI in our daily work.

- Talking Shop is a new live podcast series developed by Richard Sejean, lecturer in the Department of Marketing. For the fourth episode, Michèle Paulin, professor in the Department of Marketing, sat down with Solène Thubert and Jules Trolet, co-founders of the shoe-refurbishing company TROLET to discuss how they have been learning and collecting the knowledge of shoe repair in Montreal as part of their growing business.

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Microprogram in Production Accounting for Film and Television (JMSB-ACCO-6020)(the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The 6-credit Microprogram, offered in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning/Analysis).

The Microprogram is developed based on industry feedback, program benchmarking, the analysis of job postings, and information gathered through hosted focus group meetings with the *Association québécoise de la production médiatique*.

The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the undergraduate Microprogram in Production Accounting for Film and Television (JMSB-ACCO-6020), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

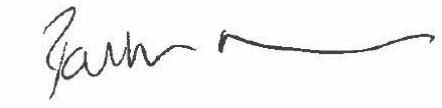
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Undergraduate Program (Fast Track) - JMSB-ACCO-6020 - VERSION : 1

Summary and Rationale for Changes

The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Learners acquire the key competencies necessary for this role in ACCO 250, ranging from reporting production costs and handling accounts payable to processing reimbursements and payroll. In ACCO 260, learners can foster their knowledge and skills in production accounting by acquiring key competencies to perform financial planning and analysis tasks with a focus on preparing, analyzing, and controlling production budgets. The microprogram positions learners to launch or transition into a successful career in the dynamic and demanding field of production accounting in film and television.

The microprogram is developed based on industry feedback, program benchmarking, the analysis of job postings, and information gathered through hosted focus group meetings with the Association québécoise de la production médiatique.

Resource Implications

Two new courses (one section per course) per academic year subject to meeting the applicable minimum enrollment threshold at JMSB for undergraduate elective courses. The dean of JMSB approved the resulting resource implications for the faculty.

New Undergraduate Program (Fast Track) - JMSB-ACCO-6020 - VERSION : 1

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Sandra Betton, Associate Dean, Professional Graduate Programs,
Faculty Academic Programs Committee, 20 Mar 2026

Please find attached the proposal for the Microprogram in Production Accounting for Film and Television. The JMSB Faculty Academic Programs Committee (FAPC) approved these changes on March 20, 2026. Since Faculty Council has delegated approval privileges to FAPC (with the exception of major changes) this dossier will only shared to Faculty Council but not submitted for approval at their meeting scheduled on April 23, 2026. I kindly request that the proposed changes be presented for consideration at the Graduate Curriculum Committee meeting on April 14, 2026.

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Anne-Marie Croteau, Dean, John Molson School of Business,
Faculty Council, 23 Apr 2026

Approved by:

Sandra Betton, Associate Dean, Professional Graduate Programs,
Faculty Academic Programs Committee, 20 Mar 2026

Since the JMSB Faculty Council has delegated approval authority to FAPC, this dossier will be presented to the JMSB Dean at the next Faculty Council meeting on April 23, 2026, for information purposes only and not for approval.

Summary of Changes (New Undergraduate Program (Fast Track))

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
ACCO 250 Film and TV Production Accounting New	★	★	★	★		★	★	★	★	
ACCO 260 Financial Planning & Analysis in Film and TV New	★	★	★	★		★	★	★	★	

Regulation Changes:

- Admission Requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Production Accounting for Film and Television

Calendar Section Name: Admission Requirements
Calendar Section Type: Regulation
Description of Change: Admission Requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Accountancy

Calendar publication date: 2027/2028/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 61 John Molson School of Business > John Molson School of Business > Section 61.140 Program Options for Non-Business Students > Production Accounting for Film and Television > Microprogram in Production Accounting for Film and Television

Present Text calendar	Proposed Text
	Admission Requirements - This microprogram welcomes candidates from diverse professional and educational backgrounds who are interested in getting a jump start on a career as production accountant in film and television. - Only Canadian citizens and permanent residents are eligible to apply. - No previous degree or diploma required for acceptance. - Students already registered in an undergraduate program at Concordia are ineligible for the Microprogram but may be eligible to enroll into the courses as part of their elective courses, if applicable.

Rationale:

Resource Implications:

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Production Accounting for Film and Television

Calendar Section Name: Production Accounting for Film and Television
Calendar Section Type: Program
Description of Change: Production Accounting for Film and Television New

Proposed: Undergraduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Accountancy
Program Name: Production Accounting for Film and Television
Program Type: Micro Program
Degree: Micro Program

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 61 John Molson School of Business > John Molson School of Business > Section 61.140 Program Options for Non-Business Students > Production Accounting for Film and Television > Microprogram in Production Accounting for Film and Television > Program Requirements

Type of Change: New Program

Present Text calendar	**Proposed Text**
credits	**6 credits** Production Accounting for Film and Television
0	~~0~~ ACCO 250 Film and TV Production Accounting (3) ACCO 260 Financial Planning & Analysis in Film and TV (3)

Rationale:
Industry partners, located, among others, in Quebec, Ontario, and California, of the Faculty of Fine Arts and the Mel Hoppenheim School of Cinema as well as the Association québécoise de la production médiatique have consistently expressed that there is a shortage of qualified Production Accountants in film and television. The microprogram addresses this qualification shortage by providing learners with the necessary applied accounting knowledge to work as Production Accountant in film and television.

Resource Implications:
Two new courses (one section per course) per academic year subject to meeting the applicable minimum enrollment threshold at JMSB for undergraduate elective courses.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Production Accounting for Film and Television

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Accountancy

Calendar publication date: 2027/2028/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 61 John Molson School of Business > John Molson School of Business > Section 61.140 Program Options for Non-Business Students > Production Accounting for Film and Television > Microprogram in Production Accounting for Film and Television

Present Text calendar	Proposed Text
	Notes Students who completed these courses as part of another degree program cannot count these credits towards the microprogram.

Rationale:

Resource Implications:

D3

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Production Accounting for Film and Television

Calendar Section Name: ACCO 250
Calendar Section Type: Course
Description of Change: ACCO 250 Film and TV Production Accounting New

Proposed: Undergraduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Accountancy

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 61 John Molson School of Business > John Molson School of Business > Section 61.40 Department of Accountancy > Department of Accountancy Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ACCO 250 Film and TV Production Accounting (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
	This course offers an applied introduction to the responsibilities of a film and television production accountant. Using practical examples, basic accounting principles, and software applications, learners develop competencies in key areas, including production cost reporting, accounts payable and reimbursement management, payroll processing, and compilation of tax credit information. Successful completion of this course provides the foundational skills necessary for a career in production accounting across the film, television, and creative sectors.
Component(s):	*Component(s):*
Notes :	*Notes :*
Anti-requisite Programs :	**Anti-requisite Programs :** The course is not open to BComm/BAdmin students.
Other note :	**Other note :** This course cannot be used towards the program requirements for a business degree.

Rationale:
This course is added for the planned 6-credit Microprogram for Production Accounting in Film and Television in collaboration with the Faculty of Fine Arts to meet industry demand for Production Accountants in film and television.

Resource Implications:
One section per academic year subject to meeting the applicable minimum enrollment threshold at JMSB for undergraduate elective courses.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Production Accounting for Film and Television

Calendar Section Name: ACCO 260
Calendar Section Type: Course
Description of Change: ACCO 260 Financial Planning & Analysis in Film and TV New

Proposed: Undergraduate Curriculum Changes

Faculty/School: John Molson School of Business

Department: Accountancy

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 61 John Molson School of Business > John Molson School of Business > Section 61.40 Department of Accountancy > Department of Accountancy Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	ACCO 260 Financial Planning & Analysis in Film and TV (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* This course provides an applied understanding of financial planning and analysis of production projects. Using practical examples, basic management accounting principles and software applications, learners acquire skills in preparing, analyzing, and controlling production budgets. They further learn about sources of production financing and subsidies as well as post-production tasks, including inventory tracking and assisting the audit process. Successful completion of this course provides the necessary foundational competencies to perform financial planning and analysis tasks for production projects in the film, television, and other creative industries.
Component(s):	*Component(s):*
Notes :	*Notes :*
Anti-requisite Programs :	**Anti-requisite Programs :** The course is not open to BComm/BAdmin students.
Other note :	**Other note :** This course cannot be used towards the program requirements for a business degree.

Rationale:
This course is added for the planned 6-credit Microprogram for Pr collaboration with the Faculty of Fine Arts to meet collaboration with the Faculty of Fine Arts to meet industry demand for Production Accountants in film and television.

Resource Implications:
One section per academic year subject to meeting the applicable minimum enrollment threshold at JMSB for undergraduate elective courses.

Impact Report

Courses

ACCO 250 Film and TV Production Accounting New

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 61 John Molson School of Business -> John Molson School of Business -> Section 61.40 Department of Accountancy -> Department of Accountancy Courses

Source of Impact

ACCO 260 Financial Planning & Analysis in Film and TV New

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 61 John Molson School of Business -> John Molson School of Business -> Section 61.40 Department of Accountancy -> Department of Accountancy Courses

Source of Impact

Other Units

Addition of **ACCO 250** to **Production Accounting for Film and Television** requirement

Source of other unit Impact

- Course is housed in Section 61.40 Department of Accountancy

Addition of **ACCO 260** to **Production Accounting for Film and Television** requirement

Source of other unit Impact

- Course is housed in Section 61.40 Department of Accountancy

DATE: February 12, 2026

TO: Dr. Anne-Marie Croteau, School of Graduate Studies

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Production Accounting for Film and Television

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the Microprogram in Producting Accounting for Film and Television which will be housed at the John Molson School of Business and will draw learners from the Film and Television industry in Quebec and beyond. It is understood between all parties involved that JMSB will house the courses and reap the FTEs, and FOFA will support with recruitment efforts both within and external to the University. Letters from both Deans will be included in the final version of the dossier testifying to this division of resources and effort.

We commend the collaboration between FOFA and JMSB in proposing a program that is truly visionary in its scope and creates the possibility of recruiting a new variety of learner to the University. We are happy to support this endeavour, and congratulate you on the development of this innovative and important program.

Most sincerely,

RACHEL BERGER

Dr. Rachel Berger

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Annie Gerin, Dean, Faculty of Fine Arts
Dr. Sandra Betton, Assocaite Dean, John Molson School of Business
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

NEW UNDERGRADUATE MICROPROGRAM PROPOSAL

GENERAL INFORMATION

Program name	Microprogram in Production Accounting for Film and Television
Hosting unit(s)	JMSB, Associate Dean, Undergraduate Programs in collaboration with the Faculty of Fine Arts
Total credit value	6 credits
Microprogram leads	Department of Accountancy in collaboration with the Faculty of Fine Arts
Proposed start date	May 2027
Dean signature	

MICROPROGRAM OVERVIEW (250 words)

Brief description

The 6-credit microprogram in Production Accounting for Film and Television provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. During the first three-week course, learners acquire the key competencies necessary for the role, ranging from reporting production costs and handling accounts payable, to processing reimbursements and payroll. During the second three-week course, learners acquire key competencies to perform financial planning and analysis tasks with a focus on preparing, analyzing, and controlling production budgets. The microprogram positions learners to launch or transition into a successful career in the dynamic and demanding field of production accounting in film and television.

Distinguishing features

The microprogram is developed based on industry feedback, program benchmarking, the analysis of job postings, and information gathered through hosted focus group meetings with the Association québécoise de la production médiatique. The association has signaled that it will support the recruitment of guest speakers and co-instructors as well as help promote the microprogram.

The two courses in the proposed microprogram will be applied, using a production case and a common production accounting software to experience the role as production accountant hands-on. This adds an experiential component to the courses.

The microprogram is designed to potentially expand into a 15-credit Certificate in Production Accounting. This certificate would add a 9-credit Production Accounting stage to the proposed 6-credit microprogram (two 3-credit courses). A further expansion possibility is to see the two proposed courses as part of a possible program for Production Managers in the Entertainment Industries.

The course delivery will be flexible to accommodate different learners through two 3-week courses. Each course will include some double sessions and evening sessions, combining a mix of in-person, synchronous online, and hyperflex (if technically possible) teaching formats. Depending on learners' demand, each course could also be offered in the form of a two-week intense option.

DESIRED STUDENT PROFILE (150 words)

The target audience and desired student profile:

- Upskilling opportunity for those in industry or those with a Technique Comptable from CEGEP who may need the extra training to enter the industry.

- Graduates/alumni of Fine Arts programs who want an 'add on' to their degree.

- New students wanting to acquire specific accounting and financial skills in the area of production accounting.

MICROPROGRAM AT THE GRADUATE LEVEL (100 words)

Not applicable. Microprogram is at the undergraduate level.

ADMISSION REQUIREMENTS (100 words)

Admission Requirements

- This microprogram welcomes candidates from diverse professional and educational backgrounds who are interested in getting a jump start on a career as production accountant in film and television.
- Only Canadian citizens and permanent residents are eligible to apply.
- No previous degree or diploma required for acceptance.
- Students already registered in an undergraduate program at Concordia are ineligible for the Microprogram but may be eligible to enrol into the courses as part of their elective courses, if applicable.

The wording of the admission requirements is inspired by the Microprogram in Fundamentals of Digital Filmmaking, except for the last bullet point, which is a modified version from the Sustainability Principles Microprogram.

Source: https://www.concordia.ca/finearts/cinema/programs/digital-filmmaking.html#admission

CURRICULUM (400 words)

Learning outcomes

By the end of the microprogram, learners:

- Explain the roles and responsibilities of production accountants and of financial analysts in production accounting
- Apply appropriate accounting treatment for preparing production budgets, for processing accounts payables, payroll, and other expenses, and for compiling tax credits that are common for film and television
- Analyze production budgets to determine potential variances from budgeted costs

Targeted skills

By the end of the microprogram, learners acquire the following skills:

- Prepare production costs reports, using the standard accounting ledger and accounting software for film and television
- Work with the different collective agreements that are applicable for handling payroll, advances, reimbursements, and other expenses that are common for film and television
- Compile information for tax credits
- Prepare and analyze production budgets that are typical for film and television

- Handle inventory tracking and other post-production tasks

Courses

The microprogram encompasses two new courses:

- ACCO 250 Film and TV Production Accounting (3 cr)
- ACCO 260 Financial Production Planning & Analysis in Film and TV (3 cr)

Please refer to the CCMS report, which entail course code, course name, and course description as well as the high-level course summaries attached.

Structure and duration

The 6-credit microprogram consists of two 3-credit courses. ACCO 250 is the core course, after which learners can take ACCO 260 to foster their knowledge and skills in production accounting in the context of film and television. ACCO 260 will be marketed as an optional top-up in case learners want to further upskill and earn the microprogram certification.

Each course is offered in a three-week format to cater to working and non-working learners. The 12 sessions of 2 hours 45 minutes are planned to be scheduled over three weeks, including some double sessions and evening sessions, combining a mix of in-person, synchronous online, and hyperflex (if technically possible) teaching formats. Alternatively, each course can be scheduled as intensive course over 2 weeks.

RATIONALE AND NEED (300 words)

Societal need

Industry partners, locatedin Quebec, Ontario, and California, of the Faculty of Fine Arts and the Mel Hoppenheim School of Cinema as well as the Association québécoise de la production médiatique among others, have consistently expressed that there is a shortage of qualified Production Accountants in film and television. The microprogram addresses this qualification shortage by providing learners with the necessary applied accounting knowledge to work as Production Accountant in film and television.

Comparable programs have been identified at the Schulich Exec Education-York University and Centennial College, Toronto. The Schulich Exec Education program called “Production Accounting for Film and Television” offers an entry-level certification in production accounting for film and TV production over six weeks, encompassing 11 three-hour modules.

Source: https://execed.schulich.yorku.ca/program/production-accounting-for-film-and-television/#program-overview

Centennial College offers a micro-credential called “Film and Television Production Accounting Basic Skills” in the form of an evening course from 6-9 p.m. with a mix of synchronous and asynchronous online delivery.

Source: https://secure.centennialcollege.ca/webreg/coursedetail.do?CourseCode=FTPA-100

Why Concordia

The proposed microprogram builds on the strong reputation of the Mel Hoppenheim School of Cinema and the Department of Accountancy. Both are recognized leaders in their fields. The Mel Hoppenheim School of Cinema is the largest university-based centre for the study of film animation, film production and film and moving image studies in Canada. The Department of Accountancy is one the largest in the country, offering the second largest university CPA-program in Quebec. This blend of expertise and reputation in Film and Television as well as Accountancy puts Concordia in a strong position to offer this microprogram.

The microprogram is housed at JMSB given the microprogram's subject matter of accountancy but offered in collaboration with FOFA given the faculty's strong partnerships with the film and television industries and the target career of learners, enrolled in the microprogram.

We do not anticipate negative impacts on other undergraduate programs at JMSB, respectively in the Department of Accountancy given that the microprogram is a 200-level program, targeting primarily non-business university students who want to upskill and acquire specific accounting/financial skills in the area of production accounting. The program is further highly specialized, offering additional industry-specific training, for anyone interested in working in this field.

The microprogram is an attempt to foster program collaboration among faculties, cater to non-traditional university audiences, and meet a market demand for production accountants.

STUDENT INTEREST (200 words)

Demand indication came directly from industry. The external consultation process clarified the target audience in that the microprogram is better positioned as an industry-specific upskilling of the Technique Comptable from CEGEP given the technical nature of the tasks of Production Accountants. In addition, graduates of Fine Arts programs or new students that are interested in obtaining financial and accounting skills in a degree format could find interest in completing the proposed microprogram.

CONSULTATION (200 words)

Internal consultation

The consultation process was sparked by industry feedback, which Dean Gérin received, on the shortage of Production Accountants. Subsequently, the internal consultation process involved Dean Croteau and Gérin, Associate Deans Janssen, Paterson, and Lim, and Department Chair Tekathen.

On a department-level, the accountancy department assembly was consulted on September 11, 2024 and on October 29, 2025. The Department Undergraduate Curriculum Committee discussed the proposal on November 25, 2024 and October 21, 2025. It approved the proposed microprogram and associated courses during the November 21, 2025 meeting.

The accountancy department assembly approved the proposed microprogram and associated courses on October 29, 2025.

The development of the microprogram was accompanied by Frédérica Martin, Manager, Programs, Internationalization and Sustainability, JMSB.

External consultation

List potential partners and stakeholders external to the university.

- Association québécoise de la production médiatique

The external consultation encompassed two industry focus group meetings, on focused on film (August 18, 2025) and one focused on television (August 19, 2025) to ensure that the proposed microprogram meets the knowledge and skill requirements of both sectors. The list of attendees of both focus group meetings can be found on the last page of this document.

RESOURCE REQUIREMENTS

This section is intended to detail the complete resources needed for the graduate microprogram to be successfully developed and implemented. Based on the information you provide below, the School of Graduate Studies will complete a budget.

1. STUDENT PROJECTION

	Year 1 May/June 2027	Year 2 May/June 2028	Year 3 May/June 2029	Year 4 May/June 2030	Year 5 May/June 2031
ACCO 250	20	25	25	28	28
ACCO 260	18	23	23	26	26

2. EXISTING CREDITS

Not applicable

3. NEW COURSE OFFERINGS OR SECTIONS

Two new 3-credit courses:

- ACCO 250 Film and TV Production Accounting (3 cr)
- ACCO 260 Financial Production Planning & Analysis in Film and TV (3 cr)

Offered once per academic year. Depending on demand, microprogram might be scheduled more than once per academic year subject to applicable course-level minimum enrollment threshold.

Each of the 3-credit courses will be co-taught between tenure-track faculty (1.5 credits) and part-time faculty member with industry expertise and experience (1.5 credits).

No new full-time hires.

4. GPD

The proposed microprogram will become part of the program portfolio of the Associate Dean, Undergraduate Programs, which houses all existing undergraduate programs at JMSB. The department of accountancy will supply the courses to offer the offered microprogram.

There will be no GPD for this program and no additional course remissions.

5. GPA

The proposed microprogram will rely on the existing GPAs. No additional compensation is planned.

6. ADDITIONAL RESOURCES

Software license for common production accounting software (e.g., Movie Magic, Génie Comptable). MS Office Suite (Excel, PPT, and Word) already available for students and instructors.

Illustrative Cost information - Movie Magic
Monthly Subscription Cost of Movie Magic Budgeting: approximately USD 40
Academic license available for Movie Magic Budgeting for approximately USD 120 per year.
Note: Multi-activation academic lab license available for a different module Movie Magic Scheduling. We can inquire whether something similar is possible for the module Budgeting.
Source: https://www.ep.com/ep-store/

Lowest cost version: Acquire two academic software licenses for the two instructors at USD 120 per year each (total of USD 240). Learners enrolled in the microprogram purchase their own software license as part of course material costs. There will be no textbook as course materials will be provided by the instructors.

TAships, following the applicable TA support policy for JMSB undergraduate courses. (For example, TA support only available for courses with greater than 25 students for undergraduate classes. TA support is ½ hour per student.)

Teaching space to offer the two courses.

Course materials will be prepared by the course instructors are part of their teaching workload/contract.

ITEMS THAT WILL NEED TO BE ADDED

- New course(s) syllabus(i)

Please find the course description in the CCMS Report and high-level course summaries of ACCO 250 and ACCO 260 attached.

- Curriculum map

The curriculum map is included in the high-level course summaries of ACCO 250 and ACCO 260 attached.

ITEMS THAT MAY NEED TO BE ADDED:

- Evidence of consultations with potential employers, industry or other external experts

Industry Focus Groups with Association québécoise de la production médiatique

Film Focus Group
18.08.2025 - Participants:

- Annie Gérin – Université Concordia
- Shauna Janssen - Université Concordia
- Jooseop Lim - Université Concordia
- Matthaeus Tekathen - Université Concordia
- Anne-Valérie Tremblay – Association québécoise de la production médiatique
- Anne-Marie Gélinas – Ema Films
- Amanda Gélinas-Noble – Ema Films (anciennement)

Television Focus Group
19.08.2025 - Participants:

- Annie Gérin – Université Concordia
- Shauna Janssen - Université Concordia
- Jooseop Lim - Université Concordia
- Matthaeus Tekathen - Université Concordia
- Anne-Valérie Tremblay – Association québécoise de la production médiatique
- Stéphanie Charles, Sphere Media
- Catherine Sauriol-Lacoste – Attraction Images

In addition, there have been earlier and ongoing conversations between Annie Gérin and Wylem Decaille, Association québécoise de la production médiatique.

- Industry/ community letters of support

Not included. Written letters of support have not been requested as the focus was on hosting focus group meetings in partnership with the Association québécoise de la production médiatique.

Summary Course Outline for New Courses in Microprogram in Production Accounting for Film and Television

Course Title

ACCO 250 Film and TV Production Accounting (3 cr)

Course Description

This course offers an applied introduction to the responsibilities of a film and television production accountant. Using practical examples, basic accounting principles, and software applications, learners develop competencies in key areas, including production cost reporting, accounts payable and reimbursement management, payroll processing, and compilation of tax credit information. Successful completion of this course provides the foundational skills necessary for a career in production accounting across the film, television, and creative sectors.

Course Prerequisite:

None

Learning objectives:

- Describethe roles and responsibilities of production accountants in film and television
- Apply appropriate accounting treatment for preparing production budgets, using standard accounting ledger and accounting software for film and television
- Apply appropriate accounting treatment for processing accounts payables, payroll, and other expenses, using applicable collective agreements and other relevant industry standards
- Apply appropriate accounting treatment for compiling tax credits that are common for film and television

Alignment with Program Objectives:

Program Learning Outcomes for Microprogram

By the end of the microprogram, learners:

1. Understand the roles and responsibilities of production accountants and of financial analysts in production accounting
2. Apply appropriate accounting treatment for preparing production budgets, for processing accounts payables, payroll, and other expenses, and for compiling tax credits that are common for film and television
3. Analyze production budgets to determine potential variances from budgeted costs

I = Introduce and R = Reinforce

Curriculum Map of Microprogram

Program Learning Outcomes	ACCO 250	ACCO 260
1. Understand the roles and responsibilities of production accountants and of financial analysts in production accounting	I for production accountants	I for financial analysts
2. Apply appropriate accounting treatment for preparing production budgets, for processing accounts payables, payroll, and other expenses, and for compiling tax credits that are common for film and television	I	R
3. Analyze production budgets to determine potential variances from budgeted costs	N/A	I

High-level session plan

Session	Topic
1	Introduction to Film and Television Production (e.g., Roles and Responsibilities, Phases, Key Terms and Technology)
2	The Roles and Responsibilities of the Production Accountant (e.g., payroll, accounts payables, bookkeeping, cash account, working with the production budget)
3	Basic Accounting Principles (e.g., double-entry bookkeeping system, the accounting cycle, balance sheet, income statement, and cashflow statement)
4	Reporting Production Costs, using Standard Accounting Ledger & Accounting Software for Film and Television Production
5	Focus topics: Handling Accounts Payable (e.g., purchase orders, invoice verification and payment, associated accounting records in accounting software)
6	Working with Different Collective Agreements in Production Accounting
7	Focus topics: Handling Payroll – Part 1 (e.g., prepare and process payroll in accordance with collective agreement and legal standards, associated accounting records in accounting software)
8	Focus topics: Handling Payroll – Part 2 (e.g., prepare and process payroll in accordance with collective agreement and legal standards, associated accounting records in accounting software)
9	Focus topics: Handling advances, credit cards, and petty cash accounts (e.g., prepare and process these transactions and record them in the accounting software)
10	Focus topics: Handling reimbursements through expense, mileage, per-diem, and other reports (e.g., validate and process these transactions and record them in the accounting software)
11	Focus topics: Compiling information for tax credits
12	Summary & Wrap-Up

Assessment

- Participation (20%)
- Quizzes (20%)
- Applied Group Project (30%)
- Final Exam (30%)

Potential teaching faculty

Kai DeMott (full-time faculty) and Nicholas Spcier (part-time faculty)

Summary Course Outline for New Courses in Microprogram in Production Accounting for Film and Television

Course Title

ACCO 260 Financial Production Planning & Analysis in Film and TV (3 cr)

Course Description

This course provides an applied understanding of financial planning and analysis of production projects. Using practical examples, basic management accounting principles and software applications, learners acquire skills in preparing, analyzing, and controlling production budgets. They further learn about sources of production financing and subsidies as well as post-production tasks, including inventory tracking and assisting the audit process. Successful completion of this course provides the necessary foundational competencies to perform financial planning and analysis tasks for production projects in the film, television, and other creative industries.

Course Prerequisite:

None

Learning objectives:

- Describe the roles and responsibilities of financial analysts in production accounting
- Explain what the sources of production financing and subsidies are
- Analyze production budgets to determine potential variances from budgeted costs and derive potential correction actions
- Apply inventory tracking and other post-production tasks

Alignment with Program Objectives:

Program Learning Outcomes for Microprogram

By the end of the microprogram, learners:

1. Understand the roles and responsibilities of production accountants and of financial analysts in production accounting
2. Apply appropriate accounting treatment for preparing production budgets, for processing accounts payables, payroll, and other expenses, and for compiling tax credits that are common for film and television
3. Analyze production budgets to determine potential variances from budgeted costs

I = Introduce and R = Reinforce

Curriculum Map of Microprogram

Program Learning Outcomes	ACCO 250	ACCO 260
1. Understand the roles and responsibilities of production accountants and of financial analysts in production accounting	I for production accountants	I for financial analysts
2. Apply appropriate accounting treatment for preparing production budgets, for processing accounts payables, payroll, and other expenses, and for compiling tax credits that are common for film and television	I	R
3. Analyze production budgets to determine potential variances from budgeted costs	N/A	I

High-level session plan

Session	Topic
1	The Roles and Responsibilities of the Financial Analysts in Production Accounting
2	Basic Management Accounting Principles (e.g., cost classification, decision-making concepts, Cost-Volume-Profit, profitability analysis)
3	Introduction to Planning and Control (e.g., budgeting basics, variance analysis, forecasts, and corrective actions)
4	Preparing a Production Budget
5	Analyzing a Production Budget
6	Focus topics: Cost Report
7	Focus topics: Addressing Cost Variances through Corrective Actions
8	Focus topic: Inventory Tracking
9	Focus topic: Sources of Production Financing & Subsidies
10	Focus topic: Post-production tasks
11	Focus topics: Assisting the audit process
12	Summary & Wrap-Up

Assessment

- Participation (20%)
- Quizzes (20%)
- Applied Group Project (30%)
- Final Exam (30%)

Potential teaching faculty

Kai DeMott (full-time faculty) and Nicholas Spcier (part-time faculty)

Microprogram in Production Accounting for Film and Television in Collaboration with FOFA

Updated Proposal

October 23, 2025

Microprogram for Production Accounting in Film and Television

Learning objective: To provide learners with the necessary applied accounting knowledge to work in the area of Production Accounting in film and television.

Target audience:
- Upskilling opportunity for those in industry or those with a Technique Comptable from CEGEP that may need the extra to get into the industry.
- Graduates of Fine Arts programs who want an 'add on' production accounting knowledge to their degree,
- New students wanting to acquire specific accounting/financial skills in the area of production accounting.

Overview:
- 3 credits core with the option to take a second 3-credit course

- Production Accounting:
  - Financial Accounting in the context of production accounting
  - Production Accounting Ledger
  - Production Accounting Software
  - Payrolls, Unions and Issues of Taxation
  - Accounts Payable and Supplies
  - Credit card and petty cash accounts
  - Reimbursements through expense, mileage, per-diem, and other reports

- Optional Top-Up: Financial Production Planning & Analysis:
  - Preparing a Production Budget
  - Controlling a Production Budget
  - Cost Reporting
  - Inventory Tracking
  - Production financing
  - Subsidies
  - Post-Production Audit

Core:

ACCO 250
Film and TV Production Accounting
new 3-cr course

Optional Top-Up:

ACCO 260
Financial Production Planning & Analysis in Film and TV
new 3-cr course

Course Descriptions

- See Attachments

ACCO 250 Production Accounting – Session Plan

Session Plan
1. Introduction to Film and Television Production (e.g., Roles and Responsibilities, Phases, Key Terms and Technology)
2. The Roles and Responsibilities of the Production Accountant (e.g., payroll, accounts payables, bookkeeping, cash account, working with the production budget)
3. Basic Accounting Principles (e.g., double-entry bookkeeping system, the accounting cycle, balance sheet, income statement, and cashflow statement)
4. Reporting Production Costs, using Standard Accounting Ledger & Accounting Software for Film and Television Production
5. Focus topics: Handling Accounts Payable (e.g., purchase orders, invoice verification and payment, associated accounting records in accounting software)
6. Working with Different Collective Agreements in Production Accounting
7. Focus topics: Handling Payroll – Part 1 (e.g., prepare and process payroll in accordance with collective agreement and legal standards, associated accounting records in accounting software)
8. Focus topics: Handling Payroll – Part 2 (e.g., prepare and process payroll in accordance with collective agreement and legal standards, associated accounting records in accounting software)
9. Focus topics: Handling advances, credit cards, and petty cash accounts (e.g., prepare and process these transactions and record them in the accounting software)
10. Focus topics: Handling reimbursements through expense, mileage, per-diem, and other reports (e.g., validate and process these transactions and record them in the accounting software)
11. Focus topics: Compiling information for tax credits
12. Summary & Wrap-Up

ACCO 250 - Course Assessment:

- Participation (20%)
- Quizzes (20%)
- Applied Group Project (30%)
- Final Exam (30%)

ACCO 260 Financial Production Planning & Analysis – Session Plan

Session Plan
1. The Roles and Responsibilities of the Financial Analysts in Production Accounting
2. Basic Management Accounting Principles (e.g., cost classification, decision-making concepts, Cost-Volume-Profit, profitability analysis)
3. Introduction to Planning and Control (e.g., budgeting basics, variance analysis, forecasts, and corrective actions)
4. Preparing a Production Budget
5. Analyzing a Production Budget
6. Focus topics: Cost Report
7. Focus topics: Addressing Cost Variances through Corrective Actions
8. Focus topic: Inventory Tracking
9. Focus topic: Sources of Production Financing & Subsidies
10. Focus topic: Post-production tasks
11. Focus topics: Assisting the audit process
12. Summary & Wrap-Up

ACCO 260 - Course Assessment:

- Participation (20%)
- Quizzes (20%)
- Applied Group Project (30%)
- Final Exam (30%)

Notes to both Courses

- The course will be applied, using a production case and a common production accounting software to experience the role as production accountant hands-on

- Course scheduling: The course needs to be scheduled in a way that caters to working students (e.g., intensive course over 2 weeks or Fridays/Saturdays over 3 weeks or blended versions (Zoom teaching with in-person Fridays/Saturdays)

- Co-teaching possibility with accountancy faculty and industry expert
- Association québécoise de la production médiatique offered their help in recruiting industry experts as instructor

- Open discussion point: After a first program cohort, we assess whether students that have no prior basic accounting knowledge succeed in the new Production Accounting course or whether we need to require that they take the Introduction to Financial Accounting course (ACCO 220) before the new Production Accounting course.

Market Research

Existing Program: Production Accounting for Film and Television (Schulich Exec Education-York University)

- Micro-credential program
- “Jump Start Your Production Accounting Career
- Gain entry-level certification in production accounting film and TV productions. Over six weeks, learn the fundamentals of the production workflow from the perspective of the accounting department. Developed with top-level production accountants and industry experts, this program will provide you with a comprehensive understanding of accounting in film ar TV and provide the opportunity to enter a sustainable career in this high-demand department of the sector.”

https://execed.schulich.yorku.ca/program/production-accounting-for-film-and-television/

https://www.yorku.ca/yfile/2023/04/06/york-launches-production-accounting-micro-credential-program/

https://cinespace.com/production-accounting-micro-credential-program/

Program Overview	Concorida Course Coverage
Introduction to the Film Industry	→ Covered in new course Production Accounting
Introduction to Bookkeeping	→ Covered in new course Production Accounting
Payrolls, Unions & Tax Credits	→ Covered in new course Production Accounting
Budgets & Cost Reporting	→ Covered in the second new course Financial Production Planning & Analysis
Inventory Tracking/Post-Production	→ Covered in the second new course Financial Production Planning & Analysis
Course Wrap-Up and Review	

Existing Program: Micro-credential course - Film and Television Production Accounting Basic Skills (Centennial College, Toronto)

- Micro-credential course:

  “This Film and Television Production Accounting Basic Skills micro-credential course will give students practical experience with compiling key accounting documents and reports that are specific for the film and television industry.

  As mid-career professionals in the film and television industry, students will adapt their skills to work in the production accounting department, or for mid-career bookkeeping or accounting professionals in other industries to adapt their skills for the film and television industry.

  Rooted in core accounting principles as required by the Canadian Revenue Agency, students will utilize the skills for coordinating payroll, preparing cost reports and petty cash reports, and compiling materials for tax credit filings and audit.

  In this course, students will have intensive practical experience through a combination of analysis of readings followed by hands on preparing of accounting materials as expected in the film and television production accounting department.”

- https://db2.centennialcollege.ca/ce/coursedetail.php?CourseCode=FTPA-100

Industry Focus Groups (with Association québécoise de la production médiatique)

Film Focus Group

18.08.2025 - Participants:

- Annie Gérin – Université Concordia
- Shauna Janssen - Université Concordia
- Jooseop Lim - Université Concordia
- Matthaeus Tekathen - Université Concordia
- Anne-Valérie Tremblay – Association québécoise de la production médiatique
- Anne-Marie Gélinas – Ema Films
- Amanda Gélinas-Noble – Ema Films (anciennement)

Television Focus Group

19.08.2025 - Participants:

- Annie Gérin – Université Concordia
- Shauna Janssen - Université Concordia
- Jooseop Lim - Université Concordia
- Matthaeus Tekathen - Université Concordia
- Anne-Valérie Tremblay – Association québécoise de la production médiatique
- Stéphanie Charles, Sphere Media
- Catherine Sauriol-Lacoste – Attraction Images

Additional: Earlier conversations between Annie Gérin and Anne Wylem Decaille - Association québécoise de la production médiatique

CONCORDIA

Existing UG Microprograms at Concordia

- https://www.concordia.ca/academics/microprograms.html

General Admission Information for UG Microprograms

Admissions

- We welcome candidates with non-traditional career paths or those who do not necessarily possess a university or college degree.

Eligibility and requirements

- Open to Canadian citizens and permanent residents **only**.
- Students already registered in an undergraduate program at Concordia are **ineligible.**
- You do not need a previous degree or diploma to be accepted.

Admission Requirement for Microprogram in Production Accounting for Film and Television

Admission requirements

- This microprogram welcomes candidates from diverse professional and educational backgrounds who are interested in getting a jump start on a career as production accountant.
- Only Canadian citizens and permanent residents are eligible to apply.
- No previous degree or diploma required for acceptance.
- Students already registered in an undergraduate program at Concordia are **ineligible** for the Microprogram but may be eligible to enrol into the courses as part of their **elective courses**, if applicable.

Inspired from: Microprogram in Fundamentals of Digital Filmmaking, except for last bullet point modified from Sustainability Principles Microprogram https://www.concordia.ca/finearts/cinema/programs/digital-filmmaking.html#admission

Recent Job Postings as Production Accountant

- See PDFs (appendix + inserted as files below)



Adobe Acrobat Document



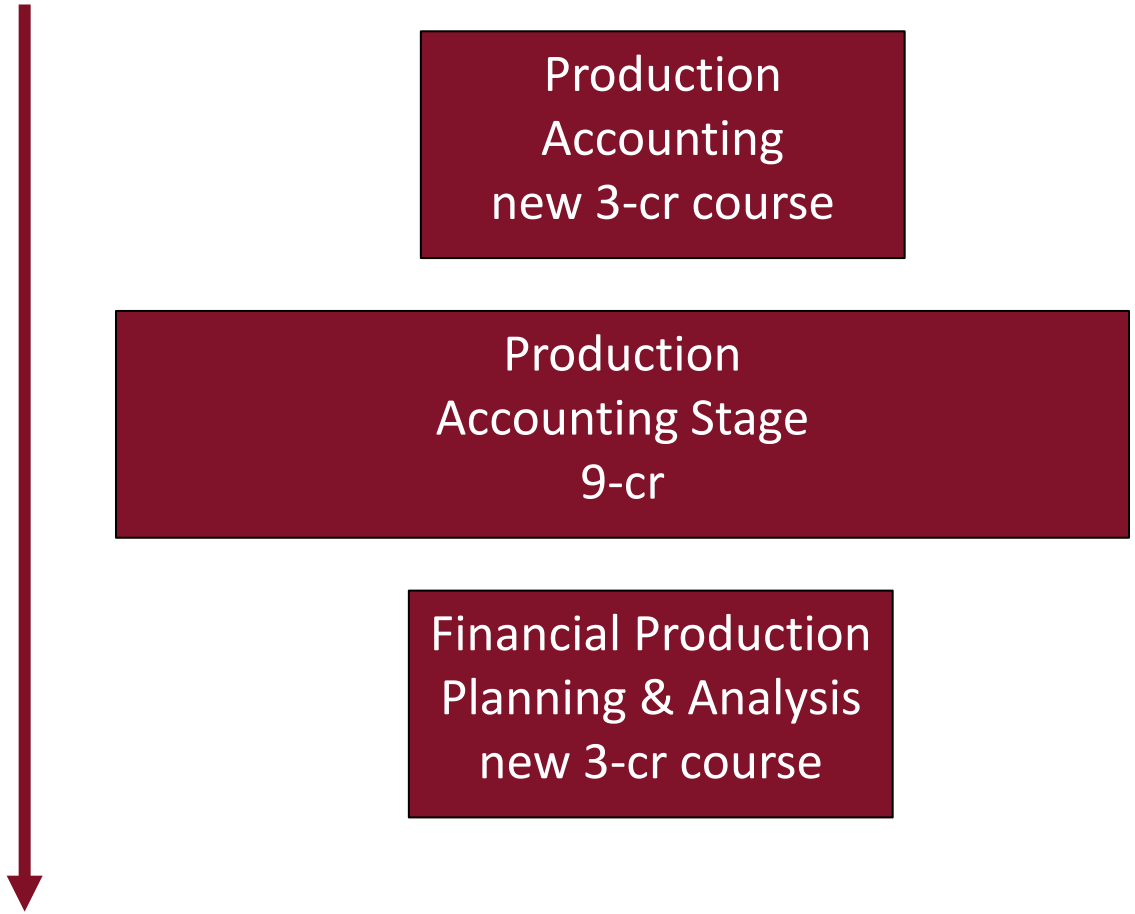
Adobe Acrobat Document

CONCORDIA

Outlook if continued demands for micro-programme

CONCORDIA

Expansion possibility: Certificate in Production Accounting (15 credits)



Learning objective: To provide learners with the necessary applied accounting knowledge to be successful in the area of Production Accounting and Financial Planning & Analysis for film and television.

Target audience:

- Upskilling opportunity for those in industry or those with a Technique Comptable from CEGEP and may need the extra to get into the industry.
- Graduates of Fine Arts programs who want an 'add on' to their degree,
- New students wanting to acquire specific accounting/financial skills in the area of production accounting.

Overview:

- 6-credits course work

- 9-credits accounting stage
  - 6-month work assignment or internship as production accountant
  - To be discussed: Shall it run as supervised project?

Outlook: Both courses can be integrated in a possible program for Production Managers in Entertainment Industries



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Back-up

- National association of production accountants http://www.napaus.org/about
- https://www.indeed.com/career-advice/finding-a-job/how-to-become-production-accountant
- https://academy.ep.com/production-accounting-101
- https://reelcanada.ca/reel-opportunities/careers-in-film/careers/production-accountant/

CONCORDIA

CONCORDIA.CA

INTERNAL MEMORANDUM
CONCORDIA UNIVERSITY
JOHN MOLSON SCHOOL OF BUSINESS

TO: Dr. Sandra Betton
Chair, Faculty Academic Programs Committee

FROM: Dr. Jooseop Lim, Associate Dean, Undergraduate Programs

DATE: January 27, 2026

SUBJECT: Proposed Microprogram in Production Accounting for Film and Television

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The Undergraduate Curriculum Committee (UCC) reviewed and approved the proposed microprogram in Production Accounting for Film and Television on January 23, 2026. The proposal was unanimously approved, with four (4) votes in favor, zero (0) opposed, and zero (0) abstentions. This approval includes the creation of the associated courses, ACCO 250 (Financial Production Planning & Analysis in Film and Television) and ACCO 260 (Financial Production Planning and Analysis in Film and Television).

The Committee expressed its appreciation for the development of a program that responds directly to the needs identified by industry partners. Members also highlighted the strong and complementary collaboration between the Mel Hoppenheim School of Cinema and the Department of Accountancy in the John Molson School of Business.

In light of the admission requirements and the targeted skill set of the program, the Committee recommended adding a note indicating that JMSB students are not permitted to take ACCO 250 and ACCO 260 for credit.

Thank you.

INTERNAL MEMORANDUM

To: Dr. Jooseop Lim, Associate Dean Academic & Student Affairs, Undergraduate Programs

From: Dr. Matthäus Tekathen, Chair, Department of Accountancy

Date: December 18, 2025

Subject: **Proposed Microprogram in Production Accounting for Film and Television and the associated courses ACCO 250 and ACCO 260**

Members of the Department of Accountancy approved the recommendations of the Department Undergraduate Curriculum Committee regarding the creation of the 6-credit Microprogram in Production Accounting for Film and Television and the associated courses ACCO 250 and ACCO 260 in their meeting on October 29, 2025. The department undergraduate curriculum committee in the Department of Accountancy approved the proposed microprogram and new courses in their meeting on October 21, 2025.

The 6-credit microprogram in Production Accounting for Film and Television provides learners with the necessary applied accounting knowledge and skills to work as Production Accountant in the film and television industry. Industry partners of the Faculty of Fine Arts and the Mel Hoppenheim School of Cinema as well as the Association québécoise de la production médiatique have consistently expressed that there is a shortage of qualified Production Accountants in film and television. The microprogram addresses this qualification shortage.

The proposed microprogram builds on the strong reputation of the Mel Hoppenheim School of Cinema and the Department of Accountancy. Both are recognized leaders in their fields. While hosed at the John Molson School of Business, the proposed microprogram is planned to be offered in collaboration with the Faculty of Fine Arts.

Please find the relevant documents attached.

I ask that you kindly move the proposed microprogram and associated courses to the next meeting of the Undergraduate Curriculum Committee for processing. I thank you and the UCC for looking into this matter. Please do not hesitate to contact me in case of questions.

Best regards,

M. Tekathen

Matthäus Tekathen, Department Chair, Accountancy

FACULTY OF FINE ARTS

February 24, 2026

Subject: Letter of Support – Undergraduate Microprogram in Production Accounting for Film and Television (JMSB)

Dear Dr Rachel Berger, Vice Provost, Innovation in Teaching and Learning,

I am pleased to offer my support, on behalf of the Faculty of Fine Arts, for the development of the *Undergraduate Microprogram in Production Accounting for Film and Television* in the Department of Accountancy at Concordia's John Molson School of Business.

This proposed 6 credit microprogram represents a meaningful opportunity to strengthen cross-faculty collaboration while expanding the professional competencies and sectoral literacies available to students across the University.

I understand that the associated FTEs required to deliver this microprogram will be funded 100% by JMSB. As such, FoFA does not anticipate any financial impact arising from its implementation.

The Faculty of Fine Arts is committed to supporting the visibility and recruitment efforts associated with this microprogram, as appropriate. This includes:

- Supporting the initiative through the facilitation of letters of support from relevant cultural and production sector stakeholders, where appropriate;
- Promoting the microprogram through Faculty communication channels, including newsletters and website features;
- Encouraging academic advisors and program directors to inform eligible Fine Arts students of this opportunity;
- Supporting outreach through recruitment events, information sessions, and relevant cross faculty initiatives.

Please do not hesitate to contact my office should further information be required.

Sincerely,



Annie Gérin
Dean, Faculty of Fine Arts

To: Effrosyni Diamantoudi, i/Provost and Vice-President, Academic

From: Anne-Marie Croteau, Dean, John Molson School of Business

Copy Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Annie Gérin, Dean, Faculty of Fine Arts

Jooseop Lim, Associate Dean, Undergraduate Programs

Matthäus Tekathen, Chair of the Accountancy Department and Director of the CPA Program

Date: March 12, 2026

Subject: Endorsement—Microprogram in Production Accounting for Film and Television (6 credits)

Dear Faye,

I am pleased to convey my full support for the Microprogram in Production Accounting for Film and Television (6 credits).

The proposed 6 credit microprogram has been developed in collaboration with the Faculty of Fine Arts and is a stellar example of cross-faculty collaboration. The program responds to the needs identified by industry partners and provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry.

I confirm that JMSB will allot the required resources to offer the two new courses for this program and recommend approval for a Winter 2027 launch.

Lettre de soutien

Madame Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de L'AGENCE CLAUDE GIRARD je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein ou à certains artistes qui veulent parfaire leur connaissance.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,



Claude Girard

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia. J'ai longtemps travaillé à Radio-Canada et dans le milieu privé de la production télévisuelle et cinématographique au Canada et à l'international. Je travaille depuis huit ans avec la société de production autochtone Nikan (aka Terre Innue) et son OBNL Nikan Héritage.

Ce programme répond à des besoins criants et urgents que vit au quotidien, notre industrie. La recherche et la pénurie de comptables de production deviennent bien souvent un frein à l'essor de nos projets et de nos compagnies.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.
Je vous souhaite tout le succès possible.

Francine Allaire

Francine Allaire
Productrice exécutive, Nikan Productions et consultante cinéma. Télévision, médias numériques
allaire.fra@gmail.com
514-983-2290

Montréal, le 24 février 2026

À: **Annie Gérin, PhD**
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Objet : Lettre de soutien

Chère madame la Doyenne,

Au nom de l'équipe d'Allia, l'Alliance des femmes des industries créatives (anciennement FCTMN), je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Selon moi, voici les principaux atouts du programme proposé :

- La concision du programme et la possibilité pour les étudiants de le terminer rapidement.
- La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.
- Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.
- Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.
- L'expertise du corps professoral de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à me contacter si vous avez des questions.

Je vous adresse, Madame, mes sincères salutations.

Cordialement,



Marie-Laure M. Rozas
Présidente du conseil d'administration
info@allia-qc.org

association
des producteurs
publicitaires

Lettre de soutien

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de l'Association des Producteurs Publicitaires, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,



Magali Loiselle
Directrice générale
Association des Producteurs Publicitaires
mloiselle@appqc.ca

Montréal, le 24 février 2026

Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Objet: Lettre de soutien au microprogramme en comptabilité de production pour le cinéma et la télévision

Madame la Doyenne,

L'Association québécoise de la production médiatique (AQPM) représente, conseille et accompagne plus de 150 entreprises de production indépendantes du Québec œuvrant en français, en anglais et dans les langues autochtones à la production de contenus télévisuels, cinématographiques et web pour toutes les plateformes.

La présente confirme l'appui de l'AQPM à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia. Les objectifs d'apprentissage des cours et du programme répondent à un besoin immédiat de l'industrie.

Anne-Valérie Tremblay, responsable financement et services aux membres de l'AQPM a eu l'opportunité de suivre la démarche de l'équipe de travail de Concordia dans l'élaboration du programme. Nous sommes convaincus que l'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) permettra aux étudiants de développer les compétences pratiques nécessaires à leur réussite dans le domaine. De plus, la concision du programme, la flexibilité des horaires et son accessibilité à un large éventail d'étudiants incluant ceux qui travaillent déjà dans l'industrie sans diplôme universitaire accélèreront le recrutement de personnel qualifié pour les entreprises de production.

Cordialement,

Hélène Messier
Présidente-directrice générale

Montréal, le 23 février 2026

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de de la maison de production ATTRACTION, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,

Antonello Cozzolino
VP Fictions et long métrage
Attraction

BUREAU DU **CINÉMA** ET DE
LA **TÉLÉVISION** DU QUÉBEC

LETTRE DE SOUTIEN
24 février 2026

Objet : Lettre d'appui – Microprogramme en comptabilité de production pour le cinéma et la télévision

Madame Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515, rue Sainte-Catherine Ouest
Montréal (Québec) H3H 1M8

Madame Annie Gérin,

Au nom du Bureau du cinéma et de la télévision du Québec (BCTQ), je souhaite exprimer notre appui à la création du microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Cette initiative répond à un besoin réel et structurant pour l'industrie audiovisuelle du Québec. Dans un contexte où les montages financiers se complexifient, où les sources de financement se diversifient et où les exigences fiscales et budgétaires s'intensifient, la formation de professionnels spécialisés en comptabilité de production constitue un levier important de performance et de compétitivité.

La comptabilité de production est au cœur de la saine gestion des projets et de la conformité aux exigences des bailleurs de fonds. Renforcer cette expertise contribue directement à la solidité, à la crédibilité et à l'attractivité de notre industrie.

Nous sommes également sensibles aux échanges en cours avec la Guilde canadienne des réalisateurs visant à intégrer les réalités spécifiques de la production étrangère au Québec dans le développement du programme, et saluons cette démarche d'arrimage avec l'ensemble des besoins du marché.

Nous saluons particulièrement :

- La concision et la structure ciblée du programme, permettant aux participants d'acquérir rapidement des compétences spécialisées et directement applicables aux productions ;
- La flexibilité des modalités et de l'horaire des cours, qui répond aux contraintes des professionnels en activité et favorise l'accessibilité pour un large éventail de profils ;

- L'alignement clair des objectifs d'apprentissage avec les besoins opérationnels immédiats de l'industrie, tant en matière de gestion des coûts que de planification et de contrôle budgétaire ;
- Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à des étudiants, à des professionnels en reconversion ou en perfectionnement, ainsi qu'à des travailleurs de l'industrie sans diplôme universitaire ;
- L'expertise complémentaire du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB), garantissant une formation à la fois rigoureuse sur le plan financier et ancrée dans les réalités concrètes du milieu audiovisuel.

Le développement de compétences spécialisées en comptabilité de production renforcera la capacité d'exécution des productions au Québec, soutiendra la relève et consolidera un maillon stratégique de notre écosystème. Il s'agit d'un investissement direct dans la solidité et la pérennité de l'industrie audiovisuelle du Québec.

Nous vous remercions pour cette initiative structurante et demeurons disponibles pour toute discussion complémentaire.

Veuillez agréer, Madame la Doyenne, l'expression de mes salutations distinguées.



Stéphane Cardin
Président-directeur général
Bureau du cinéma et de la télévision du Québec

Lettre de soutien (English version below)

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

À titre de réalisateur œuvrant depuis 25 ans dans l'industrie et impliqué dans la mise en valeur de l'intelligence artificielle au sein de notre Faculté, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

L'industrie audiovisuelle traverse une transformation accélérée de ses méthodes de création. J'ai d'ailleurs récemment assisté aux conclusions du premier cours d'intelligence artificielle à l'INIS, où la satisfaction et l'engouement face à ces nouveaux flux de travail étaient indéniables. L'innovation technologique redéfinit nos plateaux, et la gestion de production doit impérativement s'adapter à cette nouvelle agilité. En ce sens, les objectifs d'apprentissage des cours et du programme répondent à un besoin immédiat de l'industrie.

Voici, selon moi, les principaux atouts du programme proposé : • La concision du programme et la possibilité pour les étudiants de le terminer rapidement. • La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein. • Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire. • L'expertise du corps professoral de la Faculté des beaux arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,

Christian Beltrami

Réalisateur et Expert en résidence, IA et créativité Université Concordia



To: Annie Gérin, PhD
Dean, Faculty of Fine Arts
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dean Gérin,

As a director with 25 years of experience in the industry and a researcher involved in the integration of artificial intelligence within our Faculty, I am writing this letter to express my support for the development of an Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University.

The audiovisual industry is going through an accelerated transformation of its creation methods. I recently attended the conclusions of the first artificial intelligence class at l'INIS, where the satisfaction and enthusiasm for these new workflows were undeniable. Technological innovation is redefining our sets, and production management must adapt to this new agility. In this sense, the learning objectives of the courses and program address an immediate need in industry.

I see the following as key strengths of the proposed program: • The compact nature of the program and ability for students to complete the courses and program in a short time frame. • The flexibility of the scheduling of courses to suit a wide variety of students, including those with full time jobs. • The positioning of the program as an Undergraduate microprogram making it accessible to a wide range of students, including those in industry without an undergraduate degree. • The expertise of faculty at JMSB and the Faculty of Fine Arts in providing students with the practical skills to be successful in the field.

Please do not hesitate to contact me if you have any questions.

Regards,

Christian Beltrami

Video Director and Expert in Residence, AI and Creativity Concordia University



Outlook

TR : Request for a letter of support: Microprogram in Production Accounting for Film and Television

From Annie Gerin <annie.gerin@concordia.ca>
Date Tue 2026-02-24 16:02
To Academic Facilitator Fine Arts <fineartscurriculum@concordia.ca>

Annie Gérin
Dean | Doyenne
Faculty of Fine Arts | Faculté des Beaux-arts
Concordia University | Université Concordia

De : Don Carmody <don@doncarmody.com>
Envoyé : 24 février 2026 13:27
À : Annie Gerin <annie.gerin@concordia.ca>
Objet : Re: Request for a letter of support: Microprogram in Production Accounting for Film and Television

Attention This email originates from outside the concordia.ca domain. // Ce courriel provient de l'extérieur du domaine de concordia.ca

Dear Annie:

Happy to support this initiative. Here is my letter of support:

I have recently been made aware of a new program at Concordia from the John Molson School of Business in Concert with the Faculty of Fine Arts to start an Undergraduate Course entitled, “Undergraduate Microprogram in Production Accounting for Film and Television”. As a graduate of Loyola (now Concordia’s) Communication Arts Department and an independent Film Producer of some 140 Films and Television Programs over 50 years in the Industry, I can attest to the urgent and continuing need in the Canadian Film and Television Industry for trained Production Accountants and support staff, like Auditors, Assistant Production Accountants, Post Production Accountants, Accounting Clerks, Payroll Accountants and the like.

One of my daughters was actually a Post Production Accountant for many years and had to find other accounting opportunities when she moved from the Toronto area to another area closer to her residence. She could also attest to the continuing need for well-trained people in this area of expertise. These opportunities extend to both male and females and offer some of the longer duration employment opportunities in a generally free lance business. Many permanent opportunities with production

companies, networks, streamers, etc are also available. These are high paying jobs, especially for well-trained people and the opportunity for advancement is there as well.

Many are represented by either the Directors Guild of Canada or the international Alliance of Theatrical Stage Employees. In the United States many are represented by the Teamsters Union so in either country the benefits are very generous. Believe me, there is no “Closed Shop” for these people! There are also positions available for Independent or non-union Accounting staff throughout the Industry. These positions are available right across the country in both production hubs like Toronto, Montreal, Vancouver, but also regional centers throughout North America and frankly around the world. The opportunities for travel, especially for top freelancers is also available.

I cannot stress enough the need for these types of well-trained Accounting staff. While my experience over the many years has taken place all over the world, the availability of Production Accountants of all types and levels has been acute during my entire career.

Please feel free to contact me should you require further support for this invaluable training program.

Sincerely,

E Donald Carmody
Class of 1972

From: Annie Gerin <annie.gerin@concordia.ca>
Date: Monday, February 23, 2026 at 3:54 PM
To: Don Carmody <don@doncarmody.com>
Subject: Request for a letter of support: Microprogram in Production Accounting for Film and Television

Dear Don,

The Department of Accountancy, at Concordia’s John Molson School of Business (JMSB) is developing an *Undergraduate Microprogram in Production Accounting for Film and Television.* The microprogram has been developed based on industry feedback, program benchmarking, an analysis of job postings and information gathered through focus groups.

Here are key components of the proposed program:

Course duration and structure
To complete the 6-credit microprogram, the student is required to complete two new three-credit courses:
• **ACCO 250** Film and TV Production Accounting (3 credits)
• **ACCO 260** Financial Production Planning & Analysis in Film and TV (3 credits)
Each course is offered in a three-week format to cater to working and non-working learners, includes evening sessions combining a mix of in-person, synchronous, online and hyperflex teaching formats to offer maximum accessibility for students.

Program description and objectives
The *Microprogram in Production Accounting for Film and Television* provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. During the first three-week course, learners acquire the key competencies necessary for the role, ranging from reporting production costs and handling accounts payable, to processing reimbursements and payroll. During the second three-week course, learners acquire key competencies to perform financial planning and analysis tasks with a focus on preparing, analyzing, and controlling

production budgets. The microprogram positions learners to launch or transition into a successful career in the dynamic and demanding field of production accounting in film and television.

Targeted students
The microprogram is targeted at three main groups:

1. As an upskilling opportunity for those in industry or those with a Technique Comptable from CEGEP who may need extra training to enter the industry.
2. Graduates/alumni of Fine Arts programs who want an 'add on' to their degree.
3. New students wanting to acquire specific accounting and financial skills in the area of production accounting.

I have been a participant in the focus groups assembled as part of the program development and in ongoing conversations with the *Association québécoise de la production médiatique* and believe that this new microprogram represents an exciting collaboration between the John Molson School of Business and the Faculty of Fine Arts and that addresses an immediate need in industry. We envisage a future expansion of the program into a 15-credit Certificate in Production Accounting and the possibility of the proposed courses in the new microprogram as part of a future program for Production Managers in the Entertainment Industries.

I am reaching out to you as a key player in this field to request a letter of support for this new program and are happy to discuss it if you would like to know more. I have provided an example template in attachment for your convenience.

Wishing you all the very best,
Annie

Annie Gérin
Dean | Doyenne
Faculty of Fine Arts | Faculté des Beaux-arts
Concordia University | Université Concordia

Caroline Jeuris, caroline.jeuris@concordia.ca
Executive Secretary | Secrétaire executive



50 years: Forever Forward/ 50 ans de savoirs, 50 ans d'avenirs.
concordia.ca/50

I acknowledge that Concordia University is located on unceded Indigenous lands. The Kanien'kehá:ka Nation is recognized as the custodians of the lands and waters we now call Montreal. | Je reconnais que l'Université Concordia est située en territoire autochtone non cédé et que la nation Kanien'kehá:ka est la gardienne des terres et des eaux formant aujourd'hui Montréal. [Indigenous Directions Leadership Group, Concordia University, 2017]

To:
Annie Gérin, PhD
Dean, Faculty of Fine Arts
Concordia University
1515 Ste. Catherine West, Montreal, QC H3H 1M8

Letter of Support

Dear Dean Annie Gérin,

On behalf of Champlain Media, I am pleased to express our strong support for the development of an Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University.

We believe this proposed program offers several key strengths:

- The compact structure of the microprogram, enabling students to complete the courses within a short and focused timeframe.
- The flexible course scheduling, designed to accommodate a diverse student population, including those working full-time.
- The clearly defined learning objectives, which respond directly to an immediate and growing need within the industry.
- The positioning of the program as an undergraduate microprogram, making it accessible to a broad range of students, including industry professionals who may not hold an undergraduate degree.
- The expertise of the faculty at JMSB in equipping students with the practical, industry-relevant skills necessary for success in this field.

We are confident that this program will make a meaningful contribution to the film and television industry and will help address current workforce demands.

Please do not hesitate to contact me should you require any additional information.

Sincerely,

Tom Berry
Chairman – Champlain Media
tberry@champlainmedia.ca

MELS

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de MELS, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,

Patrick Jutras

Patrick Jutras
Président de MELS

MELS

To: Annie Gérin, PhD
Dean, Faculty of Fine Arts
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dean Gérin,

On behalf of MELS, I am writing this letter to express my support for the development of a Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University.

I see the following as key strengths of the proposed programs:

- The compact nature of the program and ability for students to complete the courses and program in a short time frame.
- The flexibility of the scheduling of courses to suit a wide variety of students, including those with full-time jobs.
- The learning objectives of the courses and program that address an immediate need in industry.
- The positioning of the program as an Undergraduate microprogram making it accessible to a wide range of students, including those in industry without an undergraduate degree.
- The expertise of faculty at JMSB and the Faculty of Fine Arts in providing students with the practical skills to be successful in the field.

Please do not hesitate to contact me if you have any questions.

Regards,

Patrick Jutras
Patrick Jutras

President of MELS

MUSE

ENTERTAINMENT ENTERPRISES INC.

On behalf of Muse Entertainment Enterprises Inc., I am writing this letter to express my support for the development of a Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University. Our company is a frequent producer of television movies and programs across Canada, including in Montreal, Toronto, Ottawa, Vancouver, Victoria and Halifax, and are very much in need of qualified production accountants who are often in high demand.
I see the following as key strengths of the proposed programs:

- The compact nature of the program and ability for students to complete the courses and program in a short time frame.
- The flexibility of the scheduling of courses suits a wide variety of students, including those with full-time jobs.
- The learning objectives of the courses and program that address an immediate need in industry.
- The positioning of the program as an Undergraduate microprogram making it accessible to a wide range of students, including those in industry without an undergraduate degree.
- The expertise of faculty at JMSB in providing students with the practical skills to be successful in the field.

Please do not hesitate to contact me if you have any questions.

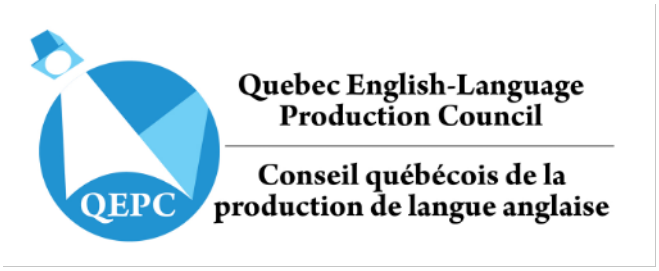
Regards,

Muse Entertainment Enterprises Inc.

Per _____
Michael Prupas
Chairman and Founder

345 Victoria Ave, suite 500 Westmount, QC H3Z 2N1 • TEL (514) 866-6873 • FAX (514) 866-3911 • WWW.MUSE.CA

MONTREAL • TORONTO • VANCOUVER • LOS ANGELES



To: Annie Gérin, PhD
Dean, Faculty of Fine Arts
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dean Gérin,

On behalf of the Quebec English-language Production Council (QEPC), I am writing this letter to express my support for the development of a Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University.

I see the following as key strengths of the proposed programs:

- The compact nature of the program and ability for students to complete the courses and program in a short time frame.
- The flexibility of the scheduling of courses to suit a wide variety of students, including those with full-time jobs.
- The learning objectives of the courses and program that address an immediate need in industry.
- The positioning of the program as an Undergraduate microprogram making it accessible to a wide range of students, including those in industry without an undergraduate degree.
- The expertise of faculty at JMSB in providing students with the practical skills to be successful in the field.

Please do not hesitate to contact me if you have any questions.

Regards,

Stacey Tenenbaum,
Co-President,
Quebec English-language Production Council

Le jeudi 26 février 2026

Objet : ***Lettre de soutien (English version below)***

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de **Zone3**, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,



Brigitte Lemonde
Présidente et productrice exécutive
blemonde@zone3.ca

Thursday, February 26, 2026

Subject: ***Letter of support***

To: Annie Gérin, PhD
Dean, Faculty of Fine Arts
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dean Gérin,

On behalf of **Zone3**, I am writing this letter to express my support for the development of a Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University.

I see the following as key strengths of the proposed programs:

- The compact nature of the program and ability for students to complete the courses and program in a short time frame.
- The flexibility of the scheduling of courses to suit a wide variety of students, including those with full-time jobs.
- The learning objectives of the courses and program that address an immediate need in industry.
- The positioning of the program as an Undergraduate microprogram making it accessible to a wide range of students, including those in industry without an undergraduate degree.
- The expertise of faculty at JMSB and the Faculty of Fine Arts in providing students with the practical skills to be successful in the field.

Please do not hesitate to contact me if you have any questions.

Regards,



Brigitte Lemonde
President and Executive Producer
blemonde@zone3.ca

Lettre de soutien (English version below)

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de la Direction Générale du développement et de la production audiovisuelle de la SODEC, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie. Nous remarquons effectivement une grande pénurie de comptables au sein de l'industrie audiovisuelle québécoise.

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

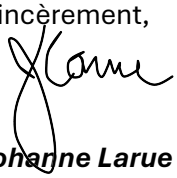
• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,



Johanne Larue
Directrice Générale de la Direction générale du développement et de la production audiovisuelle de la SODEC
SODEC
905 De Lorimier Avenue Montréal, QC H2K 3V9

Montréal, le 3 mars 2026

À: Annie Gérin, PhD
Doyenne, Faculté des Beaux-arts
Université Concordia
1515 rue Sainte- Catherine O.
Montréal, Québec, H3H 1M8

Chère madame la Doyenne,

Au nom de l'équipe de Myriad Stories, je vous écris pour vous faire part de mon appui à la création d'un microprogramme de premier cycle en comptabilité de production pour le cinéma et la télévision à l'Université Concordia.

Voici, selon moi, les principaux atouts du programme proposé :

• La concision du programme et la possibilité pour les étudiants de le terminer rapidement.

• La flexibilité de l'horaire des cours, qui conviendra à un large éventail d'étudiants, y compris ceux qui occupent un emploi à temps plein.

• Les objectifs d'apprentissage des cours et du programme, qui répondent à un besoin immédiat de l'industrie.

• Le positionnement du programme comme microprogramme de premier cycle, le rendant accessible à un large éventail d'étudiants, y compris ceux qui travaillent dans l'industrie sans diplôme universitaire.

• L'expertise du corps professoral de la Faculté des beaux-arts et de l'École de gestion John Molson (JMSB) pour transmettre aux étudiants les compétences pratiques nécessaires à leur réussite dans le domaine.

N'hésitez pas à communiquer avec moi si vous avez des questions.

Sincèrement,

Lorraine Sullivan

Hastings, March 13th 2026

From: Jim Donovan
President, Alliage 3 Entertainment Inc.
139 Park Lane,
Hastings, ON K0L1Y0

Re: ***Letter of support***

To: Annie Gérin, PhD
Dean, Faculty of Fine Arts
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dean Gérin,

On behalf of Alliage 3 Entertainment Inc. and myself, I am writing this letter to express my support for the development of a Undergraduate Microprogram in Production Accounting for Film and Television at Concordia University. I am a graduate of the Communications Studies Program (BA, 1989) and my time there was instrumental in my professional journey, as I am sure it will be for all students who will enrol in this program.

I see the following as key strengths of the proposed programs:

- The compact nature of the program and ability for students to complete the courses and program in a short time frame.
- The flexibility of the scheduling of courses to suit a wide variety of students, including those with full-time jobs.
- The learning objectives of the courses and program that address an immediate need in industry.
- The positioning of the program as an Undergraduate microprogram making it accessible to a wide range of students, including those in industry without an undergraduate degree.
- The expertise of faculty at JMSB in providing students with the practical skills to be successful in the field.

Please do not hesitate to contact me if you have any questions.

Regards,

Jim Donovan

President, Alliage 3 Entertainment Inc.

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Programs: Bachelor of Engineering in Artificial Intelligence Engineering (GCS-GCS-6045)(the "BEng in AIE") and Bachelor of Science in Artificial Intelligence (GCS-GCS-6046)(the "BSc in AI")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new undergraduate programs BEng in AIE and BSc in AI.

BACKGROUND:

BEng AIE

The proposed BEng in AIE directly addresses the growing labor market demand in Québec and across Canada. This demand is supported by data from Lightcast, Statistics Canada, and the OECD. There are over 2,300 AI-related job postings from 425 employers in Québec and more than 15,500 nationwide, with median advertised wages significantly higher than provincial averages. This trend highlights the robust opportunities available for AI-skilled professionals who possess at least a bachelor's degree.

Demand for AI expertise is particularly strong in professional, scientific, and technical services, as well as in the financial services and information and communication industries, where AI has become a key driver of productivity and innovation. The mid-2025 inflection point in AI adoption suggests that business reliance on AI will double over just one year, with roles enhanced by AI outpacing those that AI may replace. This underscores the need for engineers capable of designing, implementing, and maintaining AI systems that collaborate with human workers rather than displacing them.

There is also a notable gap in Québec's higher education system: despite being a global hub for AI with a range of minors, certificates, D.E.S.S., and master's programs, the province lacks a Canadian Engineering Accreditation Board (CEAB)-accredited BEng program specifically focused on AI. Only a few engineering programs in Canada (such as those at Ontario Tech, Western, and Algonquin) explicitly emphasize AI, and none are situated within Montreal's Mila–IVADO cluster. The BEng in AIE at Concordia will therefore introduce Québec's first integrated AI engineering pathway.

BSc in AI

The BSc in AI at Concordia University addresses the urgent need for skilled professionals in a rapidly evolving job market. AI has become a transformative technology, significantly impacting sectors like healthcare, finance, and cybersecurity. Despite Canada's reputable AI ecosystem, a notable "skills gap" persists, with AI-related job postings rising sharply, found in approximately 6% of all Canadian listings by early 2026. Québec is particularly affected, with 59% of its workforce (about 2.7 million people) in AI-exposed roles.

There is a growing preference among employers for specialists who can create trustworthy, ethical AI systems, leading to a seniority bottleneck. Currently, a significant 63% of professionals in the AI-specialist category hold credentials beyond a bachelor's degree. The proposed BSc in AI will provide the rigorous training required for undergraduates to enter this elite workforce immediately. Economically, the program offers a strong return on investment. According to the 2025 Montreal Tech Salary Guide, AI-specific roles boast high entry-level salaries, such as ML/AI Engineers earning between $85,000 and $125,000 and Data Scientists starting at $75,000. By focusing on AI, Concordia positions its graduates for lucrative careers that emphasize deep understanding of neural networks, data engineering, and intelligent systems.

Further details related to both proposed programs are included in the attached documentation. The APC recommended these programs for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the Bachelor of Engineering in Artificial Intelligence Engineering (GCS-GCS-6045) and the Bachelor of Science in Artificial Intelligence (GCS-GCS-6046), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

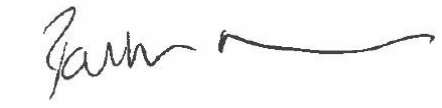
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

Summary and Rationale for Changes

The Gina Cody School of Engineering and Computer Science (GCS) proposes the establishment of a Bachelor's program in Artificial Intelligence Engineering. This program will be developed and jointly administered by three academic units— the Department of Electrical and Computer Engineering (ECE), the Concordia Institute for Information Systems Engineering (CIISE), and the Department of Computer Science and Software Engineering (CSSE)—which will collaborate under a newly formed virtual entity, the Artificial Intelligence Engineering Virtual Unit (AIE).

Program Rationale

The proposed Bachelor of Engineering in Artificial Intelligence Engineering (BEng in AIE) directly addresses the growing labor market demand in Quebec and across Canada. This demand is supported by data from Lightcast, Statistics Canada, and the OECD. There are over 2,300 AI-related job postings from 425 employers in Quebec and more than 15,500 nationwide, with median advertised wages significantly higher than provincial averages. This trend highlights the robust opportunities available for AI-skilled professionals who possess at least a bachelor's degree.

Demand for AI expertise is particularly strong in professional, scientific, and technical services, as well as in the financial services and information and communication industries, where AI has become a key driver of productivity and innovation. The mid-2025 "inflection point" in AI adoption suggests that business reliance on AI will double over just one year, with roles enhanced by AI outpacing those that AI may replace. This underscores the need for engineers capable of designing, implementing, and maintaining AI systems that collaborate with human workers rather than displacing them.

Conversely, there is a notable gap in Quebec's higher education system: despite being a global hub for AI with a range of minors, certificates, D.E.S.S., and master's programs, the province lacks a Canadian Engineering Accreditation Board (CEAB)-accredited BEng program specifically focused on AI. Only a few engineering programs in Canada (such as those at Ontario Tech, Western, and Algonquin) explicitly emphasize AI, and none are situated within Montreal's Mila–IVADO cluster.

The BEng in AI Engineering at Concordia will therefore introduce Quebec's first integrated AI engineering pathway. This program will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

Moreover, this program aligns closely with national priorities and student demand. Federal investments under the Pan-Canadian AI Strategy, CFREF, and recent AI-focused budgets emphasize that AI is a long-term economic and innovation priority rather than a fleeting trend. However, Canadian companies recognize skills shortages as a significant barrier to AI adoption, increasingly seeking engineers to lead AI integration, governance, and safety-critical deployments. Concordia's BEng in AI Engineering aims to produce graduates equipped to meet these demands: technically proficient, grounded in responsible and explainable AI, and ready to contribute to Quebec's and Canada's digital transformation across diverse sectors such as finance, health, manufacturing, public administration, and the cultural industries

What Distinguishes the Proposed BEng Program

Our curriculum is designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. Distinct in its broad and forward-looking curriculum, the program aims to equip students with both practical skills and a profound theoretical understanding. This comprehensive approach ensures that

our graduates are not just prepared for the current job market but also equipped to adapt and lead in the dynamic field, leading to sustained growth in their careers.

Target Audience

The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. It targets recent secondary school graduates and CEGEP graduates with a strong foundation in STEM, and professionals from the tech industry looking to specialize in AI. It is also ideal for career changers aiming to upskill and move into tech-centric roles.

The Concordia University Advantage

Concordia University possesses a robust and rapidly growing research capacity in artificial intelligence, supported by one of the largest academic communities in Canada dedicated to this field. A significant proportion of these researchers are engaged in applied AI, addressing real-world challenges across diverse sectors. Many are also affiliated with the Concordia Applied AI Institute, further strengthening the university's leadership and impact in applied artificial intelligence research.

Implementation and Financial Viability

Slated for launch in September 2028, the program is expected to attract a sustained and robust pool of applicants, supported by strong long-term industry growth projections. The majority of the resources required to implement the program are already in place within GCS and across the three participating departments (CIISE, CSSE, and ECE). Collectively, these units include 129 professors with recognized expertise in artificial intelligence, actively engaged in both teaching and research across multiple AI domains.

The program can be delivered without the need for additional tenure-track faculty positions or new laboratory infrastructure. Financially, it is projected to generate a surplus for the University starting in its inaugural year, thereby ensuring long-term sustainability while contributing positively to Concordia's academic standing.

The proposed program is strongly aligned with public safety priorities and prevailing industry trends, responding to the critical demand for highly qualified AI professionals capable of enhancing organizational productivity and competitiveness. Furthermore, CEAB accreditation will ensure that graduates are well prepared to meet Canada's growing needs in the professional engineering workforce.

Note: In the original proposal submitted to the Provost for support (before approval by curriculum committees), attached as a supporting document, the preliminary list of courses included AI 330 Reinforcement Learning and AI 335 Machine Learning; these course codes reflect the preliminary course lists at the time the original proposals were submitted. After further development of the program, the final course codes were as presented in the final Ministry proposal and new course forms (AI 330 Machine Learning and AI 335 Reinforcement Learning).

Resource Implications

Please see the attached budget.

New Undergraduate Program (Regular Process) - GCS-GCS-6045 - VERSION : 4

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Mar 2026

The dossier was approved by GCS Council with no modifications requested.

GCS Council document number: ECFC 2026.03.01.

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Mar 2026

Approved by:

Otmane Ait Mohamed, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 12 Mar 2026

New Program Proposal: B.Eng. in Artificial Intelligence Engineering

1. EXECUTIVE SUMMARY 2
2. PROGRAM IDENTIFICATION 5
   - 2.1 Degree awarded: 5
   - 2.2 Discipline: 5
   - 2.3 Program Title: 5
   - 2.4 Administrative location: 5
3. FIELD OF STUDY AND RELEVANCE 5
   - 3.1 Field of study 5
   - 3.2 Areas(s) of expertise 6
4. PROGRAM RATIONALE 7
   - 4.1 Socio-economic and socio-cultural opportunities 7
   - 4.2 Systemic Relevance and Opportunity 23
   - 4.3 Institutional Relevance and Opportunity 30
5. PROGRAM OBJECTIVES 32
   - 5.1 Output Profile 32
   - 5.2 General and specific program objectives 34
6. REGULATORY FRAMEWORK 34
   - 6.1 Admission Requirements and Processes 34
   - 6.2 Commitment and structure of the program 36
   - 6.3 Program oversight 36
7. PROGRAM STRUCTURE 39
   - 7.1 Activities 39
   - 7.2 Pedagogical approaches 42
   - 7.3 Typical student path 44
   - 7.4 Feedback and evaluation 46
   - 7.5 Alignment of activities, skills and program objectives 47
8. SUPPORT FOR STUDENT SUCCESS 59
   - 8.1 Financial support 59
   - 8.2 Student Services 60
   - 8.3 Academic and student life 61
9. RESOURCES 63
   - 9.1 Faculty Resources 63
   - 9.2 Administrative and support staff 71
   - 9.3 Material, technological and library resources 71

APPENDICES 75

1. EXECUTIVE SUMMARY

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Why a Cross-Departmental Program?

Artificial Intelligence is a multidisciplinary field requiring expertise in algorithms, data science, systems engineering, cybersecurity and software development. By pooling the strengths of ECE, CIISE, and CSSE, this program ensures a comprehensive and well-balanced curriculum that spans hardware, software, and systems perspectives. The cross-departmental governance model enables efficient sharing of resources, avoids duplication of efforts, and facilitates the creation of a cohesive program that leverages the unique expertise of each department. This collaborative approach strengthens GCS's ability to prepare graduates who are industry-ready and able to contribute to the rapidly evolving AI ecosystem.

Governance Structure

To ensure effective coordination, quality assurance, and alignment with the academic mission of GCS, the AIE will operate under the following governance framework:

1. **Steering Committee:** The Department Chairs of each of the three participating departments: ECE, CIISE, CSSE and the Dean or delegate.

   Responsibilities:
   - Provide strategic directions and oversee the operations of the unit
   - Oversee resource allocation and departments contributions
   - Ensure alignment with the mission and policies of GCS and Concordia University
   - Review and assess programs performance in terms of enrollment, student success, graduation, and accreditation requirements

2. **Program Director:** Rotating two-year term among the three departments, appointed by the Steering Committee.

   Responsibilities:
   - Day-to-day administration of the program
   - Liaison between students, faculty, and the Steering Committee
   - Coordination of course assignment, oversee advising, and reporting
   - Preparation of accreditation and quality assurance documentation

3. **Curriculum Committee:** Two faculty representatives from each participating department (ECE, CIISE, and CSSE), appointed by their respective Department Chairs a student representative, and a part-time faculty representative. The Program Director chairs the Committee.

   Responsibilities:
   - Academic oversight of the AI program structure and content
   - Reviewing and recommending curriculum changes, new course proposals, and program revisions
   - Ensuring coherence, academic rigor, and alignment with accreditation standards

- Monitoring course sequencing, prerequisites, and learning outcomes
- Coordinating and consulting on curriculum changes with the relevant department(s)
- Overseeing the continuous improvement process

4. **Industrial Advisory Board:** Composition: Representatives from industry and alumni.

   Role:
   - Provide guidance and advise on curriculum matters
   - Advise on AI emerging trends and strategic priorities
   - Ensure the alignment of the program with industry needs
   - Advise on opportunities for experiential learning and partnership

Expected Outcomes

Graduates of the Bachelor's program in Artificial Intelligence Engineering will acquire a strong foundation in machine learning, data analytics, intelligent systems design, and ethical considerations in AI deployment. The program will emphasize both theoretical understanding and practical application, producing engineers who are able to develop and implement AI algorithms and systems across diverse domains; integrate hardware and software solutions for real-world AI applications; address issues of safety, security, fairness, and explainability in AI systems; collaborate effectively in multidisciplinary teams and communicate technical solutions to a variety of stakeholders; and adapt to rapidly evolving technologies and contribute to innovation in the AI industry.

The program is expected to significantly enhance Concordia's reputation as a leader in engineering education by offering one of the few dedicated undergraduate AI programs in Canada. It will also contribute to the growing demand for AI talent across industries, supporting Montreal's position as a global hub for AI research and development.

Program Rationale

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2. PROGRAM IDENTIFICATION

2.1 Degree awarded:
Bachelor of Engineering (B.Eng.)

2.2 Discipline:
Artificial Intelligence Engineering

2.3 Program Title:
Bachelor of Engineering in Artificial Intelligence Engineering

2.4 Administrative location:
Institution: Concordia University
Faculty: Gina Cody School of Engineering and Computer Science
Department: Artificial Intelligence Engineering Virtual Unit (AIE)
Location: 1455 Maisonneuve Blvd. West, Montréal, Québec, H3G 1M8

3. FIELD OF STUDY AND RELEVANCE

3.1 Field of study

Artificial Intelligence (AI) is a multidisciplinary science and engineering discipline that applies principles from computer engineering, computer science, mathematics, and cognitive sciences to design intelligent systems capable of perception, reasoning, learning, and autonomous decision-making. AI systems underpin modern technologies such as machine learning, deep neural networks, computer vision, natural language processing, robotics, and intelligent cyber-physical systems. Over the past decade, AI has evolved at an unprecedented pace and has become a foundational technology driving innovation across virtually all sectors of society.

AI now plays a critical role in healthcare, transportation, manufacturing, telecommunications, finance, energy systems, and public services. Its rapid adoption has positioned AI as one of the fastest-growing global industries, with profound implications for economic competitiveness, national security, and public safety. As AI systems increasingly operate in safety-critical and mission-critical contexts, there is a growing demand for engineers who possess not only strong technical expertise but also a deep understanding of system reliability, robustness, and ethical deployment.

AI is among the fastest-growing academic and professional fields in Canadian higher education. While many Canadian universities offer AI-related courses or specializations embedded within computer science or engineering programs, only a limited number provide a comprehensive, standalone undergraduate engineering degree in AI. This gap highlights a clear and urgent need for a dedicated BEng program in Artificial Intelligence that offers depth, coherence, and strong engineering foundations.

Concordia University is well positioned to address this need, building on its recognized strengths in AI research and undergraduate education across engineering and computing disciplines. The proposed undergraduate AI engineering program expands Concordia's portfolio of core engineering disciplines and aligns closely with the University's strategic priorities in digital transformation, innovation, and societal impact. This initiative will further distinguish Concordia nationally and enhance its academic and research leadership in artificial intelligence.

The creation of the proposed program is motivated by:

- The rapid integration of AI into critical systems and the resulting need for engineers capable of designing reliable, explainable, and safe AI solutions.
- The growing responsibility of governments and industries to deploy AI systems that enhance productivity and competitiveness while managing risks related to bias, safety, security, and ethics.

- The fast-evolving nature of AI technologies, which requires continuously updated expertise and a strong engineering-based educational foundation.
- The maturity of the AI body of knowledge and the essential need to train highly qualified engineers who can design, implement, validate, and maintain AI-driven systems.

The primary academic objective of the program is to prepare students for professional careers in artificial intelligence through rigorous training in foundational theories, algorithms, and state-of-the-art technologies. Graduates will be equipped to design and deploy AI solutions across key sectors such as healthcare, transportation, manufacturing, telecommunications, and public services. In addition, the program emphasizes analytical thinking and research skills, enabling students to engage in applied research and critically assess the impact of AI systems in real-world contexts.

3.2 Areas(s) of expertise

To meet the requirements of the Canadian Engineering Accreditation Board (CEAB), the proposed BEng program is a rigorous 120-credit degree grounded in a strong engineering foundation. Unlike programs that offer AI as a specialization within another discipline, this BEng program provides more than 90 credits dedicated specifically to artificial intelligence and its engineering foundations, ensuring both depth and coherence.

The curriculum is designed to integrate theoretical foundations with practical applications, preparing graduates to address the technical, operational, and societal challenges associated with AI systems. A range of pedagogical approaches—including laboratory-based instruction, project-based learning, blended delivery, and work-integrated learning—will be employed to enhance student engagement and professional readiness. These approaches support the program's dual emphasis on core AI principles and contemporary industry practices.

Comprehensive and Multidisciplinary Curriculum

The proposed BEng program offers a comprehensive and multidisciplinary curriculum that integrates core computer and electrical engineering concepts with advanced AI knowledge. Students will develop strong foundations in mathematics, probability, optimization, algorithms, and data structures, alongside specialized training in machine learning, deep learning, computer vision, natural language processing, and reinforcement learning. The curriculum is further enriched by electives in emerging areas such as trustworthy and explainable AI, AI for cyber-physical systems, autonomous systems, and AI for smart infrastructures. This broad-spectrum approach equips graduates with the skills required to engineer robust, scalable, and responsible AI solutions.

Work-Integrated Learning Across the Curriculum

A defining feature of the program is the integration of AI-related content throughout the entire curriculum, rather than limiting it to upper-year specialization. This structure enables students to progressively build expertise and participate in multiple AI-focused co-op internships. The program is supported by Concordia's Institute for Cooperative Education and leverages strong research and industry connections across engineering and computing. Students will gain meaningful professional experience in industrial and applied research environments under joint supervision by industry mentors and faculty members, significantly enhancing employability.

Industry and Government Collaboration

The curriculum will be strengthened through strategic collaborations with industry leaders and government agencies, as evidenced by strong interest expressed in stakeholder consultations. Course projects and applied research initiatives will be supported by partners in sectors such as aerospace, manufacturing, telecommunications, healthcare, and public services. In addition, advisory input from industry and government stakeholders will provide continuous feedback, ensuring that the program remains aligned with evolving workforce needs, regulatory frameworks, and technological advancements.

Concordia University's strong academic and research foundations in artificial intelligence offer a compelling value proposition for both domestic and international students.

4. PROGRAM RATIONALE

4.1 Socio-economic and socio-cultural opportunities

4.1.1. Economic, social, and cultural needs

The growing deployment of AI in Canada's public sector underscores both the economic and social importance of developing AI expertise. Statistics Canada, for instance, is integrating AI and machine learning across its operations, from agricultural yield prediction and greenhouse mapping using satellite imagery to automated classification in the Canadian Coroner and Medical Examiner Database and an AI-enabled chatbot for the 2026 Census. These initiatives aim to improve efficiency, reduce response burden on farmers, and detect emerging public health threats, while operating under stringent requirements for privacy, confidentiality, and ethical use of data. Such applications highlight the urgent need for engineers who can design, implement, and govern AI systems that are technically robust and socially responsible, particularly in domains where public trust and data protection are critical.[1]

Recent national data also confirm the rapid and broadening adoption of AI across Canadian industry. According to Statistics Canada's Canadian Survey on Business Conditions, the share of businesses using AI to produce goods or deliver services doubled from 6.1% to 12.2% between the second quarters of 2024 and 2025, and 14.5% now plan to adopt AI in the next 12 months, up from 10.6% a year earlier. Adoption is especially strong in information and cultural industries (35.6% current use; 38.6% planning to adopt), finance and insurance (30.6% use; 31.5% planning), and professional, scientific and technical services (31.7% use; 26.3% planning), with notable growth in health care and social assistance (expected use rising from 11.4% to 23.2% in one year). These are precisely the sectors that shape Canada's cultural landscape, financial stability, and public well-being, and they increasingly require engineers who can design, implement, and govern AI systems. A dedicated BEng in Artificial Intelligence will prepare graduates to meet these sector-specific demands, supporting responsible AI integration in industries that are central to Canada's economic competitiveness and social infrastructure.[2]

The Canadian Survey on Business Conditions also indicates that AI adoption will be widespread across firms of all sizes. While 14.5% of all businesses plan to use AI over the next 12 months, this rises to 20.5% among firms with 100 or more employees, with broadly similar application profiles across large and small enterprises (data analytics, text analytics, and virtual agents or chatbots). Among businesses planning to adopt AI, the most common operational response is to train existing employees: about half (49.8%) report plans to provide AI training to staff, alongside developing new workflows, investing in cloud services, and changing data-management practices. Although hiring new AI-trained staff is still relatively uncommon (12.6%), suggesting that many firms currently attempt to meet AI-related skills needs through internal upskilling rather than recruitment, a BEng in Artificial Intelligence will expand the pool of graduates with advanced technical and applied competencies, enabling Canadian employers to complement internal training strategies with the recruitment of engineers who can lead AI integration, systems design, and governance.

The importance of AI to Canada's economic and innovation agenda is reflected in major federal investments under the Pan-Canadian Artificial Intelligence Strategy and related research programs. Phase I of the Strategy (2017–2022) invested $125 million, led by CIFAR in partnership with the national AI institutes Amii (Edmonton), Mila (Montréal) and the Vector Institute (Toronto and Waterloo), to build Canada's AI research and talent base through initiatives such as the Canada CIFAR AI Chairs program. Phase II (2021–2031) adds $443.8 million to drive AI adoption and use, including support for commercialization in key industries, AI-related standards through the Standards Council of Canada, and advanced computing capacity via the Digital Research Alliance of Canada. Complementing this, the Canada First Research Excellence Fund (CFREF) enables postsecondary institutions to build globally leading research programs in areas that create durable economic advantages for Canada, such as IVADO's "robust, reasoned and responsible AI (R3AI)" project, while the federal granting agencies (CIHR, NSERC and SSHRC) collectively invested nearly $200 million in

[1] Statistics Canada, "Artificial intelligence at Statistics Canada," 2025, https://www.statcan.gc.ca/en/trust/collecting-your-data/artificial-intelligence

[2] Statistics Canada, *Artificial intelligence use by businesses in Canada, second quarter 2025,* Canadian Survey on Business Conditions, 2025, https://www150.statcan.gc.ca/n1/pub/11-621-m/11-621-m2025011-eng.htm

2021–22 alone in AI-related research and training. Recent budgets further commit over $2 billion to AI compute infrastructure, targeted funding to boost AI start-ups and help SMEs deploy AI, supports for workers impacted by AI, and the creation of a Canadian AI Safety Institute, alongside emerging initiatives such as the Canadian Sovereign AI Compute Strategy. Together, these sustained investments demonstrate that AI is a long-term national priority. A dedicated BEng in Artificial Intelligence will directly support these efforts by supplying highly qualified engineers who can leverage Canada's AI research infrastructure, advance commercialization and responsible adoption across sectors, and translate cutting-edge AI research into practical, standards-aligned solutions for the Canadian economy and society.[3]

Beyond aggregate adoption and investment trends, early evidence on employment impacts highlights important social considerations. A recent Statistics Canada analysis of Canadian employment trends in the era of generative AI finds no clear evidence, three years after the mass availability of tools such as ChatGPT, of widespread AI-induced job loss or disproportionate declines in occupations more exposed to AI compared with others; overall employment has continued to grow, and the pace of occupational change is comparable to previous waves of technological adoption (e.g., computers, the Internet). At the same time, the study identifies distributional effects—such as weaker job growth for younger and less-educated workers—and emphasizes substantial uncertainty as AI diffusion is still in its early stages and interacts with other shocks (pandemic recovery, immigration, trade). These findings underscore a social need for education programs that both expand access to high-quality AI-related jobs and prepare engineers to design and govern AI systems with attention to fairness, inclusion, and long-term labour-market impacts. A BEng in Artificial Intelligence responds directly to this need by integrating technical depth with training in ethics, regulation, and the social implications of AI.[4]

4.1.2. Evolution of the fields in Quebec

The field of Artificial Intelligence (AI) in Quebec has developed rapidly over the past decade, positioning the province—and especially Montréal—as a globally recognized AI hub. Building on the national policy and investment framework outlined in Section 4.1.1, Quebec has leveraged its strong research base, favourable innovation policies, and dynamic technology ecosystem to anchor AI at the centre of its economic and digital strategy. This evolution is reflected in targeted government initiatives, world-class academic and research institutions—particularly Mila, the Quebec AI Institute—and a dense network of firms and clusters that are accelerating AI adoption across key sectors of the provincial economy.

Government initiatives and policies

Quebec's government has made AI a cornerstone of its broader innovation and digital-transformation agenda. Successive research and innovation strategies, notably the 2017–2022 Québec Research and Innovation Strategy[5] and the 2022–2027 Québec Research and Innovation Investment Strategy (SQRI²)[6], explicitly identify AI, data science, and advanced digital technologies as priority domains for investment, talent attraction, and economic diversification. SQRI² alone provides more than $7.5 billion over five years across five axes—excelling in research; creating an innovation-friendly environment; supporting business investment and commercialization; developing talent and an innovation culture; and focusing on promising sectors and catalyst projects—in which AI and digital technologies play a central, cross-cutting role.

To translate this vision into practice, the province relies on a dense network of intermediaries and funding programs. Through organizations such as Investissement Québec and the ministère de l'Économie, de l'Innovation et de

[3] Innovation, Science and Economic Development Canada, Artificial intelligence ecosystem in Canada, Government of Canada, 2026, https://ised-isde.canada.ca/site/ised/en/artificial-intelligence-ecosystem

[4] Statistics Canada, "Canadian employment trends in the era of generative artificial intelligence: Early evidence," Economic and Social Reports, 2026, https://www150.statcan.gc.ca/n1/pub/36-28-0001/2026001/article/00003-eng.htm

[5] Gouvernement du Québec. (2017). Québec research and innovation strategy 2017–2022. https://msss.gouv.qc.ca/professionnels/documents/bureau-innovation-sante-et-services-sociaux/strategie-quebecoise-sciences-vie_2017-2027.pdf

[6] Gouvernement du Québec. (n.d.). 2022–2027 Québec strategy to support research and investment in innovation. https://www.quebec.ca/en/gouvernement/ministeres-organismes/economie/publications/2022-2027-quebec-strategy-to-support-research-and-investment-in-innovation

l'Énergie (MEIE), Quebec co-finances AI institutes and industrial projects, supports AI-intensive SMEs and start-ups, and helps attract major international AI labs. Sector-based industrial research clusters (Regroupements sectoriels de recherche industrielle, RSRIs)—including Prompt for information, communications and digital technologies—act as designated intermediaries for collaborative AI and ICT R&D, linking firms and academic partners and de-risking projects from lab to market. Programs such as NovaScience (scientific culture and innovation), MEIE's Collaborative Industrial Research and Support to Innovative Entrepreneurship, and dedicated PROMPT–AI funding streams provide grants for AI research, pilots, and commercialization, particularly in manufacturing, information and cultural industries, and professional, scientific and technical services.

Quebec has also adopted a dedicated Strategy for Integrating Artificial Intelligence into Public Administration (2021)[7], recognizing both the efficiency gains and the ethical, legal, and governance challenges of AI in public services. The Directorate for Ethical Oversight of Artificial Intelligence (DEEIA) oversees this strategy and ensures that AI integration in public bodies is grounded in responsible practices. Its mandate includes developing guidelines and rules for ethical AI use, preparing roadmaps for responsible AI deployment by state mission, evaluating and monitoring AI adoption in public bodies, and developing and enforcing risk-management and compliance frameworks.

Quebec's AI trajectory is further reinforced by its alignment with federal initiatives. Since 2017, Mila – Quebec Artificial Intelligence Institute, together with its sister institutes Amii (Alberta) and Vector (Ontario), has been a pillar of the Pan-Canadian AI Strategy led by CIFAR. In parallel, SCALE AI, Canada's AI Global Innovation Cluster focused on AI-enabled value chains, is headquartered in Montreal as one of five national Global Innovation Clusters. As a business-led consortium, SCALE AI co-invests with government to integrate AI into value chains in sectors such as consumer goods, manufacturing, logistics, infrastructure, and intra-hospital logistics, while also funding upskilling and academic training initiatives. These provincial and federal mechanisms jointly create a highly supportive policy environment for AI research, deployment, and talent development in Quebec.

Education and research

Quebec's rise as an AI leader is rooted in a dense academic ecosystem that spans computer science, engineering, mathematics, and the social sciences.

At its core is **Mila – Quebec Artificial Intelligence Institute**, founded in 1993 by Professor Yoshua Bengio at Université de Montréal. Originally created as a research lab to build a community of high-calibre AI researchers sharing a common ethical vision, Mila has since become the world's largest academic research centre for deep learning. The institute is recognized internationally for major contributions in language modelling, machine translation, object recognition, and generative models, and today hosts the world's largest concentration of deep learning academic researchers.

Mila is the result of a unique collaboration between Université de Montréal and McGill University, working closely with Polytechnique Montréal and HEC Montréal, and also hosting professors from Université Laval, Université de Sherbrooke, École de technologie supérieure, and Concordia University. In total, it brings together more than 1,400 individuals, including professors, student researchers, interns, and professional staff. Mila's research is explicitly oriented toward societal impact, with core focus areas in health, environment and climate change, and AI ethics, and is conducted using an open-science approach that promotes collaboration and knowledge transfer. In 2022–2023 alone, nearly 120 industry partners—including close to 40 start-ups—were engaged with the institute, more than 30 start-ups held official "Mila Startup" status, over 600 research projects involved Mila-affiliated faculty members, close to 300 scientific publications were produced, and 905 students, interns, and research assistants received training at Mila. Since becoming a non-profit organization in 2018 and inaugurating its Mile-Ex premises in 2019, Mila has anchored a vibrant AI innovation district in Montreal.[8]

[7] Gouvernement du Québec. (n.d.). Support and guidance for public bodies in artificial intelligence. https://www.quebec.ca/gouvernement/services-organisations-publiques/services-transformation-numerique/accompagnement-des-organismes-publics/accompagner-les-organismes-publics-en-intelligence-artificielle

[8] Mila – Quebec Artificial Intelligence Institute. (n.d.). About Mila. https://mila.quebec/en/about/about-mila

Complementing Mila, **IVADO (Institut de valorisation des données)** serves as an interdisciplinary and intersectoral research, training, and knowledge-mobilization consortium whose mission is to build and promote robust, reasoning, and responsible artificial intelligence. Led by Université de Montréal with four core university partners—Polytechnique Montréal, HEC Montréal, Université Laval, and McGill University—IVADO brings together research centres, government, and industry partners to co-create intersectoral initiatives that foster a paradigm shift in AI and its adoption. Guided by values of excellence, collaboration, and responsible, accessible impact, IVADO's vision is to accelerate Quebec's digital transformation by catalyzing research progress around big-data exploitation. Since 2016, IVADO has invested about $42 million in AI research through scholarships and grants, including $6 million dedicated to five major scientific challenges, and awarded roughly 570 scholarships. Its R3AI (robust, reasoning, and responsible AI) program, funded through the Canada First Research Excellence Fund, supports a set of Strategic Research Clusters—ten intersectoral clusters that coordinate scientific programming to realize the R3AI vision. IVADO's community comprises nearly 1,500 scientists across AI, life sciences, natural sciences, and social sciences, as well as 14 academic members and more than twenty partners, positioning Quebec as a leader in trustworthy, societally oriented AI.[9]

Concordia University, through the Gina Cody School of Engineering and Computer Science and its Applied AI Institute, plays a complementary and increasingly significant role in advancing AI in Quebec. Concordia's AI activities emphasize applied and interdisciplinary research in areas such as intelligent and cyber-physical systems, smart cities, human-centred and trustworthy AI, cybersecurity, and AI-enabled software and infrastructure. The university participates in Mila's extended network and in provincial and federal AI initiatives, and hosts AI-related research chairs and large-scale projects that link AI to critical infrastructure, transportation, and security. Concordia's programs and labs are tightly connected to industry partners and government agencies, making it a key contributor to deployable, real-world AI solutions.[10]

On the applied industrial side, **SCALE AI**—headquartered in Montreal—acts as Canada's AI Global Innovation Cluster focused on AI-powered value chains. It co-funds collaborative projects between companies and research institutions, including Quebec universities, to integrate AI into supply chains in consumer goods, manufacturing, logistics, infrastructure, and intra-hospital logistics. SCALE AI also invests heavily in talent development through professional upskilling and academic training, with a particular emphasis on addressing digital-literacy gaps, filling tens of thousands of skilled supply-chain positions, and increasing participation of underrepresented groups in AI.[11]

Quebec universities more broadly—Université de Montréal, Polytechnique Montréal, McGill University, Concordia University, ÉTS, Université Laval, Université de Sherbrooke, and HEC Montréal—have expanded AI-related educational offerings at all levels, from undergraduate options and professional master's to research-intensive graduate programs and micro-credentials. Many of these programs are directly connected to Mila, IVADO, SCALE AI, and institutional AI centres, giving students access to cutting-edge research and applied projects.

In parallel, Quebec has developed significant expertise in the societal, legal, and ethical dimensions of AI. **The International Observatory on the Societal Impacts of AI and Digital Technology (Obvia)**, created in 2019 by the Fonds de recherche du Québec and led by Université Laval, conducts independent, interdisciplinary research that places humans at the heart of technological development. Bringing together 23 post-secondary institutions, more than 290 researcher members, over 100 partners, and seven research areas, Obvia has invested roughly $7 million in research, funded 56 research teams, and supported more than 50 students through scholarships. It provides an open space for reflection and democratic deliberation, helping to maximize positive impacts and minimize negative effects of AI and digital technologies on society. Alongside legal and policy scholars at Université de Montréal, McGill, Université Laval, Concordia, and other institutions, Obvia reinforces Quebec's leadership in responsible, human-centred AI.[12]

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[9] IVADO. (n.d.). Institut de valorisation des données. https://ivado.ca/en/

[10] Concordia University. (n.d.). Applied AI Institute. https://www.concordia.ca/research/applied-ai-institute.html

[11] SCALE AI. (n.d.). HEC Montréal – École des dirigeants. https://www.scaleai.ca/organisation/hec-montreal-ecole-des-dirigeants/#:~:text=What%20is%20a%20Global%20Innovation,focused%20solely%20on%20AI%20projects.

[12] International Observatory on the Societal Impacts of Artificial Intelligence and Digital Technology. (n.d.). About. https://www.obvia.ca/a-propos

Industry growth and demand

Quebec's AI industry has expanded rapidly, leveraging the province's research strengths, favourable business climate, and international reputation. Montreal is frequently cited as one of the top global AI hubs, with a high concentration of AI researchers, graduate students, and start-ups relative to its size. The presence of Mila and IVADO, the applied-research orientation of institutions such as Concordia, and the industrial deployment focus of SCALE AI have been powerful attractors for domestic and foreign investment, as well as for highly qualified talent.

The province now hosts hundreds of companies whose core activities rely on machine learning and data-driven products, alongside a much larger number of firms progressively integrating AI into existing operations. These companies span finance and insurance, video games and interactive media, language technologies, health and med-tech, manufacturing and robotics, logistics and transportation, and creative industries. Major international technology firms such as Google, Meta, Microsoft, Samsung, Thales, and Ubisoft have established research or engineering teams in Montreal, often in collaboration with local universities and institutes. At the same time, numerous Quebec-based start-ups and SMEs emerge from the ecosystems of Mila, IVADO, SCALE AI, and university incubators such as Centech and District 3, contributing to a dynamic entrepreneurial environment in which AI-driven innovation is central to business models.

Labour-market evidence consistently points to sustained and diversified demand for AI skills across Quebec. Economic-development agencies and sectoral observatories highlight shortages of qualified professionals in roles such as machine-learning engineer, data scientist, MLOps engineer, AI software developer, and AI product engineer. This demand extends beyond "pure tech" firms to traditional industries—finance (e.g., Desjardins, National Bank), insurance, transportation and logistics, energy, and health care—that are increasingly deploying AI for applications such as risk scoring, fraud detection, predictive maintenance, demand forecasting, and clinical decision support. As organizations move from proofs of concept to production-grade, mission-critical AI systems, they require professionals who combine advanced AI knowledge with robust engineering practices: software architecture, real-time and distributed systems, cybersecurity, validation and verification, risk management, and human-in-the-loop design.

Existing AI training pathways in Quebec are strong but fragmented: computer-science and data-science programs provide solid foundations in algorithms and modelling; specialized graduate programs and research labs produce high-end researchers; and professional programs support upskilling for working professionals. However, there is still a limited supply of graduates who are simultaneously trained as engineers and as AI specialists, able to design, implement, and govern end-to-end AI systems that must meet safety, reliability, regulatory, and ethical requirements in demanding application domains.

4.1.3. Justification of the proposed program

In this context, a dedicated **Bachelor of Engineering in Artificial Intelligence Engineering** responds directly to Quebec's evolving needs and strategic priorities:

1. **Alignment with Government Strategies:** The program responds to Quebec's focus on responsible AI deployment in public services, training engineers who understand legal and ethical frameworks.
2. **Research Ecosystem Integration:** The BEng in AIE bridges foundational research and practical engineering, preparing students to implement advanced AI techniques across various sectors.
3. **Addressing Talent Gaps:** The program will focus on the entire AI lifecycle, equipping graduates with skills in data handling, model development, deployment, and compliance.
4. **Supporting Industrial Transformation:** By aligning with funding programs and clusters, the BEng will produce engineers capable of delivering maintainable AI solutions in diverse industries.
5. **Promoting Responsible AI:** The curriculum will integrate ethics and societal impacts alongside technical training, preparing engineers to mitigate risks associated with AI technologies.
6. **Strengthening Global Positioning:** A distinctive BEng in AIE will enhance Quebec's reputation as a leading AI hub, attracting talent and supporting local innovation.

Overall, the program aims to produce a new generation of engineers specialized in AI systems, essential for maintaining Quebec's leadership in AI and fostering sustainable development.

4.1.4. Student Interest Surveys

4.1.4.1 Concordia University Student Survey

Overview and Methodology

- Survey Purpose: Gather feedback from students in engineering and computer science programs enrolled at the Gina Cody School of Engineering and Computer Science at Concordia University and assess the viability of three proposed programs:
    - Bachelor of Engineering (BEng) in Artificial Intelligence Engineering
    - Bachelor of Science (BSc) in Artificial Intelligence
    - Minor in AI
- Surveyed population: 2500 students
- Responses received: 1236
- Response rate: ~50%
- Sample Selection: The analysis below focuses on N=956 students (77% of respondents) who explicitly indicated interest in AI topics; 184 respondents indicated low interest and were screened out.

Respondent Profile

The student sample reflects a broad cross-section of undergraduate programs within the Gina Cody School of Engineering and Computer Science. Among respondents, approximately 81% are enrolled in Bachelor of Engineering programs (including Aerospace, Building, Chemical, Civil, Computer, Electrical, Industrial, Mechanical, and Software Engineering), while about 19% are in Computer Science or closely related joint majors (e.g., Computer Science with Data Science, Computation Arts, or Health and Life Sciences). This indicates that the survey primarily captures the perspectives of engineering students, with a substantial but smaller representation from computer science and CS-based joint programs.

The cohort is well distributed across years of study: 29% are first-year students, 26% are second-year students, 23% are third-year students, and 21% are fourth-year or above. About 1% identify as “other,” including ECP, prerequisites, and part-time or mature students. This distribution shows that interest in AI-related initiatives spans all disciplines and stages of undergraduate study, offering a balanced basis for evaluating potential uptake of new AI-focused programs.

Key Findings

1. **Program Viability**
    - Minor in AI (Highest Demand): The Minor in AI emerges as the most attractive option for students. Approximately 78% of AI-interested respondents indicated they would be likely to enroll. When asked to select a single preferred path, the Minor received 439 votes, ahead of the full BEng (127) and BSc (41), reflecting a clear preference for adding AI expertise on top of existing foundational degrees.
    - BEng in AI Engineering (Strong Core Interest): The proposed BEng shows solid potential uptake: 57% of AI-interested students would be likely to apply if it were available today, and about half indicate they would have chosen it over their current program. This points to a viable market for a rigorous, systems-focused engineering pathway, with the potential to attract students who might otherwise pursue similar programs outside Quebec.
    - BSc in AI (Targeted Niche Opportunity): The BSc in AI appeals to a more specialized subset of students. Among AI-interested respondents, ~37% report they would be likely to enroll, while a significant share indicate they would prefer to gain AI skills through a Minor or engineering degree. When the analysis is restricted to students currently enrolled in BCompSc programs (N = 214), interest in the BSc in AI increases markedly: 58% of these students report that they would be likely to enroll. This contrast suggests that the BSc in AI is particularly attractive to students already oriented toward computer science and related fields, whereas engineering students tend to prefer AI as a complementary specialization—either through a Minor or a dedicated BEng in AI Engineering—within their existing discipline. These results suggest that a BSc in AI would serve a focused population seeking a science-oriented AI pathway, and that it would be most effective as part of a broader portfolio anchored by a high-enrollment Minor and a strong BEng.

Together, these findings suggest a tiered opportunity: a widely appealing Minor in AI, a high-potential BEng in AI Engineering, and a more targeted BSc in AI for computer science-focused students.

2. Reasons for Considering an AI-Focused Program

In response to Q19, which asked, "What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?" a total of 461 open-ended answers were collected. These responses were analyzed thematically, revealing that while students articulated their motivations in diverse ways, their answers consistently clustered into several clear, recurring themes.

- ***Career Competitiveness, Job Security, and Labour-Market Alignment***
  A key theme is the belief that AI skills are essential for competitiveness in today's and tomorrow's job market. Many students link an AI-focused credential to better employability, higher-quality job opportunities, and protection against automation. Students view AI as “the main attraction point” for the next decade, highlighting its growing integration into daily life. Many believe that those familiar with AI will be less likely to be replaced by it, seeing AI expertise as a safeguard against job displacement. Additionally, AI training is viewed as a way to enhance career prospects and maintain competitiveness in the evolving technology field. Overall, AI is increasingly seen as a labor market necessity, supported by strong demand for related skills

- ***AI as a Foundational, “Future-Oriented” Technology***
  A related theme is the perception of AI as an inevitable technology shaping the future of engineering, computing, and society. Students often refer to AI as “the future,” noting that “we’re heading into an AI-focused future.” They assert that AI “plays a significant role in engineering today” and that having skills in AI management is crucial. This suggests students view AI as a general-purpose technology essential for various professional fields.

- ***Intellectual Interest and Desire for Depth/Specialization***
  Many students express a strong interest in AI, viewing it as a complex and intellectually stimulating field that requires specialized knowledge. They seek a structured pathway that reduces entry barriers and facilitates access to advanced AI topics, emphasizing the need for a solid software foundation, diverse topic coverage, research opportunities, and real-world industry experience. These insights suggest that an AI-focused program is attractive not only as a credential but also as a source of rigorous training in a technically challenging and conceptually rich area.

- ***Real-World Application and Responsible Use***
  Many responses emphasize the importance of applying AI to practical, real-world challenges in a safe and structured manner. Students are eager to use AI to tackle "real-world problems" and express interest in learning to "apply existing AI technologies" effectively and safely. Some respondents highlight that "AI should be utilized in all domains," and understanding its workings is "essential for addressing modern challenges." These insights align with survey findings that show students value both technical skills and knowledge of trusted, responsible AI.

- ***Complementing Existing Degrees and Targeted Career Paths***
  Many students perceive an AI-focused program—particularly a Minor—as a complement to their primary degree, rather than a replacement for it. Some students explicitly mention that they “wouldn’t consider an AI-focused program” as a full degree; instead, they see it “more as a supplement” to their existing interests in fields like computer science or engineering. Others associate AI training with specific career paths, such as robotics and embedded systems, or with “adding coding to machinery building” through a minor. This aligns with quantitative findings that indicate an AI Minor has broad appeal, as it enables students to enhance their core degrees (such as in computer science, software engineering, or electrical engineering) with specialized AI skills.

- ***Baseline AI Literacy as a Requirement for Modern Engineers***
  Many believe that AI literacy should be a standard part of engineering and computing education. One respondent highlights that it's "crucial for every computer or software engineering student to take at least one AI course" to stay current in a rapidly changing world. Students consider AI awareness and basic proficiency essential for being a "modern" engineer or computer scientist, not just optional extras.

This supports the argument for incorporating AI content in specialized degrees, as well as minors and core curricula.

3. Enhancing AI Program Appeal: Student Insights

Students provided a variety of insights on how to enhance the attractiveness of AI programs. The most frequently selected features included:

- Industry Connections: A significant majority (592 selections) indicated that opportunities to work with industry and research labs would greatly enhance the program's appeal.
- Hands-On Learning: Students favor more hands-on, project-based learning experiences (557 selections), indicating a desire for practical application of skills.
- Clear Outcomes: Many respondents (527 selections) highlighted the importance of a well-defined program structure that articulates potential career paths.
- Flexible Electives: Students expressed a strong interest (487 selections) in having flexible electives that allow the integration of AI with other fields.
- Co-op Options: While a co-op option (467 selections) was favored, mandatory co-op placements received significantly less support (195 selections), suggesting a preference for optional work-integrated learning.
- Additional Comments: A number of respondents (56 selections) provided insights through "Other" responses, emphasizing themes such as the importance of ethics in AI, the need for relevant project work from the beginning, and clarity in how AI degrees differentiate from existing computing and engineering programs.

Overall, the findings suggest that students value programs that are experiential, industry-connected, and clearly articulated in terms of career paths. Additionally, there is a call for a strong ethical dimension within the curriculum, alongside the flexibility to combine AI studies with other academic interests.

4. Student Sentiment and Considerations for Program Design

While ~80% of respondents view AI programs as highly relevant to their career goals, their qualitative feedback on the BSc in AI (in contrast to the BEng in AI Engineering) points to important design considerations that can strengthen the proposed BSc in AI:

- Perception of long-term value: Some students want reassurance that an "AI degree" will represent a durable, foundational credential rather than a short-lived response to current trends. They emphasize the importance of strong core training in computer science and engineering fundamentals, with AI built on top of that base, to avoid over specialization.
- Integration with existing disciplines: Many respondents see AI as closely connected to Software Engineering and Computer Science and therefore favour models where AI is clearly integrated with these disciplines-through shared foundations, electives, and cross listed courses-rather than perceived as an isolated silo. This feedback supports designing the BSc in AI with robust CS/SE fundamentals and clear pathways to combine AI expertise with broader computing skills.

5. Curriculum Requirements: “Hard” Skills & Ethics

To be successful, the program must distinguish itself through rigour and infrastructure:

- Top Priorities: Machine Learning/Deep Learning, Robotics/Embedded Systems, and Data Analytics.
- Infrastructure: Access to GPUs, cloud resources, and real-world datasets is a non-negotiable expectation (rated "Extremely Important" by nearly 40%).
- Ethics: There is strong demand for coursework covering trusted AI, safety, and societal impact, contradicting the assumption that engineering students only prioritize technical skills.

See Appendix 3 for detailed survey results.

4.1.4.2 CEGEP Student Survey on Proposed AI Programs

Overview

Concordia University's Gina Cody School of Engineering and Computer Science conducted a survey targeting CEGEP students who attended their February 2026 Open House and expressed interest in engineering and computer science programs. The survey aimed to assess student interest in two proposed AI programs:

- B.Eng. in Artificial Intelligence Engineering
- B.Sc. in Artificial Intelligence

The responses indicate very high general interest in AI, moderate stated interest in applying to a specific AI program, and a strong emphasis on career outcomes, co-op, and academic quality as decision drivers.

Student Profile

- 7 from Quebec CEGEPs (3 French, 4 English)
- 2 from Canadian high schools (one standard, one international diploma)
- 1 from an international high school
- 1 already in the final year of a bachelor's degree

This reflects a mix of traditional CEGEP pathways and more diverse/advanced academic backgrounds.

Prior research on AI programs

About half have already explored AI study options despite being at the pre-university/early-university level.

Current interest in AI

All respondents report high interest (4 or 5), suggesting strong intrinsic motivation toward AI as a field.

Interest in Applying to an AI Program:

- Among those who answered, 3/5 show high interest in applying (4 or 5), while 2/5 show low interest (1 or 2).
- The non-response from more than half the participants (6/11) suggests uncertainty, need for more information, or survey fatigue; actual application interest is therefore unclear and likely under-defined rather than low.

Preferred Type of AI Program

- Among those who responded, interest is split evenly between an engineering-focused and a computer science–focused AI pathway.
- No stated interest in a business-oriented AI program in this small sample.
- The "not sure" response and low total response count suggest many students still lack clarity on the distinctions between program types and would benefit from clearer positioning and communication.

Key Factors Influencing Choice of an AI Program

- Career outcomes and work-integrated learning (co-op) are the dominant priorities.
- Academic substance and quality (course offerings, faculty expertise) are also highly important, reinforcing the need to highlight curriculum depth and research/industry engagement in marketing materials.
- Traditional prestige signals (program reputation) and financial support matter to a subset but are less decisive than career-related benefits in this group.
- Physical location appears to be of minimal concern for these respondents.

Brief Overall Analysis and Implications

- There is very strong general interest in AI across this small, self-selected sample, suggesting good potential demand.
- Actual willingness to apply, based on the limited answers, is promising but not yet clearly defined; many

students may be in an exploratory phase and require more program details before expressing firm intent.
- Interest is balanced between an engineering-oriented and a computer science–oriented AI program, supporting the idea that both a B.Eng. in AI Engineering and a B.Sc. in AI could appeal to distinct but overlapping audiences.

Given the small sample size (n = 11) and partial response rates, these findings are indicative rather than definitive. However, they show strong enthusiasm for AI, especially regarding employability and practical experience. GCS will consider these findings to emphasize:

- Concrete career paths and industry relevance
- Strong co-op opportunities and hands-on experience
- Clear, differentiated descriptions of the B.Eng. vs. B.Sc. pathways
- Visible faculty strength and well-structured, modern AI course offerings

See Appendix 3 for detailed survey results.

4.1.5. Industry Survey

Overview and Methodology

- Survey Purpose: Gather feedback from industry experts on two proposed programs:
  - Bachelor of Engineering (BEng) in Artificial Intelligence Engineering
  - Bachelor of Science (BSc) in Artificial Intelligence
- Surveyed population: 50 industry experts
- Responses received: 20
- Response rate: 40%

The survey addressed respondent profiles, current and future AI workforce needs, perspectives on BEng and BSc differentiation, desired competencies and curriculum, experiential learning, and collaboration interests.

Respondent Profile

The 20 respondents are primarily senior leaders and technical decision-makers from diverse organizations. Job titles include Presidents, CEOs, Vice Presidents, directors, and senior technical leaders. Most focus on executive or senior management (16), with notable involvement in research and R&D (7) and engineering and development (6). Fewer are engaged in operations, product management, people management, and data/AI/analytics. This indicates that the feedback reflects strategic and technical expertise.

Respondents represent organizations across sectors relevant to AI, including software, engineering consulting, healthcare technology, finance, aerospace, logistics, robotics, construction, IT services, and R&D. Company sizes range from very small (1–9 employees; 5 respondents) and small-to-medium (10–99; 8 respondents) to mid-size (100–999; 3 respondents) and large or global enterprises (1,000–9,999; 1 respondent, 10,000+; 3 respondents). This diversity ensures the survey reflects perspectives from both innovative SMEs and established organizations, providing a strong foundation for designing AI-focused BEng and BSc programs.

AI Workforce Demand and Talent Gaps

Respondents anticipate strong growth in AI-related employment. All 20 experts expect demand to rise over the next five years, with 18 predicting significant growth and 2 expecting moderate growth. Existing and emerging job titles include ML Engineers, Data Scientists, AI/ML Specialists, AI Engineers, Industrial AI Engineers, MLOps Engineers, Applied ML Scientists, AI Research Scientists, AI Transformation Leads, and Chief AI Officers. Several respondents also note the increasing importance of hybrid roles that combine AI with hardware (such as NPUs and embedded systems) and domain sciences (such as biochemistry and physiology).

Despite expected growth, organizations report significant upskilling needs and uneven hiring conditions. All 20 respondents see a moderate or higher need for AI-related training, with 12 indicating a high or critical need. Eight organizations report difficulty recruiting AI talent, four do not, and eight are unsure, often due to early-stage or indirect AI hiring. The hardest-to-fill roles require strong dual expertise (such as AI with hardware or life sciences), deep

mathematical and theoretical knowledge to design new models, and high coding fluency in languages like Python, Java, or C#. Many current graduates lack the theoretical depth, problem-solving skills, and programming proficiency needed for advanced AI roles. This highlights a clear opportunity for the proposed BEng and BSc AI programs to address these gaps.

BEng vs BSc: Roles and Differentiation

Respondents clearly differentiate the BEng in AI Engineering from the BSc in AI based on implementation versus theory, hardware and system design versus analytics and modeling, and regulatory responsibility. BEng graduates are recognized for their strengths in engineering design, electronics and circuits (including higher voltages and relevant standards), system and communication architecture, and integrating AI into complex hardware and software systems such as robotics or embedded and edge devices. They are also associated with engineering licensure (for example, membership in l'Ordre des ingénieurs du Québec), regulatory compliance, project management, and complex system design. These competencies are especially valued in sectors focused on safety, standards, and physical infrastructure.

In contrast, BSc graduates are expected to focus more on the theoretical and mathematical foundations of AI and data science, with greater flexibility for domain electives such as biochemistry, neuroscience, linguistics, or geography. These electives inform model design, data interpretation, and ethical considerations. BSc graduates are well-suited for roles in model and algorithm development, data analysis, and research-oriented problem solving, often collaborating with engineering teams on feasibility and implementation. Respondents often summarize this distinction as BEng for "engineering, system design, and deployment" (including backend, robotics, and hardware enablement), and BSc for "science and analytics" (theoretical understanding, model building, and domain-informed AI research).

On the hiring side, some organizations explicitly state that electrical, embedded, and industrial AI roles (e.g., hardware design for NPU-accelerated products, firmware engineering with neural nets, industrial AI engineers, systems and software designers) either require or strongly benefit from a CEAB-accredited engineering background. Others indicate that higher-level software roles and data science positions can often be filled by BSc graduates, though at least one organization in Montreal stresses that a BSc alone is insufficient when an engineering degree is mandated. Overall, the feedback supports a deliberate, explicit differentiation: BEng as the pathway for regulated, hardware/system-focused AI engineering; BSc as the pathway for theory-heavy, model-centric, and domain-integrated AI roles.

Desired Graduate Profile and Curriculum Priorities

Essential knowledge and skills

The survey of industry experts identifies a clear set of technical foundations and skills that are essential for entry-level AI graduates.

Topics and Areas

- Core Technical Foundations
- Strong programming skills, particularly in Python and C/C++, along with a solid understanding of algorithms, machine learning, and deep learning fundamentals, are consistently prioritized. Respondents emphasize the need for a strong mathematical background, including linear algebra, vector calculus, probability, statistics, optimization, and thorough training in artificial neural networks and algorithm design. They also highlight the importance of precise logical reasoning and careful consideration of edge cases, noting that many current graduates lack strength in these areas.
- Data and Software Infrastructure
- Data engineering, data pipelines, and software engineering best practices such as version control, testing, and CI/CD are considered critical for entry-level roles. Respondents also highlight the importance of MLOps, including model deployment, monitoring, containerization, and the use of cloud AI services (e.g., AWS, Azure, GCP, Vertex AI, Bedrock). Graduates are expected to understand that AI models must be integrated into robust, scalable software and data infrastructure to deliver real value
- Applied and Domain-Specific AI
- Domain knowledge in areas such as healthcare, finance, manufacturing, telecom, defence, and industrial

contexts is considered an important complement to core technical skills. Experts cite applications including quality management in advanced manufacturing, data privacy, and business-focused metrics. They also highlight emerging areas such as embedded and edge AI, neural network accelerators, agentic development, and embodied or agent AI as growing priorities for future curricula

- Research Literacy and Self-Directed Learning
- Respondents emphasize that students must learn to read and critically engage with research papers, relying on academic sources rather than popular media. They caution against "vibe coding" and over-reliance on GitHub snippets or LLM output without proper understanding. A strong capacity for self-directed, continuous learning is considered essential in this rapidly evolving field, where staying current with new methods and tools is a core professional responsibility.

Skills in high demand

- **Problem-Solving and Analytical Ability**
  Problem-solving and analytical skills receive the strongest endorsement among all competencies: 13 of 17 respondents rate them as "critically important" and 4 as "very important" for entry-level roles. Experts stress the importance of designing new models, reasoning about architecture, selecting and curating appropriate training data, and understanding the limitations and trade-offs of AI systems, rather than simply applying pre-built tools or templates.
- **Technical Proficiency and Coding Fluency**
  Technical proficiency, including programming, algorithms, machine learning, and data handling, is rated at least moderately important by all respondents, with 4 rating it "critically important" and 4 "very important." Qualitative feedback highlights a gap in many graduates' coding fluency and their ability to efficiently solve complex problems in languages such as Python, Java, and C#. Employers expect graduates to write, read, and review code at a professional standard, especially as LLM-generated code becomes more prevalent and requires critical evaluation.
- **Teamwork, Communication, and Project Execution**
  Teamwork and collaboration are rated "critically important" by 9 respondents and "very important" by 5. Communication skills are rated "very" or "critically important" by 12 out of 17 respondents. Experts also emphasize project and product execution skills, including defining measurable success criteria, estimating effort, managing work packages and critical paths, articulating business value such as translating model improvements into cost or revenue impact, and conducting post-mortems to turn failures into systematic learning and process improvement.
- **Ethics, Risk Awareness, and Responsible Practice**
  Ethical judgment and integrity are rated "very important" or "critically important" by 15 of 17 respondents. Risk management and awareness of AI-related risks receive similar emphasis, with 13 rating them "very" or "critically important." Respondents call for explicit coverage of responsible AI topics, including explainability, fairness, bias, privacy, data sovereignty, and sustainability, such as environmentally and cost-efficient deployment and Edge AI. These are considered essential, especially for safety-critical and regulated applications.
- **Commitment to Continuous Learning**
  Commitment to continuous or lifelong learning is rated "critically important" by 6 respondents and "very important" by 5 out of 17, with only 1 rating it unimportant. Several experts specifically mention "passion" and intrinsic motivation as crucial, linking them to the ability to keep learning, adapt to rapid change, and maintain a competitive skill set throughout a career.

Importance of interdisciplinary expertise

- Interdisciplinary knowledge is widely valued, though its importance varies by sector and role. Of 17 respondents, 8 rate it as "very important," 7 as "somewhat important," and only 2 view it as less or not important. Qualitative responses identify relevant areas such as healthcare and medicine, telecommunications, defence, industrial applications, standards and regulatory frameworks, product and project management, operations, market intelligence, and data privacy or PII.
- Experts emphasize that AI is not a standalone activity but part of broader projects, systems, and business

outcomes. Successful deployment requires the ability to select viable projects, articulate value clearly, align AI solutions with operations and product lifecycles, and navigate legal, regulatory, and ethical constraints. These responses suggest that AI programs should intentionally integrate domain exposure, regulatory awareness, and managerial decision-making with technical content.

Overall professional competencies

- Industry experts consistently advocate for a holistic professional profile rather than narrow technical training. The strongest consensus centers on problem-solving and analytical skills, supported by strong math, coding, and algorithmic foundations. Technical proficiency is expected, but it must be integrated with sound engineering practice, clear thinking, and the ability to reason about complex systems.
- Teamwork, communication, and practical experience with real-world projects, including capstones, internships, and industry collaborations, are also important, though opinions vary on whether they are "very" or "critically" important. Ethical judgment, integrity, and risk-aware practice are seen as key differentiators, especially in sectors where safety, compliance, and long-term maintainability are priorities. The high value placed on continuous learning, research literacy, and passion highlights that employers expect AI graduates to be adaptable, reflective practitioners who can evolve with the field, critically evaluate new tools, including LLMs, and contribute to both the creation and responsible stewardship of AI systems over time.

Experiential Learning and Industry Collaboration

Employers seek entry-level AI candidates with authentic, demonstrable experience. Capstone projects, internships, co-ops, and open-source contributions are most valuable when they involve original data collection, comprehensive model evaluation, and clear evidence of deep understanding. Respondents emphasize that program-mandated projects matter only if they show genuine ownership and technical rigor. They prioritize passion, logical thinking, communication skills, and self-initiative, such as self-directed projects or relevant work experience, over superficial portfolio items.

Industry partners are highly willing to support various experiential opportunities, such as onsite and virtual internships, course-based and capstone projects, short field projects, research collaborations, and mentorship. They are also open to deeper collaboration through guest lectures, advisory committees, feedback on course and program design, joint research and innovation projects, networking events, and curriculum review. There is less support for hackathons, case studies, and job shadowing.

Organizations are most willing to support **short, targeted professional certifications or AI training programs for employees**. Most respondents believe these are somewhat or extremely likely to receive subsidies.

Anticipated Future AI Challenges

They recognize emerging AI challenges, such as the commoditization of coding, greater emphasis on specification and testing, infrastructure and energy constraints, AI safety and responsible use, evolving regulations and standards, data sovereignty and security, bias, privacy, and broader ethical issues. There is concern that overreliance on AI tools may diminish junior developers' skills. Over the next 5 to 10 years, respondents expect AI to become foundational in complex systems, increasing demand for professionals with strong technical **fundamentals, ethical and regulatory awareness, and the ability to design, evaluate, and maintain high-quality AI systems**, including updating or replacing poorly built systems.

These insights directly from industry experts provide a focused roadmap for curriculum development of the proposed program.

See Appendix 3 for detailed survey results.

4.1.6. Current and Projected AI Job Market in Quebec and Canada

A dataset from Lightcast provides comprehensive labor market data, including job postings, insights on skills, education, industry trends, and job titles related to AI in Quebec. This data covers a 10-year period from February 2016 to

February 2026 and shows a thriving job market for AI positions for individuals with a bachelor's degree or higher. Specifically, there are 2,390 unique job postings from 425 different employers in Quebec. The median advertised salary, based on 7% of the total postings, is $50.34 per hour.

In comparison, the data for all of Canada reveals 15,508 unique job postings from 1,862 employers. The median salary across Canada, based on 12% of the total postings, is reported to be $54.58 per hour. This indicates a strong demand and competitive compensation for AI expertise at the national level.

Ten-year Job Posting Trends

The ten-year trend in AI job postings for individuals with a bachelor's degree or higher, based on Lightcast data for Quebec and across Canada, shows a period of steady growth followed by a tactical slowdown from 2022 to 2024. After this slowdown, there is expected to be a significant increase in AI job postings, which nearly doubles again starting in mid-2025. Reports from Statistics Canada, the OECD, and Labour Force Survey (LFS) data largely align with the Lightcast findings regarding a surge in AI job demand beginning in mid-2025. Although their methodologies differ, Lightcast tracks "real-time" online job postings while government reports focus on broader employment levels, these major sources confirm that AI adoption reached a critical "inflection point" in 2025.

The Mid-2025 Surge: Statistics Canada's Canadian Survey on Business Conditions indicated that the percentage of businesses using AI doubled from 6.1% in early 2024 to 12.2% by the second quarter of 2025. This increase correlates directly with the spike in job postings observed by Lightcast and Indeed, where mentions of AI in job advertisements nearly doubled, reaching 6% of all postings by the end of 2025.

Data from 2025 indicates a shift in demand, with roles that augment AI (which involve collaboration with AI) growing by 2.9%, outpacing roles that compete with AI (those that could be replaced by AI).

View the job posting trends visuals in the full Lightcast Job Posting Reports found in Appendix 3.

Top Five Hiring Companies

The table below shows the top five employers of Artificial Intelligence specialists along with the total number of unique postings for each employer in Quebec and Canada over the past five years.

Rank	Employer in Quebec	Postings (Quebec)	Employer in Canada	Postings (Canada)
1	Intact Financial Corp	142	IBM	858
2	Deloitte	114	Deloitte	851
3	Bell Canada	99	Funded.club	431
4	National Bank of Canada	84	AMD	404
5	IBM	75	Cognizant Technology Solutions	350

Both the OECD and Lightcast identify the same "Top 3" sectors driving this demand: Professional, Scientific and Technical Services (accounting for nearly 30% of postings), Financial Services, and Information/Communication.

Top Job Titles

The table below shows the top seven AI-related job titles in demand along with the number of unique postings for each job title for both Quebec and Canada:

Rank	Job Title (Quebec)	Unique Postings (Quebec)	Job Title (Canada)	Unique Postings (Canada)
1	Data scientists	1,120	Data scientists	6,340

2	Software developers and programmers	760	Software developers and programmers	4,370
3	Database analysts and data administrators	174	Database analysts and data administrators	1,548
4	Computer engineers (except software engineers and designers)	109	Software engineers and designers	1,209
5	Software engineers and designers	95	Computer engineers (except software engineers and designers)	1,080
6	Information systems specialists	73	Information Systems Specialists	491
7	Mathematicians, statisticians and actuaries	55	Mathematicians, statisticians and actuaries	440

See the two full Lightcast reports in Appendix 3 for more details.

4.1.7. Future prospects for graduates

AI engineering, like all engineering programs at Concordia, will be accredited by Engineers Canada. The accreditation process includes evaluation by the Canadian Engineering Accreditation Board (CEAB) carried out at periodic intervals (currently every six years). Accreditation of an engineering program ensures that the necessary knowledge and skills are being acquired to practice engineering safely and responsibly in Canada. Although the accreditation requirements evolve, the principles of assuring competency in key areas remains consistent. The proposed AI engineering program provides students with the graduate attributes required by Engineers Canada and exceeds the Academic Unit (AU) minima in all categories, which is presented in Section 7.1.3.

Labour Market Demand and Opportunities

Graduates from the BEng in AI Engineering program will enter a robust and expanding labor market with exceptional growth prospects. According to the National Occupational Classification (NOC 21211)[13], AI specialists are primarily classified as Data Scientists, encompassing roles such as AI analysts, consultants, machine learning engineers, and data architects. The Quebec labor market demonstrates strong demand for these skills, with approximately 59% of the provincial workforce in jobs with high exposure to AI as of 2024-2025. View the original report at Institut de la statistique du Québec.

The current workforce of approximately 2,500 Data Scientists in Quebec (2021 data) is heavily concentrated in Montreal, which hosts 82% of the province's professionals in this field (~2,060 workers). The job outlook for 2024-2027 remains moderate to good, with steady growth expected despite some market stabilization following the post-pandemic surge.

Compensation and Career Advancement

AI engineering roles command premium compensation packages that significantly exceed provincial averages. Entry-level positions for ML/AI Engineers range from $85,000-$125,000 annually, advancing to mid-level salaries of $125,000-$205,000, and senior-level compensation of $165,000-$235,000. Data Scientists can expect starting salaries around $75,000-$100,000, progressing to $130,000+ at senior levels. AI Research Scientists command the highest premiums, with entry-level positions starting at $100,000-$150,000 and senior roles exceeding $150,000.[14]

These compensation levels reflect the high educational requirements of the field, where 63% of NOC 21211 professionals hold university degrees above the bachelor level, positioning BEng in AI Engineering graduates competitively in this elite cohort.

[13] Employment and Social Development Canada. (2025). Data scientists (NOC 21211.00). National Occupational Classification. https://noc.esdc.gc.ca/OaSIS/OaSISOccProfile?code=21211.00&version=2025.0

[14] 2727 Coworking. (2025). Montreal tech salary guide 2025. https://2727coworking.com/articles/montreal-tech-salary-guide-2025

Industry Sectors and Employment Opportunities

Quebec's AI ecosystem spans diverse industries, providing graduates with multiple career pathways[15]:

- Technology Sector (Computer Systems Design - 21% of workforce): Major employers include global tech leaders such as Google (Google Brain & DeepMind), Meta (FAIR), Microsoft Research, and IBM, alongside successful local companies like Coveo, BrainBox AI, and Hopper.
- Financial Services (26% of workforce): The sector includes Borealis AI (Royal Bank of Canada), Intact Financial, National Bank of Canada, and international firms like Morgan Stanley and BNP Paribas.
- Public Administration (7-10%): Federal and provincial agencies increasingly require AI expertise for digital transformation and service delivery optimization.
- Aerospace and Manufacturing: Companies like Bombardier and CAE are integrating AI for automation and simulation applications.
- Specialized AI Agencies: Quebec City hosts growing companies like Vooban, Junifia, Zenidata, and emerging firms in mining automation and climate modeling.

Regional opportunities

While Montreal dominates the market as a global AI hub housing the world's largest concentration of academic deep learning researchers, other regions present unique opportunities. Quebec City supports over 500 high-tech companies focusing on robotics and life sciences, while areas like Lanaudière and Laurentides show "Very Good" outlook ratings due to high replacement demand relative to available talent pools.

Advanced Study and Research Pathways

Graduates seeking advanced research careers can access Quebec's world-class ecosystem through partnerships with Mila and affiliated universities[16]. Specialized research opportunities span:

- Natural Language Processing and Computer Vision at **Université de Montréal**
- Reinforcement Learning and Robotics at **McGill University**
- Mobile Robotics and Autonomous Systems at **Polytechnique Montréal**
- Decision Sciences and Business Intelligence at **HEC Montréal**
- Intelligent Systems and Signal Processing at **ÉTS Montréal**
- Applied Artificial Intelligence Research at **Concordia University** through the Concordia-Mila partnership, where students can pursue graduate degrees under Mila-affiliated faculty supervision, with access to specialized training programs including the Mitacs-Concordia AI Training Series and the Graduate Microprogram in Applied AI

Strategic research priorities include AI4Science, environmental applications, and responsible AI development, positioning graduates at the forefront of emerging technological frontiers.

Societal Impact and Professional Mobility

BEng in AI Engineering graduates will play crucial roles in addressing Quebec's digital transformation challenges. With only 12.2% of businesses currently utilizing AI, graduates can lead SME digital transformation initiatives while helping close the critical skills gap that Canadian businesses identify as the primary barrier to AI adoption.

[15] Data Sources: Information for these employment insights is compiled from investment and economic agencies (Investissement Québec and Montréal International), live job portals monitored December 2025–March 2026 (LinkedIn, Glassdoor, Indeed, and Canada's Job Bank), industry directories (Built In Montreal, Clutch, and F6S), and ecosystem reports (Mila Impact Reports and QuebecTech).

[16] Mila - Quebec Artificial Intelligence Institute. (n.d.). Core expertise. https://mila.quebec/en/research/core-expertise

Societal Contributions to Quebec:

- Economic Competitiveness: AI adoption in Quebec's manufacturing sector alone is expected to significantly reduce human error and optimize resource utilization, helping firms compete globally. Estimates suggest AI could boost the province's GDP by over $10 billion by 2030.
- Public Well-being: Graduates contribute to AI-driven tools that improve healthcare (e.g., cancer screening), precision agriculture, and environmental sustainability. AI applications in these domains can enhance quality of life, increase food security, and address pressing climate challenges.
- Ethical Leadership: By training in Quebec, which leads in responsible AI development, graduates help ensure technologies respect human rights and inclusion. They are equipped to deploy AI systems that are transparent, unbiased, and aligned with societal values.

Addressing Specific Needs-Analysis Issues:

- Closing the Skill Gap: Canadian businesses report difficulty finding employees with AI expertise as the top barrier to adoption. BEng graduates directly address this by providing the "build and maintain" skills required to integrate AI solutions.
- Supporting SMEs: Only 12.2% of businesses currently use AI. Graduates can lead the digital transformation of SMEs, which often lack the internal knowledge to identify business cases for AI. By assisting smaller firms, graduates drive broader economic benefits.
- Workforce Resilience: Rather than replacing jobs, AI is largely seen as complementary. BEng graduates are essential for designing systems that assist existing workers, focusing on higher value-added tasks rather than automation-led elimination. This helps build workforce adaptability and resilience.
- The program's emphasis on responsible AI development ensures graduates contribute to ethical technology deployment, supporting Quebec's leadership in human-rights-respecting AI applications across healthcare, environmental sustainability, and public service delivery.
- Professional mobility is enhanced through Quebec's specialized immigration pathways for AI workers, though graduates must secure positions with minimum salaries of $75,000 (outside Montreal) or $100,000 (within Montreal) to qualify.

4.2 Systemic Relevance and Opportunity

4.2.1. Artificial Intelligence programs in Canada

Across Canada, Artificial Intelligence is most often embedded within Computer Science and traditional engineering programs, rather than offered as standalone CEAB-accredited BEng degrees in Artificial Intelligence.

CEAB-Recognized AI Engineering Programs in Canada

There are currently three CEAB-recognized engineering programs with a primary focus on AI and its integration into engineered systems:

I. Ontario Tech University – B.Eng. (Honours) in Artificial Intelligence

- AI offered as a specialized track within Mechanical and Mechatronics Engineering.
- Emphasis on machine learning, deep learning, and industry-standard tools.
- Includes treatment of ethical issues (bias, privacy, employment).
- Common first-year engineering foundation followed by AI-focused specialization.

II. Western University – B.Eng. Science in Artificial Intelligence Systems Engineering (AISE)

- Five-year dual-degree model: AISE plus a second accredited engineering degree (e.g., Chemical, Civil, Electrical, Mechanical, Mechatronic Systems).
- Focus on applying AI in safety-critical, high-reliability engineered systems.
- Multiple specialized AI/ML courses (e.g., deep learning, online learning, algorithms, data structures).

III. Algonquin College – B.Eng. in Automation and Robotics

- Recently CEAB-accredited; bridges applied college learning and professional engineering.
- Integrates computer engineering, mechanical systems, and electrical design with advanced programming.
- Strong hands-on and lab-based focus, with mandatory co-op terms that may count toward P.Eng. experience.

Beyond these, AI at the undergraduate level in Canada is commonly offered as:

- Computer Science or Software Engineering degrees with AI specializations/streams (e.g., University of Waterloo, University of Alberta, University of Manitoba, Carleton University), typically including ~24–36 credits of AI-related courses within broader degrees.
- Applied or professional bachelor's degrees with AI/ML focus (e.g., Durham College, College of the North Atlantic, Seneca Polytechnic).

The table below summarizes bachelor's programs in AI and AI-specialized bachelor's programs in Canada (Other than Quebec)

	Institution	**Degree**	**Credits required in AI courses**
BEng programs in Artificial Intelligence	Ontario Tech University (ON)	Bachelor of Engineering (Honours) in Artificial Intelligence	~33 credits (11 courses + capstone)
	Western University (ON)	Bachelor of Engineering Science in Artificial Intelligence Systems Engineering (AISE)	~42 credits (~12-14 courses) + Electives
	Algonquin College, (ON)	Bachelor of Engineering – Automation and Robotics	~27 credits (~9 courses)
Undergraduate programs with AI Specialization/Stream (BSc/BComp/BASc/BEng)	Carleton University (ON)	Bachelor of Computer Science – Artificial Intelligence & Machine Learning stream	18-24 credits (~6-8 courses)
	College of the North Atlantic (NL)	Bachelor of Applied Information Technology – Artificial Intelligence & Machine Learning	~36 credits (10 + capstone)
	Durham College (ON)	Bachelor's degree (honours) – Artificial Intelligence	~48 credits (16 courses + 1 capstone + 1 field placement)
	Trent University (ON)	BSc or BA - Honours - in Artificial Intelligence	~33 credits (11 courses)
	University of Alberta (AB)	Bachelor of Science with Major in Computing Science – Artificial Intelligence option	~24 credits (8 courses)
	University of Manitoba (MB)	Bachelor of Science in Computer Science – Artificial Intelligence	Up to 27 credits (approx. 9 courses)
	University of Waterloo (ON)	Bachelor of Computer Science - Artificial Intelligence Specialization	~24 credits (8 courses)
	University of Waterloo (ON)	Bachelor of Software Engineering - Artificial Intelligence Specialization	~24 credits (8 courses)
	University of Waterloo (ON)	Bachelor of Math - Artificial Intelligence Specialization	~24 credits (8 courses)
	Seneca Polytech (ON)	Bachelor of Engineering (Software Engineering)-Heavy emphasis on AI	~24-30 credits (8-10 courses)

In addition, Canadian institutions offer numerous **minors**, **certificates**, **microprograms**, and **diplomas** in AI and related areas (e.g., University of Alberta's "AI Everywhere" certificate; AI Engineering minors at the University of Toronto and

University of Waterloo; AI microprograms at the University of Ottawa and University of Manitoba). These are mainly designed to:

- Upskill students from other majors.
- Support professional development and reskilling.
- Complement, rather than constitute, full engineering credentials in AI.

The following table summarizes these offerings across the major Canadian institutions:

Institution	Credential Type	AI Focus / Credits	Target Audience
U of Alberta	AI Everywhere Certificate	15 units (5 courses)	All undergraduate students
U of Toronto	AI Engineering Minor	~18–24 credits	Engineering students only
U of Waterloo	AI Engineering Minor	~24 credits	Engineering students
Dalhousie U	**AI & Intelligent Systems Cert.**	~12–15 credits	Computer Science students
U of Manitoba	AI Micro-certificate	3 courses	Professionals & students
U of Ottawa	Interdisciplinary AI Microprogram	9 units (3 courses)	Interdisciplinary students
Athabasca U	AI & ML Minor	18 credits	B.Sc. students
Concordia U	Applied AI Microprogram	8 credits (2 courses)	Alumni & Professionals
McGill U	Applied AI Prof. Development Cert.	Short-format	Working Professionals
BCIT	AI & ML Diploma Option	2-year program	Full-time diploma students

Within this Canadian landscape, CEAB-accredited BEng programs centered explicitly on AI remain rare. Ontario Tech and Western currently lead this space in Ontario, with Algonquin emphasizing robotics and automation. No comparable BEng in AI exists in Quebec.

4.2.2. International Benchmarks

Internationally, a small number of leading institutions have introduced high-density, engineering-focused AI degrees that help define global expectations for such programs. These benchmarks show that Concordia's proposed Beng in AI is aligned with emerging international norms while offering distinctive features.

University of Pennsylvania – BSE in Artificial Intelligence (USA)

The University of Pennsylvania's BSE in Artificial Intelligence is the first undergraduate AI engineering degree in the Ivy League. It is jointly administered by Electrical and Systems Engineering (ESE) and Computer and Information Science (CIS), reflecting a cross-departmental model comparable to Concordia's proposed Artificial Intelligence Engineering Virtual Unit (AIE).

Penn uses Course Units (CUs), where 1 CU corresponds roughly to a 3–4 credit course. The curriculum includes:

- AI Core (6 CUs, ~18 credits): Introductory and intermediate AI, machine learning, signals and systems, optimization and control, vision/language, and a project course.
- AI Electives (6 CUs, ~18 credits): Advanced ML, deep learning, robotics, graph neural networks, trustworthy AI.
- Computing Core (5 CUs, ~15 credits): Programming, data structures, algorithms, big data.
- Math & Science (7 CUs, ~21 credits): Calculus, discrete mathematics, linear algebra, probability, statistics for data science.
- Senior Design (2 CUs, ~6 credits): A year-long design experience embedded in ESE or CIS labs.
- General/Ethics (11 CUs, ~33 credits): AI ethics, cognitive science, social sciences, humanities.

Penn thus mandates approximately 12 CUs (~36 credits) of direct AI coursework, plus a substantial design sequence. This aligns closely with the proposed 30–36 AI-credit range in Concordia's BEng in AI, indicating that Concordia's AI depth is globally competitive. The cross-departmental structure at Penn also parallels Concordia's ECE–CSSE–CIISE collaboration, though Concordia will emphasize systems security and deployment more strongly than cognitive science.

Hong Kong – High-Density BEng AI Programs (Washington Accord)
Hong Kong's top universities offer AI-related BEng programs that are recognized as substantially equivalent to CEAB programs through the Washington Accord. They exhibit very high AI course density and strong ties to financial technology and smart city applications:

- **Chinese University of Hong Kong (CUHK) – BEng in Artificial Intelligence: Systems and Technologies (AIST)**
  - Interdisciplinary program involving Computer Science, Electronic Engineering, and Information Engineering.
  - Offers specialized streams in Biomedical Intelligence, Intelligent Manufacturing, Human–AI Interaction, and Smart City.
  - Up to 17 dedicated AI courses (~45–51 credits), making it one of the most AI-intensive undergraduate programs globally.
- **University of Hong Kong (HKU) – BEng in Data Science and Engineering**
  - Housed in Computer Science, with a strong systems orientation.
  - Emphasizes data visualization and statistical computing alongside AI.
  - Features a mandatory integrated capstone tailored to Hong Kong's financial and logistics sectors.
- **Hong Kong University of Science and Technology (HKUST) – BEng in Decision Analytics (AI track)**
  - Focuses on prescriptive analytics and AI for decision-making.
  - Strong concentration in stochastic modelling and optimization, providing a mathematically intensive AI foundation.

These programs confirm that leading AI engineering degrees typically include **30–50 credits of AI-focused coursework**, extensive design/capstone components, and strong industry integration. Concordia's BEng in AIE, with **67 credits** of specialized AI and systems-integrated coursework—including advanced design and capstone experiences—is consistent with global high-tier standards while establishing a new benchmark for multidisciplinary AI Engineering.

Other Global Reference Programs
Additional internationally recognized programs further illustrate typical characteristics of strong AI degrees:

- Nanyang Technological University (NTU, Singapore) – B.Sc. in Data Science and AI: Jointly offered by Computing and Mathematical Sciences, with a pronounced emphasis on statistical and mathematical foundations.
- Tsinghua University (China) – Bachelor in AI: Elite AI track with extensive industry partnerships and a focus on large-scale AI systems.
- ETH Zurich (Switzerland) – B.Sc. in Computer Science (AI Track): A CS degree with a renowned AI concentration, particularly strong in robotics and visual computing, emphasizing hardware–software integration.
- IE University (Spain) – B.Sc. in Computer Science & AI: Project-based, "AI for Business and Society" orientation, accredited under the Bologna Process.
- Tetr (Global) – B.Sc. in Artificial Intelligence: An immersive multi-country model with rotations through several global tech hubs.

Collectively, these benchmarks indicate that high-quality AI degrees are:

- Interdisciplinary (computing, math, systems, often with a human or societal dimension).
- Supported by at least 30 credits of AI-specific coursework.
- Deeply integrated with industry and applied research.

The proposed Concordia BEng in AIE fits this emerging global profile while adding a distinctive focus on secure-by-design AI, trustworthy systems, and virtual-unit governance.

4.2.3. Similar and Related Programs in Quebec

Quebec is a global hub for AI, with a wide range of undergraduate minors, certificates, and graduate programs. However, there is currently **no CEAB-accredited BEng program dedicated to AI** in the province.

The following table outlines representative AI-related offerings:

Institution	Program Title	Program Type	# of Credits Dedicated to AI*
McGill University	Minor Applied Artificial Intelligence	Minor (Undergrad)	22–25
McGill University	Major Computer Science - AI	B.Sc. (Honours/Major)	~24
Concordia University	Applied AI Microprogram	Graduate Microprogram	8
U. de Montréal (UdeM)	D.E.S.S. en Apprentissage Automatique	Specialized Grad Diploma	30
U. de Montréal (UdeM)	Maîtrise en Apprentissage Automatique	Master's (Professional)	45
U. de Montréal (UdeM)	IA au travail: Utilisation responsable	Certificate (Undergrad)	30
Université Laval	D.E.S.S. en Intelligence Artificielle	Specialized Grad Diploma	24
Université Laval	Microprogramme en Données Massives	Microprogram (Grad)	12
Polytechnique Montréal	Maîtrise professionnelle (ou DESS) modulaire en Génie informatique Option Intelligence artificielle en divertissement numérique interactif	Master's (Professional)	45
UQAC (Chicoutimi)	Mineure en Science des Données et IA	Minor (Undergrad)	30
UQAC (Chicoutimi)	Master's degree in computer science (artificial intelligence)	Master's (Research)	45
UQAM	Maîtrise en Informatique (Option IA)	Master's (Research)	~45
HEC Montréal	M.Sc. Intelligence d'affaires	Master's (Professional)	45

**Note: For Bachelor's degrees and minors, this represents only the credits specifically allocated to AI/ML courses, excluding core computer science or math foundations. Master's and D.E.S.S. credits represent the total program weight, which is typically entirely focused on AI/Data Science.*

Key characteristics of the Quebec landscape are:

- A strong "bacc par cumul" model at French-language universities, combining multiple 30-credit certificates (e.g., AI, computer science, cybersecurity) into flexible bachelor's degrees.
- A dense graduate and research ecosystem (Mila, IVADO, multiple D.E.S.S. and master's programs) emphasizing advanced theory and industry collaboration.
- A focus on minors, certificates, microprograms, and professional development, rather than integrated, CEAB-accredited AI engineering degrees.

In short, Quebec's AI offerings are rich but fragmented and primarily non-engineering at the undergraduate level. There is currently no unified AI engineering pathway that combines hardware, software, systems integration, and engineering ethics within a single accredited BEng.

4.2.4 Market Position and Distinctive Contribution of the Proposed BEng in AIE

The proposed BEng in Artificial Intelligence Engineering at Concordia would be the first **CEAB-accredited AI engineering program in Quebec** and one of very few in Canada. Situated in Montreal—home to Mila and IVADO—it would leverage a world-leading AI ecosystem while filling a clear structural gap in the provincial university system.

Distinctive Features Relative to Canadian and International Programs

The program is differentiated by four core pillars:

1. **Virtual AI Engineering Unit (AIE) and Multi-Department Governance**
    - The AIE Virtual Unit integrates Electrical and Computer Engineering (ECE), Computer Science and Software Engineering (CSSE), and the Concordia Institute for Information Systems Engineering (CIISE).
    - This design creates a balanced, full-stack AI curriculum, covering hardware and embedded systems, algorithms and software, and large-scale, secure AI deployment.
    - It explicitly avoids disciplinary silos and mirrors (while extending) the cross-departmental models seen at UPenn and CUHK.

2. **Systems and Infrastructure Focus via CIISE**
    - Integrates cybersecurity, cloud infrastructure, and safety-critical systems into AI engineering training.
    - Prepares graduates not only to design models, but to deploy AI securely and reliably in complex industrial and societal environments, aligned with the needs of Quebec's aerospace, finance, health, and cybersecurity sectors.

3. **Trustworthy and Explainable AI as Technical Outcomes**
    - Treats fairness, explainability (XAI), and accountability as explicit engineering competencies, not only as general ethics topics.
    - Aligns with Quebec and Montreal leadership in AI ethics (e.g., the Montreal Declaration) and with emerging provincial and federal frameworks for responsible AI.
    - Addresses a recognized global gap: engineers capable of designing AI systems that are high-performing, secure, and regulation-ready.

4. **Location within Montreal's AI Ecosystem**
    - The only BEng AIE program located in the core Mila–IVADO–Montreal AI cluster.
    - Access to a dense network of AI research labs, startups, and established industries for co-op, internships, and capstone projects.
    - Strong synergy with the Concordia Applied AI Institute, creating a direct pipeline between undergraduate education, research, and industry.

4.2.5. Impact on Existing Programs

Within Concordia, the proposed BEng in AIE is designed to be **complementary** to existing programs in ECE, CSSE, and CIISE:

- It will attract students who are specifically seeking a dedicated AI engineering pathway, including those who might otherwise leave Quebec for AI-focused programs in Ontario or abroad.
- It will consolidate AI-related offerings from participating departments, creating a clear, structured engineering program rather than dispersing AI content across multiple degrees.
- Shared foundational and elective courses will maintain healthy enrolments in existing programs, while new AI-specific courses will expand the overall portfolio rather than duplicate content.

At the Quebec system level, the primary impact is to **fill a clear gap**: there is no CEAB-accredited BEng in AI currently offered. The new program will build on, rather than replace, existing minors, certificates, D.E.S.S., and master's programs by providing:

- A robust undergraduate pipeline of students prepared for advanced AI studies and research.
- Well-trained graduates ready for AI-intensive roles in Quebec's key sectors.

4.2.6 Recruitment from the Quebec Population

The absence of an in-province CEAB-accredited AI engineering program currently encourages some Quebec students to:

- Enroll in out-of-province AI-oriented engineering or computing programs.
- Assemble ad hoc combinations of computer science, engineering, and AI certificates to approximate an AI engineering profile.

The proposed BEng in AIE will:

- Provide a clear, accredited P.Eng. pathway in AI within Quebec, improving retention of talented students.
- Attract graduates of relevant CEGEP programs (pre-university science and technical programs in computer science, software engineering, and electrical engineering) who seek a focused AI engineering degree.
- Offer a credential that is recognizable to employers and aligned with Quebec's and Canada's growing demand for AI-capable engineers.

4.2.7. Partnerships and Collaborations

By having Concordia University in Montreal, the university benefits from direct access to a globally recognized AI ecosystem. Montreal is a global AI hub by combining top-tier academic research with a dense network of industry, start-ups, and public-sector partners. This concentration of talent, labs, funding programs, and real-world deployment opportunities helps accelerate collaboration, training, and innovation, creating a uniquely rich environment for AI educational programs, research, and impact.

Many professors from ECE, CSSE, and CIISE are founding and active members of the Concordia Applied AI Institute (A2I), Concordia's university-wide hub for applied AI. A2I's mission is to demystify AI and accelerate its responsible adoption by enabling real-world applications and collaborations across the sciences, engineering, arts, business, and the humanities. Through interdisciplinary research and partnership-driven projects, A2I helps translate AI advances into practical tools and solutions, encouraging researchers to put AI into practice, tackle complex societal and industrial challenges, and identify opportunities where AI can deliver measurable benefits for people and organizations. The institute has strong collaborations with industry, government organizations, and communities.

In addition, CSSE professors Dr. Eugene Belilovsky, Dr. Yang Wang, Dr. Mirco Ravanelli, Dr. Elvis Dohmatob, and Dr. Mahdi S. Hosseini are Associate Academic Members of Mila (Quebec Artificial Intelligence Institute), an internationally recognized AI research institute that brings together professors, students, and research staff to advance scientific discovery and promote the responsible development of AI for societal benefit. Mila also acts as a province-wide hub, connecting researchers across Université de Montréal, McGill University, Polytechnique Montréal, HEC Montréal, Université Laval, Université de Sherbrooke, École de technologie supérieure (ÉTS), and Concordia University.

Moreover, a large number of professors from ECE, CSSE, and CIISE have held Canada Research Chairs, Concordia University Research Chairs, and Gina Cody Research and Innovation Fellowships in AI and applied AI, spanning areas such as biomedical engineering, autonomous vehicles, robotics, AI for IT Operations, computer vision, AI-Human Interaction, and related fields.

From CSSE:

- Dr. Tristan Glatard, Founding Director, Co-Director, Concordia Applied AI Institute (2020-2024). Canada Research Chair (Tier II) in Big Data Infrastructures for Neuroinformatics.
- Dr. Yann-Gaël Guéhéneuc, Canada Research Chair (Tier I) in Empirical Software Engineering
- Dr. Elvis Dohmatob, Canada Research Chair (Tier II) in Computing for the Greater Good
- Dr. Emad Shihab, Concordia University Research Chair in Data Analytics for Software Ecosystems
- Dr. Brigitte Jaumard, Concordia University Research Chair in Optimization of Communication Networks
- Dr. Yiming Xiao, Concordia University Research Chair in Intelligent & Intuitive Surgical Technology
- Dr. Shin Hwei Tan, Gina Cody Research Chair in Computer Science and Software Engineering
- Dr. Ching Y. Suen, Concordia Honorary Chair on AI & Pattern Recognition

From CIISE:

- Dr. Nizar Bouguila, Founding Director, Co-Director, Concordia Applied AI Institute. Concordia University Research Chair in Applied Artificial Intelligence.
- Dr. Jun Yan, Concordia University Research Chair in Artificial Intelligence in Cybersecurity and Resilience. Co-Titulaire de la Chaire de recherche Concordia-MCN sur la cybersécurité et la résilience des réseaux de l'administration publique, in collaboration with the Ministère de la Cybersécurité et du Numérique (MCN) du Québec.
- Dr. Mourad Debbabi, Concordia – Hydro-Québec – Hitachi Systems Security Inc. Partnership Research Chair in Enhancing the Resilience and Security of the Smart Grid. Co-Titulaire de la Chaire de recherche Concordia-MCN sur la cybersécurité et la résilience des réseaux de l'administration publique, in collaboration with the Ministère de la Cybersécurité et du Numérique (MCN) du Québec.
- Dr. Suryadipta Majumdar, Co-Titulaire de la Chaire de recherche Concordia-MCN sur la cybersécurité et la résilience des réseaux de l'administration publique, in collaboration with the Ministère de la Cybersécurité et du Numérique (MCN) du Québec.
- Dr. Chadi Assi, Concordia University Research Chair in broadband wireless networks.
- Dr. Carol Fung, Gina Cody Research Chair in Cybersecurity and the Internet of Things.
- Dr. Lingyu Wang, NSERC/Ericsson Senior Industrial Research Chair in Software-Defined Networking and Network Functions Virtualization Security (2000-2025)
- Dr. Jeremy Clark, NSERC/Raymond Chabot Grant Thornton/Catallaxy Industrial Research Chair in Blockchain Technologies (2000-2025)
- Dr. Roch Glitho, NSERC/Ericsson/ENCQOR 5G Senior Industrial Research Chair in Cloud and Edge Computing for 5G and Beyond (2000-2025). Follow of Engineering Institute of Canada.

From ECE:

- Dr. Habib Benali, Tier 1 Canada Research Chair in Biomedical Imaging and Healthy Aging
- Dr. Krzysztof Skonieczny, Tier 2 Canada Research Chair in Aerospace Robotics
- Dr. Hassan Rivaz, Concordia University Research Chair Medical Imaging with Deep Learning
- Dr. Kash Khorasani, Honorary Tier I Concordia Research Chair in Control of Autonomous Network of Unmanned System
- Dr. Abdelwahab Hamou-Lhadj, Gina Cody Research and Innovation Fellow, Trustworthiness of Systems-of-Systems Using AI for IT Operations
- Dr. Yan Liu, Gina Cody Research and Innovation Fellow, Data-driven Proactive Planning and Recommendation Using Heterogeneous Spatiotemporal Data

4.3 Institutional Relevance and Opportunity

The proposed BEng in Artificial Intelligence Engineering (AIE) directly advances Concordia University's mission and nine strategic directions by leveraging the established expertise of the Gina Cody School of Engineering and Computer Science and the Applied AI Institute.

4.3.1 Integration into Institutional Plans and Strategic Directions

The program supports several key institutional directions:

Strategic Research and Academic Excellence

The program advances the mission to **double research** capacity by embedding research-informed learning into project-based courses and capstones. By channeling undergraduates into the Applied AI Institute, NSERC, and IVADO ecosystems, the degree expands institutional impact in a high-priority area. To **teach for tomorrow**, the curriculum integrates rigorous mathematical fundamentals—including linear algebra, probability, and optimization—with advanced machine learning and autonomous systems. This ensures graduates possess the deep technical expertise required for emerging roles in digital and agentic AI.

Experiential Learning and Technical Innovation
Guided by the principle to **get your hands dirty**, the co-op–eligible program mandates extensive experiential learning through internships and applied research. Graduates will demonstrate proficiency in industry-standard tools, Python-based ecosystems, and cloud-deployment environments. The program's governance through the AI Engineering Virtual Unit (integrating ECE, CSSE, and CIISE) allows students to **mix it up**, fostering the multidisciplinary collaboration necessary to bridge software and hardware engineering. This structure enables Concordia to **experiment boldly**, piloting a curriculum that treats system reliability, risk management, and model robustness as core engineering outcomes rather than secondary electives.

Responsible Governance and Global Leadership
To **grow smartly**, the program addresses the surging demand for AI-specialized engineers who understand the complexities of data governance, privacy, and algorithmic bias. By focusing on standards and regulations, the degree prepares students to navigate evolving global AI frameworks and sector-specific compliance. As we **embrace the city and the world**, students will leverage partnerships with Mila and IVADO to tackle urban challenges in healthcare and transportation through a lens of transparency and accountability. Ultimately, as the first BEng of its kind in Quebec, this flagship program allows Concordia to **go beyond and take pride**, producing engineers who are technically elite, ethically grounded, and ready to lead the province's digital transformation.

4.3.2. Status Relative to Existing Programs and Enrolments
The BEng in AIE leverages existing strengths in **Electrical and Computer Engineering (ECE), Computer Science and Software Engineering (CSSE), and Information Systems Engineering (CIISE).** While these departments have seen sustained growth in AI and cybersecurity coursework, the proposed program fills a distinct gap by providing Quebec's first integrated, CEAB-accredited AI engineering degree.

The curriculum does not duplicate existing offerings; instead, it consolidates and extends AI-related courses currently distributed across three units into a coherent professional pathway. The program is positioned to attract:

- Students who currently leave Quebec for specialized AI engineering degrees.
- New applicants specifically seeking an AI-first engineering credential rather than a generalist degree.

To ensure the stability of related programs, the BEng in AIE shares a common first-year engineering foundation with existing degrees. Established ECE, CSSE, and CIISE programs will remain the primary choice for students seeking broader specializations, while the new AI-specific courses and capstones will expand Concordia's total course portfolio rather than fragmenting it. Overall, the impact is expected to be a net positive, increasing total engineering applications and reinforcing Concordia's leadership in a high-demand sector.

4.3.3. State of Research, Creation and Teaching in AI at Concordia
Concordia already has substantial research and teaching activity in AI and related fields:

- The Concordia **Applied AI Institute** coordinates AI research and training across faculties and maintains strong partnerships with industry and government.
- Faculty members in ECE, CSSE, CIISE, Mathematics & Statistics, and other units conduct research in machine learning, data science, optimization, robotics, computer vision, cybersecurity, information systems, and human–technology interaction.
- Graduate education includes AI-relevant MSc and PhD programs in engineering and computer science, as well as an Applied AI graduate microprogram.

The BEng in AI will formalize and extend this ecosystem at the undergraduate level by:

- Providing a structured pipeline of students prepared for AI-focused graduate research.
- Integrating ongoing research (e.g., NSERC, IVADO, industry-funded projects) into undergraduate labs, projects, and capstones.
- Supporting Concordia's strategic goal of more fully integrating research into every student's learning experience ("Double our research").

4.3.4. Demonstrated Institutional Expertise and Feasibility

Concordia has already developed particular expertise in AI through:

- Established programs in software and computer engineering, computer science, and information systems engineering that include AI, data science, and cybersecurity content.
- The Applied AI Institute and numerous externally funded projects in AI and data-driven technologies.
- Existing co-op and experiential learning infrastructure that connects engineering students to Montreal's AI-intensive industries.

Feasibility is supported by:

- Existing faculty strength across the three participating units, providing the critical mass needed to staff the core AI curriculum.
- Shared laboratory and computing infrastructure, including access to high-performance computing and GPU resources through research projects and central services.
- Proven governance and administrative capacity in the Gina Cody School to launch and sustain interdisciplinary undergraduate programs.

In sum, the proposed BEng in AIE is fully consistent with Concordia's mission and strategic directions, builds directly on established strengths in AI research and education, and represents a targeted, feasible and timely expansion in an area of clear institutional and societal opportunity.

5. PROGRAM OBJECTIVES

5.1 Output Profile

The Canadian Engineering Accreditation Board (CEAB) requires engineering programs to assess 12 graduate attributes[17]. The GCS has identified indicators for these 12 attributes, shown in Table 5.1. The mapping of the attributes and indicators throughout the curriculum is available in Section 7.5. These 12 attributes reflect key characteristics that graduates need to possess to become licensed engineers in Canada.

Table 5.1. Graduate attributes from the Engineers Canada Accreditation Board and selected indicators used in the GCS

Graduate attributes	**Indicators**
A knowledge base for engineering	Knowledge base of mathematics
	Knowledge base of natural science
	Knowledge base in specific domain
Problem analysis	Problem identification and formulation
	Modelling
	Problem solving
	Analysis (uncertainty and incomplete knowledge)
Investigation	Background and hypothesis formulation
	Designing experiments
	Conducting experiments and collection of data
	Analysis and interpretation of data
Design	Define the objective
	Idea generation and selection
	Detailed design
	Validation and implementation
Use of engineering tools	Ability to use appropriate engineering tools, techniques and resources

[17] *2025 Accreditation Criteria and Procedures*, pp. 7-9, available at https://engineerscanada.ca/accreditation/accreditation-resources/2026-2027-accreditation-cycle.

	Ability to select appropriate tools, techniques, and resources
	Demonstrate awareness of limitations of tools, create and extend tools as necessary
Individual and teamwork	Cooperation and work ethics
	Contribution: practical/conceptual
	Initiative and leadership
	Team dynamics
Communication skills	Writing process
	Information gathering
	Documentation
	Oral presentation
Professionalism	Role and responsibilities of professional engineers
	Professional practice
Impact of engineering on society and the environment	Societal impact of engineering
	Sustainability and environmental stewardship
Ethics and equity	Professional ethics and accountability
	Equity
Economics and project management	Fundamentals of economics
	Economics evaluation of projects
	Project planning and implementation
Life-long learning	Identifying missing knowledge and learning opportunities
	Continuous improvement and self-learning

We have identified the following key trends for undergraduate Artificial Intelligence engineering programs:

1. **Emphasis on Fundamentals:** A strong foundation in the mathematical and engineering fundamentals of AI, including linear algebra, probability, optimization, algorithms, and machine learning, is essential.
2. **Practical Experience:** Graduates must have hands-on experience in designing, implementing, training, and deploying AI models and intelligent systems in real-world applications.
3. **Focus on Data and Ethics:** Responsible use of data is central to AI. Graduates must understand data governance, privacy protection, algorithmic bias, and the ethical implications of AI-driven decision-making.
4. **Standards and Regulations:** Graduates must be familiar with emerging AI governance frameworks, standards, and regulations, including responsible AI guidelines, data protection laws, and sector-specific compliance requirements.
5. **Emerging Technologies:** Students should be exposed to rapidly evolving AI technologies, such as deep learning, generative AI, reinforcement learning, edge AI, agentic AI and autonomous systems, and understand their impact across industries.
6. **System Reliability and Risk Management:** Graduates should understand the risks associated with AI systems, including model robustness, safety, explainability, and failure modes, as well as methods for risk assessment and mitigation.
7. **Communication and Collaboration**: AI engineers must be able to communicate effectively and collaborate with multidisciplinary teams, including software and hardware engineers, domain experts, decision-makers, and end-users. These skills are emphasized throughout the program.
8. **Industry Tools and Technologies:** Graduates should be proficient with industry-standard AI tools and platforms, such as Python-based ecosystems, machine learning frameworks, data engineering pipelines, and cloud-based AI deployment environments.
9. **AI Ethics and Societal Impact:** Graduates must understand ethical and societal issues surrounding AI, including transparency, accountability, fairness, and the broader implications of deploying AI in critical and public-facing systems.
10. **Practical Experience:** Internships, co-op placements, and applied research projects provide opportunities for students to gain hands-on experience and professional skills. These experiences are integral to preparing graduates for careers in the AI industry.

In terms of the appropriateness of the level of study, the program covers all mandatory topics expected of an Artificial Intelligence engineer. It also integrates sustainability, system design, and engineering practice into the core AI curriculum, ensuring graduates are equipped to develop efficient, responsible, and real-world AI solutions.

5.2 General and specific program objectives

The purpose of the proposed program is to train Artificial Intelligence engineers with high-value skills for a broad range of industrial, government, and non-profit sectors in Quebec and worldwide. Graduates will help close critical talent gaps and drive economic growth by designing, deploying, and maintaining intelligent systems that enhance productivity, innovation, and competitiveness across the digital and physical economy.

5.2.1. General Educational Objectives

- Apply technical knowledge in engineering, natural sciences, mathematics, and computer science to design and implement intelligent systems and generate innovative AI-based solutions to problems in industry and society, including the development and deployment of AI technologies across the digital economy.
- Analyze processes and systems through the lens of AI system performance, reliability, safety, and fairness in order to understand the technical, economic, and societal impacts of design decisions, and to prioritize professional ethics, accountability, and responsible AI practices in decision-making.
- Pursue advanced degrees or professional certifications leading to careers in academia, research and development, entrepreneurship, or professional practice in sectors such as healthcare, finance, transportation, and public services; or obtain licensure as a professional engineer.
- Demonstrate a commitment to lifelong learning by continuously acquiring new knowledge, developing new skills, and gaining proficiency in emerging AI methods, tools, and engineering practices.

5.2.2. Specific Program Outcomes

By the end of the program, students should be able to:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics and by using the appropriate engineering tools (Graduate Attributes: Knowledge base for engineering, Problem analysis, Use of engineering tools)
- Design sustainable solutions that meet specified needs with consideration of all stakeholder views, public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (Graduate Attributes: Problem analysis, Design, Professionalism, Impact of engineering on society and the environment, Ethics and equity, Economics and project management)
- Communicate complex engineering concepts or processes effectively in oral, written, and graphical forms with a range of audiences (Graduate Attributes: Communication skills)
- Contribute within a diverse team to complete an engineering design, while supporting a collaborative and inclusive environment, by generating ideas, setting design criteria, establishing project milestones and tasks, and performing lifecycle and economic analysis (Graduate Attributes: Design, Use of engineering tools)
- Design and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions (Graduate Attributes: Investigation, Design)
- Identify their own learning needs and update their skill sets to maintain competence and contribute to the advancement of knowledge (Graduate Attributes: Life-long learning)
- Manage the design process through iterative idea generation, design criteria selection, project milestone and task scheduling, and lifecycle and economic analyses (Graduate Attributes: Economics and project management)

6. REGULATORY FRAMEWORK

6.1 Admission Requirements and Processes

A summary of the admission requirements and processes at the GCS is given here; for further description of the admission requirements and processes for Concordia University please consult the following sections of the

Undergraduate Calendar (UC): general admissions in Section 13[18]; and GCS admissions in Section 71.10[19]. The UC is available online.

6.1.1. General Admission Requirements

All applications to Concordia University go through a single processing center. Quebec applicants must: 1) successfully complete a two-year pre-university program in a CEGEP and qualify for a Diploma of Collegial Studies (DEC) or the equivalent, 2) have completed a three-year professional program in a CEGEP, or 3) have obtained a French or International Baccalaureate. Graduates from secondary schools in Canadian provinces and territories outside Quebec are considered for admission to the Extended Credit Program (ECP), which requires students to take 30 credits in addition to the regular program requirements. Transfers from other universities are possible. Applicants from outside of Canada are eligible, with further information available in Section 19 of the UC[20]. At the time of application, students can identify whether they would like to be considered for the co-operative education program.

The language of instruction at Concordia University is English, while most assignments and examinations may be submitted in French. Students whose first language is not English must demonstrate language proficiency prior to admission through achieving the appropriate score on one of five standardized English tests (Test of English as a Foreign Language, etc.) if they do not satisfy any of the exemption criteria.

6.1.2. Gina Cody School of Engineering and Computer Science (GCS) Admission Requirements for BEng

For Quebec applicants, there is a required CEGEP course profile of Mathematics 201 (103 or 201-NYA and 203 or 201-NYB and 105 or 201-NYC), Physics 203 (101 or 203-NYA and 201 or 203-NYB), and Chemistry 202 (101 or 202-NYA). As mentioned above, out-of-province applicants are considered for the ECP program if they do not have sufficient pre-university education (e.g., International Baccalaureate). As mentioned in the previous section, students in the ECP program must take 30 additional credits. The required courses are listed in Section 71.20.2 of the Undergraduate Calendar. These courses consist of a foundation in mathematics (9 credits), physics (6 credits), and chemistry (3 credits), as well as some electives in natural science (6 credits), humanities and social sciences (6 credits). Mature entry admission requirements are available in Section 14 of the UC.

6.1.3. AI Engineering Admission Requirements

Specific grade requirements for the program will be determined after the Curriculum Committee (defined in Section 6.3.1 of this document) evaluates the applications received, but are expected to be relatively in line with the grade requirements of the BEng in Software Engineering[21], which are summarized below:

- Quebec CEGEP: 25 overall (R-score) and if taken, 26 in math, 25 in physics.
- High school: A- overall, A- in math, B+ in physics.
- Indigenous Bridging Program: First Nations, Inuit and Métis students who do not meet Concordia's conventional admission requirements may be eligible for admission through the Kaié:ri Nikawerà:ke Indigenous Bridging Program.
- International Baccalaureate: 33 overall, 5 HL or 6 SL math, 5 HL or SL physics.
- International Baccalaureate Career-related Programme (CP): 5.5/7 overall, 5 HL or 6 SL math, 5 HL or SL physics
- French Baccalaureate: 15 overall, 15 in math, 14 in science.
- British system of education (GCE):
    - A-levels: At least two A-level exams AB, B in math, B in physics; or
    - AS-levels: At least 4 AS-level exams with equivalent results; or
    - BTEC: Level 3 Diploma or Extended Diploma in a related subject area with equivalent results.
- University transfer (internal): 3.0 overall, 3.0 in math/physics, 2.3 in courses offered by GCS.
- University transfer (external): B+ overall, B+ in math, B+ in physics.

[18] https://www.concordia.ca/academics/undergraduate/calendar/current/section-13-admission-regulations.html
[19] https://www.concordia.ca/academics/undergraduate/calendar/current/section-71-gina-cody-school-of-engineering-and-computer-science/section-71-10-gina-cody-school-of-engineering-and-computer-science.html
[20] https://www.concordia.ca/academics/undergraduate/calendar/current/section-19-international-students.html
[21] https://www.concordia.ca/academics/undergraduate/software-engineering.html#requirements

6.2 Commitment and structure of the program

The program is 120 credits (36 courses) for full-time studies, with a duration of four years. Exceptions are the ECP described in the previous section, requiring 30 additional credits.

Mandatory credits (120 credits):

1. Engineering Core Courses: 10 courses (27.5 credits)
    a. Includes 1 General Education HSS Elective Course (3 credits)
2. AI Core Courses: 20 courses (70 credits)
3. 1 Engineering and Natural Science Course (3 credits)
4. Technical Elective Courses: 5 courses (19.5 credits)

The engineering and AI engineering core include courses which address:

- Science Knowledge: solid foundation in mathematics, physics, electrical and computer network systems.
- Professional Engineering Skills: communication, engineering practice, technology and society, and engineering economics
- AI Engineering Fundamentals: Mathematics for AI, Machine Learning and Deep Learning, software engineering and programming, computing systems and infrastructure, deployment, safety, and lifecycle.
- Experiential learning: courses incorporating practice in theory.

The technical elective courses allow students to concentrate in the following subject areas:

- AI Hardware and Intelligent Systems
- AI Software
- Cybersecurity for AI

Two optional activities, with no credit value, will supplement the proposed curriculum:

- **Internships through the Concordia Institute for Co-operative Education:** All students will have the opportunity to apply to be a member of the Institute and take part in their Undergraduate Co-op Program, Career Edge (C. Edge) Program, or Accelerated Career Experience (ACE) Program
- **Summer Internships:** Concordia research institutes (e.g., Concordia Security Research Centre) or industrial partners (e.g., Ericsson, Hydro-Québec) can provide research or industry internships. Some professors will also hire undergraduate interns via the Mitacs Accelerate program. NSERC Undergraduate Student Research Awards and Concordia Undergraduate Student Research Awards will also be offered to students who are interested in research focused internships.

6.3 Program oversight

6.3.1 Leadership and composition of the Program Committee

Section 7.1.3 mentions the accreditation procedures for engineering programs in Canada. According to CEAB's *Accreditation Criteria and Procedures,*[22] program curriculum changes must be overseen by a formally structured curriculum committee and the majority of the voting members of the committee are expected to be licensed to practice engineering in Canada.

For the proposed program, the Curriculum Committee will be led by an Undergraduate Program Director and consist of 6 members, two faculty representatives from each participating department (CIISE, CSSE, and ECE), a student representative and a part-time faculty representative. The Curriculum Committee will be responsible for academic oversight of the AI program structure and content; reviewing and recommending curriculum changes, new course proposals, and program revisions; ensuring coherence, academic rigor, and alignment with accreditation standards; monitoring course sequencing, prerequisites, and learning outcomes; coordinating and consulting on curriculum changes with the relevant departments; and overseeing the continuous improvement process.

[22] https://engineerscanada.ca/accreditation/accreditation-resources/2026-2027-accreditation-cycle

6.3.2 Study Regulations

Students enrolled in the proposed program will be subject to the Academic Regulations defined by the university (Section 16 of the UC) and by the GCS (Section 71.10.4 of the UC), both available online.

6.3.3 Collaborative Arrangements with other Units, Departments, Faculties, and Institutions

The **Concordia Institute for Information Systems Engineering (CIISE)** is actively engaged with other departments, faculties, and research centers within the institution. All these established relationships will contribute to the vitality of the BEng. CIISE professors regularly teach courses in the Departments of Electrical and Computer Engineering, Computer Science and Software Engineering at both undergraduate and graduate levels. For instance, Prof. Chadi Assi, Prof. Honghao Fu, Prof. Arash Mohammadi, Prof. Chun Wang, and Prof. Jun Yan teach offerings of COEN 231 Introduction to Discrete Mathematics. Prof. Glitho also teaches ENCS 691 in the Department of Computer Science and Software Engineering. Professor Amr Yousef and Mohammed Mannan also teach SOEN courses in the Department of Computer Science and Software Engineering. CIISE professors also teach service courses, valuable to the faculty as a whole. These include ENCS courses taught by Prof. Walter Lucia and Prof. Mohsen Ghafouri. We expect that our faculty members will continue to teach undergraduate level courses in other departments.

Professor Mourad Debbabi is the director of the Security Research Centre, a multi-disciplinary center with 18 full members from six departments with diverse interests. The research center facilitates the interaction of security related researchers across departments, which will also provide critical resources in terms of teaching staff, research facilities, laboratories, and collaborations with industry partners.

CIISE is also developing a new inter-department MEng in Cyber-Physical and Critical Infrastructure Systems & Security with the Department of Electrical and Computer Engineering. Once approved, this program will provide the graduates of the BEng in cybersecurity with the option of continuing their studies at master's level.

Shared supervision of graduate students commonly occurs with the Department of Computer Science and Software Engineering (CSSE) and the Department of Electrical and Computer Engineering (ECE). CIISE professors also independently supervise students in other departments, including the above-mentioned departments, the Department of Building, Civil, and Environmental Engineering (BCEE), and Mechanical and Industrial Engineering.

The **Department of Electrical and Computer Engineering (ECE)** offers three distinct undergraduate programs: the BEng in Electrical Engineering, the BEng in Computer Engineering, and the BEng in Aerospace Engineering Option C-Avionics and Aerospace Systems. Together, these programs provide students with a strong foundation in the technologies that power modern society, from intelligent computing systems and advanced electronics to energy systems and aerospace applications.

The Computer Engineering program lies at the heart of the information revolution and its continuing transformation of society. It prepares students to design and develop the hardware and software systems that support today's digital world. Areas of specialization include computer programming, computer architecture, software systems engineering, embedded systems, digital electronics, digital circuits, very-large-scale integrated (VLSI) circuit design, layout and testing, digital circuit testing and reliability, digital communications, and computer networks. The program also includes elective groups in Software and System Design as well as Computer Science and Programming, featuring courses offered by the Department of Computer Science and Software Engineering. In addition, students may choose electives in Biological and Biomedical Engineering, including courses offered jointly with the Department of Biology in the Faculty of Arts and Science. Many Computer Engineering courses are also taught by faculty affiliated with the Concordia Institute for Information Systems Engineering (CIISE), further enriching the interdisciplinary nature of the program.

The Electrical Engineering program focuses on the generation, conversion, transmission, and intelligent use of energy and information in the most efficient and reliable ways. The field covers a broad range of topics, including electronics, integrated circuit and VLSI design, circuit layout and testing, control systems, robotics, telecommunications, signal processing, power and control systems, electromagnetics, antennas, and optoelectronics. Students in Electrical

Engineering may take elective courses offered through L'Institut en génie de l'énergie électrique, a consortium established in 2001 through a joint initiative of Hydro-Québec and founding industrial and university partners to support specialized training in electric energy engineering. Its original industrial partners included Hydro-Québec, ABB, ALSTOM, Dessau-Soprin, Siemens, SNC-Lavalin, and the AIEQ, while its university partners included Polytechnique Montréal, École de téchnologie supérieure, Concordia University, Université Laval, McGill University, and Université de Sherbrooke. Moreover, similar to Computer Engineering, students in the Electrical Engineering program may choose electives in Biological and Biomedical Engineering, including courses offered jointly with the Department of Biology in the Faculty of Arts and Science.

The BEng in Aerospace Engineering is offered jointly with the Department of Mechanical, Industrial and Aerospace Engineering. This program is concerned with the engineering science that governs the design, construction, and operation of aircraft and spacecraft. Aerospace systems rely heavily on electrical and computer engineering, particularly in areas such as avionics, navigation systems, communication networks, and flight control systems. The Aerospace Engineering Option C – Avionics and Aerospace Systems include core courses drawn from both the Computer Engineering and Electrical Engineering programs. In addition, many Aerospace courses are available to students in both the Electrical Engineering and Computer Engineering programs through elective offerings in Controls, Robotics, and Avionics, highlighting the close integration of these disciplines.

The **Department of Computer Science and Software Engineering (CSSE)** offers a suite of collaborative academic programs designed to bridge computing with complementary disciplines and broaden students' intellectual and professional horizons. Through three Joint Major programs -- Computer Science in Health and Life Sciences, Computation Arts and Computer Science, and Data Science -- students gain interdisciplinary expertise by engaging with partner departments and faculties across the university. These programs blend a strong foundation in computer science with specialized knowledge in biology and the life sciences, fine arts, or mathematics, depending on the chosen path, and each program resides jointly within CSSE and its collaborating department/faculty. In addition, CSSE offers a Minor in Computer Science, enabling students from other fields to develop essential computational skills that enhance their primary area of study and expand their career opportunities. Together, these offerings reflect CSSE's commitment to interdisciplinary education and to preparing graduates to innovate, collaborate, and excel in diverse domains.

Computer Science in Health and Life Sciences: The Bachelor of/Baccalaureate in Computer Science in Health and Life Sciences is offered in collaboration with the Department of Biology in the Faculty of Arts and Science. This program resides in both Faculties. In the Gina Cody School of Engineering and Computer Science, it is offered under the aegis of the Bachelor of/Baccalaureate in Computer Science (BCompSc). The BCompSc in Health and Life Sciences provides students with the unique mix of interdisciplinary knowledge and skills needed to work at the boundary of computing and health and life sciences. Research and development in this field often spans biochemistry and biology as well as computing and engineering. It is essential that students gain sufficient knowledge of the theory, application and language of all the relevant fields to be able to work in interdisciplinary teams to investigate scientific and technical questions, solve problems, use and develop tools and techniques, and communicate effectively. Drawing from students with different backgrounds but with aptitudes for both biology and computing, this interdisciplinary program focuses on scholarship that extends beyond traditional boundaries and prepares the graduates to work in the diverse fields of health and life sciences.

Computation Arts and Computer Science: The Bachelor of/Baccalaureate in Computation Arts and Computer Science is offered in collaboration with the Faculty of Fine Arts and Science. It provides a comprehensive education in computer science and a complementary set of courses of equivalent value in the fine arts. This program resides in both Faculties. In CSSE, it is offered under the aegis of the Bachelor of/Baccalaureate in Computer Science (BCompSc). According to their preferences and aspirations, students may apply either for a Bachelor of/Baccalaureate in Computer Science program, or a Bachelor of/Baccalaureate in Fine Arts program.

Data Science: The Bachelor of/Baccalaureate in Data Science is a program of study which combines a comprehensive education in computer science and mathematics. This program resides in both the Gina Cody School of Engineering and Computer Science and the Faculty of Arts and Science. In the Gina Cody School of Engineering and Computer Science, it

is offered under the aegis of the Bachelor of/Baccalaureate in Computer Science (BCompSc). According to their preferences and aspirations, students may apply either for a Bachelor of/Baccalaureate in Computer Science program, Bachelor of/Baccalaureate in Science program, or Bachelor of/Baccalaureate in Arts program.

Minor in Computer Science. The Minor in Computer Science is designed to meet the growing demand for computer-literate professionals and may offer students more career opportunities after graduation. This minor must be combined with a major, specialization or honours program outside of the Gina Cody School of Engineering and Computer Science.

7. PROGRAM STRUCTURE

7.1 Activities

7.1.1. Mandatory and Optional Courses

The proposed degree is a full-time program that consists of 36 courses, corresponding to 120 credits in total, which are allocated to four groups of courses:

- Engineering Core courses: 27.5 credits (10 courses)
- AI Core courses: 70 credits (20 courses)
- AI Electives: 19.5 credits (5 courses)
- Engineering and Natural Science Group elective: 3 credits (1 course)

Table 7.1 provides a detailed list of the Engineering Core courses and Table 7.2 provides a list of AI Core courses. Table 7.3 provides a list of available AI Elective courses and Table 7.4 provides a list of Engineering and Natural Science Group electives. Courses with the AI subject code are either existing courses or new courses, indicated in the table. Detailed course syllabi are provided in Appendix 2.

Table 7.1 Engineering Core (27.5 credits, 10 courses)

Courses	Credits	New / Existing
ELEC 275 Principles of Electrical Engineering	3.5	Existing
ENCS 282 Technical Writing and Communication	3	Existing
ENGR 201 Professional Practice and Responsibility	1.5	Existing
ENGR 202 Sustainable Development and Environmental Stewardship	1.5	Existing
ENGR 213 Applied Ordinary Differential Equations	3	Existing
ENGR 233 Applied Advanced Calculus	3	Existing
ENGR 301 Engineering Management Principles and Economics	3	Existing
ENGR 371 Probability and Statistics in Engineering	3	Existing
AI 392 AI and Society	3	New
General Education HSS Elective	3	n/a

Table 7.2 AI Core courses (70 credits, 20 courses)

Course	Credits	New / Existing
AI 228 System Hardware	4	Existing
AI 231 Discrete Mathematics	3	Existing
AI 243 Programming Methodology	3.5	Existing
AI 249 Object-Oriented Programming	3.5	Existing
AI 290 Introductory AI Engineering Team Design Project	3	New
AI 300 Mathematics for AI	3	New
AI 330 Applied Machine Learning	3	Existing
AI 333 Big Data Analytics	4	Existing

AI 334 Deep Learning	4	Existing
AI 335 Reinforcement Learning	4	New
AI 340 Generative AI	4	New
AI 345 Agentic AI	3	New
AI 346 Operating Systems	4	Existing
AI 350 Computer Architecture for AI	3	New
AI 352 Data Structures and Algorithms	3	Existing
AI 370 AI System Design	3	New
AI 380 Trustworthy and Safe AI	3	New
AI 390 AI Engineering Design Project	3	New
AI 487 AI and Machine Learning in Cybersecurity	3	New
AI 490 Capstone AI Engineering Design Project	6	New

Table 7.3 AI Elective Courses (19.5 credits, 5 courses)

Courses	**Credits**	**New / Existing**
AI Hardware and Intelligent Systems		
AI 401 Edge AI	4	New
AI 411 AI Hardware Accelerators	4	New
AI 412 AI for Wearable Health Applications	4	New
AI 421 Cloud Vector Database Systems for AI	4	New
AI 424 Optimization for Machine Learning	4	New
AI 441 Machine Learning Operations (MLOps)	4	New
AI 442 Explainable AI Engineering Process and Validation	4	New
AI 443 Embodied AI	4	New
AI Software		
AI 434 Distributed Learning	4	Existing
AI 436 Deep Learning for Computational Pathology	4	Existing
AI 449 Machine Learning Theory	4	Existing
AI 459 AI for Media and Content Delivery Networks	4	Existing
AI 469 Conversational Artificial Intelligence	4	Existing
AI 470 Engineering AI-Based Software Systems	4	New
AI 472 Generative AI for Software Engineering	4	Existing
AI 474 AI-Driven Software Improvement and Repair	4	Existing
Cybersecurity for AI		
AI 415 Hardware Security for AI Systems	4	Existing
AI 425 Resilient AI in Safety-Critical Applications	4	New
General / Other Electives		
AI 431 Cloud AI / Distributed ML	4	New
AI 432 Robot Learning	4	New
AI 454 Quantum Machine Learning	4	New

Table 7.4 Engineering and Natural Science Group (3 credits)

Courses	**Credits**	**New / Existing**
ENGR 245 Mechanical Analysis	3	Existing
MIAE 221 Materials Science	3	Existing

7.1.2. Description of Activities and Evaluation Methods

- **Coursework:** The courses favour a blended learning format and include, whenever possible, in-class work and discussions solving practical problems, and teamwork (projects & presentations). Experts from the industry may be invited to present specific topics.
- **Laboratories:** Our AI laboratory component is a critical aspect of the program, providing students with hands-on experience in the development and deployment of artificial intelligence systems. Through the use of modern AI frameworks and computing platforms, students will engage in laboratory exercises and practical projects that reflect real-world AI applications. The laboratories will reinforce key concepts covered in the core courses and emphasize the practical implementation of machine learning and AI techniques. Students will develop essential skills in areas such as data processing and analysis, machine learning model development, deep learning frameworks, AI system integration, model evaluation and optimization, and deployment on modern computing platforms including GPUs and cloud infrastructures. This practical experience will prepare students to design, implement, and evaluate AI solutions in a variety of application domains. Upon graduation, students will be well equipped to enter the workforce and contribute to the development of innovative and responsible AI technologies.
- **Capstone Project:** One (1) two-semester capstone design project course will provide students the opportunity to work with industrial partners, other departments, or research organizations to solve a real problem. In addition, courses will favour projects rather than assignments to put into practice the concepts learned and promote teamwork.
- **Special activities:** During the summer, students can engage in special activities to earn industry certification, gain work experience, or work in research in one of Concordia's research centres.

For more information about the course evaluation methods, please refer to the course outlines in Appendix 2.

7.1.3. Accreditation Activities

After the first class of students graduating from the BEng program, this program will be eligible for accreditation by Engineers Canada. The first accreditation visit may be scheduled in the final year of the first graduating class. Currently, accreditation visits are conducted following the 2025 *Accreditation Criteria and Procedures*. Part of the accreditation process involves the assessment of the Graduate Attributes, which were introduced in section 3.1 of this document. Another important part is the assessment of the curriculum content and quality, measured by Accreditation Units (AUs). AUs are defined on an hourly basis depending on the learning activity (1 AU for lecture hour, 0.5 AU for laboratory or tutorial hour, for 50 minutes of total activity). The minimum curriculum components for an engineering program are given in Table 7.5, along with the AUs in the provided program (assuming the students come in with the listed AUs from CEGEP).

Table 7.5. AU required by the 2025 *Accreditation Criteria and Procedures* and summary of total AU for the proposed BEng in AI Engineering

	Math	**Natural Science**	**Math + Natural Science**	**Comple-mentary Studies**	**Engineering Science**	**Engineering Design**	**Eng. Science + Eng. Design**	**Total**
Program AU	220.7	8.3	229.1	194.7	639.7	268.5	1105.0	1554.0
AU from CEGEP	108	180	288	72	0	0	0	360
Total program AU	328.7	213.5	542.3	266.7	639.7	268.5	1105.0	1914.0
AU minimum	195	195	420	225	225	225*	900**	1850

*225 AU must be delivered by faculty members holding professional licensure as specified in the Interpretive statement on licensure expectations and requirements.

**600 AU must be delivered by faculty members holding, or progressing toward, professional licensure as specified in the Interpretive statement on licensure expectations and requirements.

7.2 Pedagogical approaches

7.2.1. Combined theoretical and practical training

All the courses in the degree program will have in-person lectures discussing the relevant theory. In these lectures, the theoretical principles underlying the core AI engineering concepts will be discussed in detail. The application of these principles will be demonstrated through problem-solving. Problem-solving skills will be further developed by problem-set assignments.

To bridge the gap between theory and practice, many of the core courses in the degree program will have a project component in which students will apply their theoretical knowledge to solve industrially relevant problems. These projects will be carried out in teams to foster teamwork and collaboration, and to enhance the communication and leadership skills of the students. Students will be responsible for identifying a critical need/problem in the industry or a societal need in applicable courses. They will conduct appropriate experimentation/analysis and draw conclusions using their engineering judgment. Students will present and discuss their findings and participate in evaluating the work of other teams.

7.2.2. Hands-on laboratory training

Hands-on laboratory training is a key component of our BEng AI program, providing students with practical experience in applying theoretical concepts to real-world AI engineering/applications scenarios. Our laboratory sessions are designed to reinforce key concepts covered in the core courses and will emphasize problem-solving and achieving specific objectives. Students will have access to advanced equipment and tools, including high-performance GPU-based clusters “Speed” and Viryia” using remote connections. We will incorporate emerging AI technologies and trends into our lab sessions to ensure that our students are up to date with the latest advancements in AI engineering and systems design and deployment.

Our hands-on laboratory training is led by not only specialized AI faculty members but also experienced professionals who bring industry expertise and real-world experience to the classroom. This practical experience will be invaluable in preparing students for the dynamic and ever-changing field of AI. Upon graduation, students will have the practical skills and knowledge necessary to enter the workforce and contribute to the development and deployment of cutting-edge AI-enabled systems.

7.2.3. Innovation in Teaching and Learning

Innovation in teaching and learning is crucial for our BEng in AI program, given the rapidly changing landscape of AI technologies. We are committed to providing our students with cutting-edge education that prepares them to address the latest AI challenges. To achieve this goal, we have implemented various innovative teaching and learning strategies such as project-based learning and flipped classrooms. These strategies are designed to engage students actively, promote critical thinking, and enhance problem-solving skills. Our program also utilizes online resources, open educational resources, and multimedia tools to enhance student learning and accessibility. Additionally, we provide students with opportunities to participate in AI software development competitions, hackathons, and internships to apply their skills and knowledge to real-world scenarios. By utilizing innovative teaching and learning strategies, we aim to produce AI professionals who are well-equipped to address the ever-changing AI landscape.

7.2.4. Pedagogical approaches in capstone course

The capstone course is a design-focused and project-based course students will take in the last two terms of the degree program. The course learning outcomes, learning activities, evaluation methods and deliverables have been designed to allow students to further develop and demonstrate achievement (at the application level) of all 12 graduate attributes.

The capstone project requires students to work in groups to define a design problem, conduct research, design, and plan the implementation and deployment of AI-enabled solutions. Similar to other BEng Capstone design projects at the Gina Cody School, the pedagogical methods used for this course draw on problem-based learning, collaborative learning, and reflective learning. Students will be evaluated with a midterm report, a progress poster, a final report and a final presentation. These deliverables, along with transparent evaluation criteria/rubrics, aim to enhance students’ ability to

solve open-ended design problems, improve teamwork skills, communicate processes and solutions in written, oral and visual forms, and identify needs for further learning. Further information can be found in the course outline for AI 490 Capstone AI Engineering Design Project in Appendix 2.

7.2.5. Work-Integrated learning

Concordia University offers a variety of structured work-integrated learning programs through the Institute for Co-operative Education. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. Among the different modalities offered, the Co-op program is the longest-standing and the most popular. Students admitted to the Co-op program will alternate between study terms and three internships with three different employers. The program integrates academic studies with program-relevant work experiences in a progressive manner, giving students the opportunity to transfer knowledge and skills between work and classroom settings.

Students can apply to Co-op by completing the appropriate section on the University Admission form. Admission to the program is based on academic performance and a few other factors. Students can also apply to Co-op after being enrolled in the program as long as they have a minimum of 90 credits remaining. All eight existing BEng programs at Concordia offer Co-op options.

Capitalizing on other programs' experience in incorporating work-integrated learning in the curriculum, the proposed BSc in AI will also open the Co-op and the C-Edge programs to its students. Both programs will be optional upon the launch of the new program, but a clear pathway and ample support will be provided to students enrolled in those programs. There is a possibility of making C-Edge (one internship) mandatory a few years down the road when enrollments are steady and connections with employers are well established.

<u>Other Experiential Learning (EL) Opportunities</u>

Like students enrolled in any other program at Concordia University, students in the proposed new program will benefit from the following experiential learning and professional development offerings provided by the university to expand their hands-on and professional learning opportunities.

Concordia offers six types of experiential learning opportunities: course-integrated, work-integrated, research-based, community-based, international, and student life. Students can search for EL opportunities to participate in by faculty, program, or by type. Career counselors are available to help students explore how different experiential learning opportunities complement different career pathways or their particular career goals. In addition, a personal EL roadmap tool is available to all students, which helps students plan to integrate experiential learning activities into their studies throughout the program.

Concordia has also partnered with Riipen, the world's leading virtual project-based learning platform that connects students with industry and community partners to complete real-world projects for academic credit. Faculty can use Riipen to find real-world projects to use as course assignments and track student progress in real time.

<u>Free professional development courses</u>

Concordia provides students as well as faculty and staff access to more than 4000 free online courses from Udemy covering virtually all disciplines. AI Engineering students can find courses that help them solidify prerequisite knowledge, enhance their current studies within the curriculum, and build professional skills as AI engineers.

7.3 Typical student path

The proposed degree is a full-time, 4-year program with an optional co-op stream. Table 7.6 below shows a sample program pathway for students enrolled in the co-op program with a September entry.

Table 7.6 Study/Work Sequence for the Co-op Program (September Entry)

Year	Fall	Winter	Summer
1	Study	Study	Study
2	Work Term 1	Study	Work Term 2
3	Study	Work Term 3	Study

The core courses in AI will be offered in multiple semesters (Fall, Winter, Summer) as needed to accommodate the needs of students in both the regular and the co-op programs. For a detailed mapping of all courses to academic semesters for regular and co-op and students, see the pathways and course sequences provided in the following pages for September Entry - Regular, and September Entry - Co-op.

Proportion of practical versus theoretical activities

The proportion of practical versus theoretical activities is 45% practical versus 55% theoretical. The practical activities correspond to the tutorial and laboratory hours. There is a large proportion of practical activities compared to theoretical activities, showing that the program has a strong experiential learning component. Note that this does not include the optional experiential learning opportunities such as the Co-op program, E-Edge, or ACE.

Table 7.7 Typical Course Sequence (Fall Term Entry)

Year 1: Fall term		**credits**	**prerequisites / co-requisites**
AI 243	Programming Methodology	3.5	P: MATH 204
ELEC 275	Principles of Electrical Engineering	3.5	P: PHYS 205 | C: ENGR 213
ENCS 282	Technical Writing and Communication	3.0	P: EWT or ENCS 272
ENGR 201	Professional Practice and Responsibility	1.5	
ENGR 213	Applied Ordinary Differential Equations	3.0	P: MATH 204, MATH 205
	term total	**14.5**	
Year 1: Winter term		**credits**	**prerequisites / co-requisites**
AI 228	System Hardware	4.0	P: MATH 203 and 204
AI 231	Discrete Mathematics	3.0	P: MATH 204
AI 249	Object-Oriented Programming	3.5	P: AI 243; MATH 203 | C: MATH 205
ENGR 202	Sustainable Development and Environmental Stewardship	1.5	
ENGR 233	Applied Advanced Calculus	3.0	P: MATH 204, MATH 205
	term total	**15.0**	
Year 2: Fall term		**credits**	**prerequisites / co-requisites**
AI 290	Introductory AI Engineering Team Design Project	3.0	P: AI 249
AI 352	Data Structures and Algorithms	3.0	P: AI 231, AI 249
AI 392	AI and Society	3.0	P: ENCS 282
ENGR 371	Probability and Statistics in Engineering	3.0	P: ENGR 213, ENGR 233
GenEd	General Education HSS Elective	3.0	
	term total	**15.0**	
Year 2: Winter term		**credits**	**prerequisites / co-requisites**
AI 300	Mathematics for AI	3.0	P: AI 231, AI 249
AI 330	Applied Machine Learning	3.0	P: AI 249; ENGR 371
AI 333	Big Data Analytics	4.0	P: AI 352

AI 346	Operating Systems	4.0	P: AI 228; AI 352
	term total	**14.0**	
Year 3: Fall term		**credits**	**prerequisites / co-requisites**
AI 334	Deep Learning	4.0	P: AI 330
AI 350	Computer Architecture for AI	3.0	P: AI 228, AI 300, AI 330
AI 390	AI Engineering Design Project	3.0	P: AI 290
ENGR 301	Engineering Management Principles and Economics	3.0	
NS ELEC	Engineering and Natural Science Elective	3.0	
	term total	**16.0**	
Year 3: Winter term		**credits**	**prerequisites / co-requisites**
AI 335	Reinforcement Learning	4.0	P: AI 330, AI 334
AI 340	Generative AI	4.0	P: AI 334
AI 370	AI System Design	3.0	P: AI 330, AI 334
AI 380	Trustworthy and Safe AI	3.0	P: AI 330 | C: AI 370
	term total	**14.0**	
Year 4: Fall term		**credits**	**prerequisites / co-requisites**
AI 345	Agentic AI	3.0	P: AI 340
AI 487	AI and Machine Learning in Cybersecurity	3.0	P: AI 300
AI 490	Capstone AI Engineering Design Project (1st term)	3.0	AI 390; 75 program credits
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
	term total	**17.0**	
Year 4: Winter term		**credits**	**prerequisites / co-requisites**
AI 490	Capstone AI Engineering Design Project (2nd term)	3.0	AI 390; 75 program credits
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
	term total	**15.0**	

Table 7.8 Typical Course Sequence – Co-op (Fall Term Entry)

Year 1: Fall term		**credits**	**prerequisites / co-requisites**
AI 243	Programming Methodology	3.5	P: MATH 204
ELEC 275	Principles of Electrical Engineering	3.5	P: PHYS 205 | C: ENGR 213
ENCS 282	Technical Writing and Communication	3.0	P: EWT or ENCS 272
ENGR 201	Professional Practice and Responsibility	1.5	
ENGR 213	Applied Ordinary Differential Equations	3.0	P: MATH 204, MATH 205
	term total	**14.5**	
Year 1: Winter term			
AI 228	System Hardware	4.0	P: MATH 203 and 204
AI 231	Discrete Mathematics	3.0	P: MATH 204
AI 249	Object-Oriented Programming	3.5	P: AI 243; MATH 203 | C: MATH 205
ENGR 202	Sustainable Development and Environmental Stewardship	1.5	
ENGR 233	Applied Advanced Calculus	3.0	P: MATH 204, MATH 205
	term total	**15.0**	
Year 1: Summer term			
AI 352	Data Structures and Algorithms	3.0	P: AI 231, AI 249
ENGR 301	Engineering Management Principles and Economics	3.0	
ENGR 371	Probability and Statistics in Engineering	3.0	P: ENGR 213, ENGR 233
GenEd	General Education HSS Elective	3.0	

NS ELEC	Engineering and Natural Science Elective	3.0	
	term total	**15.0**	
Year 2: Fall term - Work term			
WORK TERM 1			
Year 2: Winter term			
AI 290	Introductory AI Engineering Team Design Project	3.0	P: AI 249
AI 300	Mathematics for AI	3.0	P: AI 231, AI 249
AI 330	Applied Machine Learning	3.0	P: AI 249; ENGR 371
AI 333	Big Data Analytics	4.0	P: AI 352
AI 346	Operating Systems	4.0	P: AI 228; AI 352
	term total	**17.0**	
Year 2: Summer term - Work term			
WORK TERM 2			
Year 3: Fall term			
AI 334	Deep Learning	4.0	P: AI 330
AI 350	Computer Architecture for AI	3.0	P: AI 228, AI 300, AI 330
AI 390	AI Engineering Design Project	3.0	P: AI 290
AI 392	AI and Society	3.0	P: ENCS 282
	term total	**13.0**	
Year 3: Winter term		**credits**	**prerequisites / co-requisites**
AI 335	Reinforcement Learning	4.0	P: AI 330, AI 334
AI 340	Generative AI	4.0	P: AI 334
AI 370	AI System Design	3.0	P: AI 330, AI 334
AI 380	Trustworthy and Safe AI	3.0	P: AI 330 | C: AI 370
	term total	**14.0**	
Year 3: Summer term: Work Term			
WORK TERM 3			
Year 4: Fall term			
AI 345	Agentic AI	3.0	P: AI 340
AI 487	AI and Machine Learning in Cybersecurity	3.0	P: AI 300
AI 490	Capstone AI Engineering Design Project (1st term)	3.0	AI 390; 75 program credits
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
	term total	**17.0**	
Year 4: Winter term			
AI 490	Capstone AI Engineering Design Project (2nd term)	3.0	AI 390; 75 program credits
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
	term total	**15.0**	

7.4 Feedback and evaluation

A description of the feedback and evaluation of the co-operative education program is given in Section 7.4.1. There is no research component of the program.

7.4.1. Feedback and Evaluation Processes for the Co-operative Format

The Institute for Co-operative Education offers a number of work-integrated learning opportunities to students in the GCS. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. It provides students with the opportunity to combine study with paid work terms in their chosen fields.

The academic content is identical to that of the regular programs with three work terms interspersed with study terms. However, in order to continue their studies in the co-operative format in the GCS, or to graduate from one of its programs as members of the Institute for Co-operative Education, students must satisfy the following conditions:

i. must be in acceptable standing and maintain a cumulative grade point average (CGPA) of at least 2.50 in their program (the CGPA is calculated in the manner described in Section 16.3.10 Academic Performance under Section 16.3 Evaluation, Administrative Notations, Examinations, and Performance Requirements);
ii. be assigned a grade of pass for each of the three work-term courses (CWTE or CWTC). Under certain conditions, students may be placed on co-op probation status;
iii. remain in their designated work study sequence. Any deviations must have prior approval by the director of the Institute for Co-operative Education in consultation with the co-op program director in their department.

Regulations for Work Terms

- Successful completion of the work terms shown in the Co-op Schedule indicated in Section 24 Institute for Co-operative Education is a prerequisite for graduation as a member of the Institute for Co-operative Education.
- Work-term job descriptions are screened by the co-op coordinator. Only jobs approved by the Institute for Co-operative Education will be accepted as being suitable for the work-term requirements.
- Work-term jobs are full-time employment normally for a minimum of 12 consecutive weeks (14 to 16 weeks, preferably).
- A work-term report must be submitted each work term on a subject related to the student's employment. This report must be submitted to the Institute for Co-operative Education on or before the deadline shown in Section 24 Institute for Co-operative Education. Grammar and content of work-term reports are evaluated by the Institute for Co-operative Education and the technical aspects are evaluated by the co-op program director responsible. Evidence of the student's ability to gather material relating to the job, analyze it effectively, and present it in a clear, logical, and concise form is required in the report.
- The required communication component consists of an oral presentation on a technical subject or engineering task taken from the student's work environment. The presentation will be given on campus in a formal setting after students have returned to their study term. A written summary is also required. Guidelines for the preparation of this oral presentation are provided in the Co-op Student Handbook.
- Work terms will be evaluated for satisfactory completion. Assessment is based upon the employer evaluation of performance, the work-term report, graded by the Academic Director, and communication component which together constitute the job performance as related to the whole work term. Students must pass all required components. The grade of pass or fail will be assigned to each of the work-term courses. A failing grade will result in the student's withdrawal from the Institute for Co-operative Education.

Student Demand and Enrolment

All students will be able to apply for the Co-op program. Those who are not admitted to the Co-op program can enroll in the Career Edge program. Every student who wishes to have an internship will have the opportunity to enroll in the Career Edge program.

7.5 Alignment of activities, skills and program objectives

Engineering education in Canada is overseen by Engineers Canada. The necessary skills and attributes required of graduating students are well-documented to ensure that graduates are achieving the appropriate standard of education to start careers in their selected domains. To this end, 12 graduate attributes are defined that must be addressed by the proposed curriculum. Aligned with these attributes, the courses proposed for the undergraduate AI engineering program are linked to these attributes and the level at which the attribute is learned or demonstrated (introduce, develop, apply) in a particular course.

Table 7.9: Curriculum mapping showing alignment of graduate attributes, indicators, and courses

Graduate attribute:	1. A knowledge base for engineering		
Definition:	Demonstrated competence in university-level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
KB-1. Knowledge base of mathematics	Introductory	Identify appropriate techniques for solving mathematical problems	ENGR 213 Applied Ordinary Differential Equations ENGR 233 Applied Advanced Calculus ENGR 371 Probability and Statistics for Engineering
	Developed / Intermediate	Apply knowledge to systems problems	AI 231 Discrete Mathematics AI 300 Mathematics for AI ENGR 245 Mechanical Analysis
	Applied / Advanced	Adapt math knowledge to engineering problems; Evaluate and validate results; Show in-depth understanding of university-level mathematics	AI 333 Big Data Analytics ENGR 371 Probability and Statistics for Engineering
KB-2. Knowledge base of natural science	Introductory	Remember solution techniques; Identify appropriate techniques for solving natural science problems	ENGR 245 Mechanical Analysis (Eng and Nat Sci elective) MIAE 221 Materials Science (Eng and Nat Sci elective)
	Developed / Intermediate	Apply techniques to natural science systems problems	ELEC 275 Principles of Electrical Engineering ENGR 233 Applied Advanced Calculus
	Applied / Advanced	Use acquired knowledge to solve engineering problems; Evaluate and validate results; Show in-depth understanding of university-level natural science	AI 380 Trustworthy and Safe AI AI 487 AI and Machine Learning in Cybersecurity
KB-3. Knowledge base in a specific domain	Introductory	Remember solution techniques; Identify appropriate technique for tackling engineering problems	AI 228 System Hardware AI 243 Programming Methodology ENGR 245 Mechanical Analysis MIAE 221 Materials Science
	Developed / Intermediate	Apply techniques to engineering systems problems	AI 231 Discrete Mathematics AI 249 Object-Oriented Programming AI 330 Applied Machine Learning AI 333 Big Data Analytics AI 334 Deep Learning AI 335 Reinforcement Learning AI 340 Generative AI AI 346 Operating Systems AI 352 Data Structures and Algorithms AI 390 AI Engineering Design Project AI 392 AI and Society
	Applied / Advanced	Combine multiple methods for tackling system problems; Evaluate and validate results; Show in-depth understanding of engineering knowledge in the field of study	AI 345 Agentic AI AI 350 Computer Architecture for AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity

Graduate attribute:	2. Problem analysis		
Definition:	An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
PA-1. Problem identification and formulation	Introductory	Explain/describe the problem; Explain given information and ideas; Identify missing information; Formulate by recalling similar example	AI 228 System Hardware AI 243 Programming Methodology ELEC 275 Principles of Electrical Engineering ENGR 213 Applied Ordinary Differential Equations
	Developed / Intermediate	Interpret unknowns and ambiguities; Draw connections among ideas; Examine all facts to produce new solutions; Generalize the formulations from examples already seen	AI 300 Mathematics for AI AI 330 Applied Machine Learning AI 334 Deep Learning AI 335 Reinforcement Learning AI 370 AI System Design AI 487 AI and ML in Cybersecurity AI 490 Capstone AI Engineering Design Project ENGR 233 Applied Advanced Calculus
	Applied / Advanced	Justify and defend solutions; Formulate / produce new solutions based on supporting evidence	AI 352 Data Structures and Algorithms AI 390 AI Engineering Design Project
PA-2. Modelling	Introductory	Identify parameters and variables from a problem statement; Recall existing models for the similar problems	AI 228 System Hardware AI 243 Programming Methodology AI 300 Mathematics for AI ELEC 275 Principles of Electrical Engineering ENGR 213 Applied Ordinary Differential Equations
	Developed / Intermediate	Compare modeling strategies: Logical-Mathematical models vs. Physical Models; Draw valid assumptions	AI 330 Applied Machine Learning AI 333 Big Data Analytics AI 335 Reinforcement Learning AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity ENGR 233 Applied Advanced Calculus
	Applied / Advanced	Weigh limitations, barriers and opportunities; Evaluate assumptions to formulate a prototype	AI 345 Agentic AI AI 352 Data Structures and Algorithms AI 490 Capstone AI Engineering Design Project
PA-3. Problem solving	Introductory	Identify methods to solve the problem; Select the right method to solve the problem	AI 228 System Hardware AI 243 Programming Methodology ELEC 275 Principles of Electrical Engineering ENGR 213 Applied Ordinary Differential Equations ENGR 245 Mechanical Analysis
	Developed / Intermediate	Interpret problem for a special case; Test solutions using computer programs and computer simulation; Solve problem by making educated guesses	AI 300 Mathematics for AI AI 330 Applied Machine Learning AI 335 Reinforcement Learning AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Evaluate the problem for general cases; Justify and verify solutions	AI 345 Agentic AI AI 352 Data Structures and Algorithms AI 380 Trustworthy and Safe AI AI 490 Capstone AI Engineering Design Project ENGR 233 Applied Advanced Calculus
PA-4. Analysis (uncertainty and incomplete knowledge)	Introductory	Identify elements of uncertainty; Identify patterns; Describe the knowledge acquired from the experience	AI 228 System Hardware AI 243 Programming Methodology ELEC 275 Principles of Electrical Engineering

	Developed / Intermediate	Relate a given problem to similar problems; Reorganize a problem by splitting it into sub-parts; Distinguish / Calculate range of expected inputs and outputs; Interpret results of analysis, degree of accuracy; Distinguish and choose between different alternatives	AI 330 Applied Machine Learning AI 333 Big Data Analytics AI 335 Reinforcement Learning AI 370 AI System Design AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Weigh a model to simplify it and remove unnecessary details; Develop / derive new facts; Evaluate and justify a chosen solution based on criteria	AI 350 Computer Architecture for AI AI 352 Data Structures and Algorithms AI 380 Trustworthy and Safe AI

Graduate attribute:	**3. Investigation**		
Definition:	An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
INV-1. Background and hypothesis formulation	Introductory	Describe the setting for the investigation; Why are we doing it?; What are we expecting?	ENGR 371 Probability and Statistics for Engineering
	Developed / Intermediate	Consider whether it has been done before and how it relates to theory/other information	AI 330 Applied Machine Learning AI 390 AI Engineering Design Project
	Applied / Advanced	Compare alternative engineering solutions	AI 490 Capstone AI Engineering Design Project
INV-2. Designing experiments	Introductory	Comprehend randomness; Choose instruments and testing method; Demonstrate understanding of concepts of reproducibility, accuracy, feasibility, cost, size	ENGR 371 Probability and Statistics for Engineering
	Developed / Intermediate	Avoid bias; Consider limitations of equipment; Discuss issue of materials vs. measurements; Discuss difficulty of duplication	AI 330 Applied Machine Learning AI 390 AI Engineering Design Project
	Applied / Advanced	Design a controlled experiment	AI 350 Computer Architecture for AI AI 490 Capstone AI Engineering Design Project
INV-3. Conducting experiments and collection of data	Introductory	Identify the available tools for conducting experiments and collecting data; Demonstrate the knowledge for using tools; Report all data objectively	ENGR 371 Probability and Statistics for Engineering
	Developed / Intermediate	Consider variability / operator error; Discuss random sampling; Debate safety issues; Discuss ethical issues including obtaining appropriate permissions if experiments involve humans	AI 330 Applied Machine Learning AI 370 AI System Design AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Develop strategies to analyze / capture the performance of engineering systems	AI 350 Computer Architecture for AI AI 490 Capstone AI Engineering Design Project
INV-4. Analysis and interpretation of data	Introductory	Aware of mathematical tools required for data analysis	ENGR 371 Probability and Statistics for Engineering
	Developed / Intermediate	Use methods from probability and statistics to analyze and interpret data; Match experimental results with theory; Synthesize information to arrive at substantiated conclusions	AI 330 Applied Machine Learning AI 390 AI Engineering Design Project
	Applied / Advanced	Validate assumptions; Discuss what went wrong / error analysis	AI 350 Computer Architecture for AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity AI 490 Capstone AI Engineering Design Project

Graduate attribute:	4. Design		
Definition:	The ability to perform engineering design. Engineering design is a process of making informed decisions to creatively devise products, systems, components, or processes to meet specified goals based on engineering analysis and judgement. The process is often characterized as complex, open-ended, iterative, and multidisciplinary. Solutions incorporate natural sciences, mathematics, and engineering science, using systematic and current best practices to satisfy defined objectives within identified requirements, criteria and constraints. Constraints to be considered may include (but are not limited to): health and safety, sustainability, environmental, ethical, security, economic, aesthetics and human factors, feasibility and compliance with regulatory aspects, along with universal design issues such as societal, cultural and diversification facets.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
DE-1. Define the objective	Introductory	Consult / discuss with client; Gather information; Describe the problem; Define client objectives	AI 228 System Hardware
	Developed / Intermediate	Analyze social and environmental needs; Examine prior solutions; Evaluate benchmark solutions available in the market	AI 290 Introductory AI Engineering Team Design Project AI 330 Applied Machine Learning AI 346 Operating Systems AI 390 AI Engineering Design Project
	Applied / Advanced	Evaluate future societal / corporation needs and technologies	AI 345 Agentic AI AI 490 Capstone AI Engineering Design Project
DE-2. Idea generation and selection	Introductory	Identify exiting solutions that would satisfy the requirements / expectations of the design; Identify the required technology to satisfy the needs of given design	AI 228 System Hardware AI 290 Introductory AI Engineering Team Design Project
	Developed / Intermediate	Define features / capabilities to be evaluated; Define conceptual alternatives; Discuss how each feature satisfies the client's needs	AI 330 Applied Machine Learning AI 334 Deep Learning AI 335 Reinforcement Learning AI 346 Operating Systems AI 390 AI Engineering Design Project
	Applied / Advanced	Critique alternative solutions; Create new, unique, untried solutions; Develop ideas outside the box; Weigh solutions using techniques such as brainstorming and lateral thinking; Select appropriate solutions using decision grids or force-field analysis	AI 345 Agentic AI AI 490 Capstone AI Engineering Design Project
DE-3. Detailed design	Introductory	Describe a complex solution that allows implementation	AI 228 System Hardware AI 249 Object-Oriented Programming AI 290 Introductory AI Engineering Team Design Project
	Developed / Intermediate	Relate and synthesize solutions to sub-problems; Demonstrate / show details; Adapt the best available solution for the given design challenge	AI 330 Applied Machine Learning AI 334 Deep Learning AI 370 AI System Design AI 390 AI Engineering Design Project
	Applied / Advanced	Validate/ substantiate solutions	AI 490 Capstone AI Engineering Design Project
DE-4. Validation and implementation	Introductory	Describe the required methodology / tools for validation; Select the right methodology for validation and implementation	AI 228 System Hardware AI 290 Introductory AI Engineering Team Design Project
	Developed / Intermediate	Question / check for accuracy	AI 249 Object-Oriented Programming AI 330 Applied Machine Learning AI 334 Deep Learning AI 346 Operating Systems AI 370 AI System Design AI 390 AI Engineering Design Project
	Applied / Advanced	Validate design against specs (does it meet all requirements, e.g., cost, efficiency, codes, etc.?); Weigh solution against multiple, objective criteria of evaluation; Defend the originality of the design	AI 345 Agentic AI AI 490 Capstone AI Engineering Design Project

Graduate attribute:	5. Use of engineering tools		
Definition:	An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
UET-1. Ability to use appropriate engineering tools, techniques and resources	Introductory	Describes the experiment	AI 228 System Hardware AI 290 Introductory AI Engineering Team Design Project AI 300 Mathematics for AI ELEC 275 Principles of Electrical Engineering
	Developed / Intermediate	Use library tools with accuracy and precision; Demonstrate the usage of tools in lab environment; Show competence in using various engineering software; Show competence in understanding of experiments	AI 249 Object-Oriented Programming AI 334 Deep Learning AI 335 Reinforcement Learning AI 340 Generative AI AI 370 AI System Design AI 390 AI Engineering Design Project
	Applied / Advanced	Improve the capabilities of tools	AI 345 Agentic AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity
UET-2. Ability to select appropriate tools, techniques, and resources	Introductory	Demonstrate knowledge of / awareness of standards	AI 290 Introductory AI Engineering Team Design Project AI 300 Mathematics for AI
	Developed / Intermediate	Compare the capabilities of different tools	AI 330 Applied Machine Learning AI 335 Reinforcement Learning AI 340 Generative AI AI 390 AI Engineering Design Project
	Applied / Advanced	Select appropriate technical documentation; Evaluate suitability of the tools for the task; In labs, choose the right tools / techniques for problem; In projects, demonstrate ability to select appropriate tools and techniques	AI 345 Agentic AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity AI 490 Capstone AI Engineering Design Project
UET-3. Demonstrate awareness of limitations of tools, create and extend tools as necessary	Introductory	Demonstrate awareness of limitations of tools	ELEC 275 Principles of Electrical Engineering Introductory courses with labs
	Developed / Intermediate	Address limitations of given tools by extending tools and combining tools	AI 335 Reinforcement Learning AI 340 Generative AI AI 390 AI Engineering Design Project
	Applied / Advanced	Address limitations of given tools by creating new tools; Weigh limitations of given tools by choosing different tools	AI 345 Agentic AI AI 350 Computer Architecture for AI AI 487 AI and ML in Cybersecurity AI 490 Capstone AI Engineering Design Project

Graduate attribute:	6. Individual and team work		
Definition:	An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
ITW-1. Cooperation and work ethics	Introductory	Understand the expectations of team members; Assist teammates when needed	AI 228 System Hardware ELEC 275 Principles of Electrical Engineering ENGR 213 Applied Ordinary Differential Equations ENGR 301 Engineering Management Principles and Economics
	Developed / Intermediate	Actively participating in meetings; Communicate within the team; Cooperate within the team; Demonstrate flexibility to adapt changing conditions	AI 290 Introductory AI Engineering Team Design Project AI 330 Applied Machine Learning AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity

	Applied / Advanced	Respect team-mates; Recognize teammates who need support; Provide feedback on team members' contributions; Volunteer for tasks	AI 490 Capstone AI Engineering Design Project
ITW-2. Contribution: practical/conceptual	Introductory	Identify the knowledge/skills required to make impact on team projects; Provide timely and quality feedback on the assigned tasks	AI 228 System Hardware ELEC 275 Principles of Electrical Engineering ENGR 301 Engineering Management Principles and Economics
	Developed / Intermediate	Recognize the need for research and gathering information; Recognize the accountability of an individual member for the submitted teamwork; Demonstrate technical and professional engineering skills throughout the team-work; Assess the quality of the work	AI 290 Introductory AI Engineering Team Design Project AI 330 Applied Machine Learning AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Suggest ideas; Write reports or section of reports; Provide constructive feedback on the report(s) or presentations; Contribute to the presentation	AI 490 Capstone AI Engineering Design Project
ITW-3. Initiative and leadership	Introductory	Recognize your own strengths that would make positive impact on the team	AI 228 System Hardware ELEC 275 Principles of Electrical Engineering
	Developed / Intermediate	Identify teammates' strengths that would make positive impact on the team	AI 290 Introductory AI Engineering Team Design Project AI 330 Applied Machine Learning AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Assess contribution as measured by peer-evaluation; Demonstrates leadership and initiative; Supports shared leadership; Judge the quality of the work delivered; Recognize unprofessional behaviors in teams and select the appropriate tools to intervene	AI 490 Capstone AI Engineering Design Project
ITW-4. Team dynamics	Introductory	Awareness of his/her role in the group; Recognize conflict in teamwork; Understand the importance of accountability and reliability in team dynamics	AI 228 System Hardware ELEC 275 Principles of Electrical Engineering
	Developed / Intermediate	Identify differences among group members that cause uncontrollable working environment; Suggest strategies to manage conflict	AI 290 Introductory AI Engineering Team Design Project AI 330 Applied Machine Learning AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Overcome conflict and ensure the continuity of work in teams in the future; Foresee future conflicts and avoid them in a professional manner	AI 490 Capstone AI Engineering Design Project

Graduate attribute:	**7. Communication skills**		
Definition:	An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
COM-1. Writing process	Introductory	Identify communicative purposes; Identify audience needs and level of knowledge; Identify task requirements through active listening	ENCS 282 Technical Writing and Communication ENGR 301 Engineering Management Principles and Economics

	Developed / Intermediate	Frame supportable, significant theses and arguments; Draft and revise for organization, clarity, and adherence to requirements	AI 290 Introductory AI Engineering Team Design Project AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Give and respond to critical feedback; Adapt content, form, and style to respond to different communicative situations	AI 490 Capstone AI Engineering Design Project
COM-2. Information gathering	Introductory	Identify document types; Maintain complete and accurate records of sources	ENCS 282 Technical Writing and Communication
	Developed / Intermediate	Formulate search strategies; Employ effective search techniques for electronic databases and library resources	AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Evaluate quality and usefulness of sources	AI 490 Capstone AI Engineering Design Project
COM-3. Documentation	Introductory	Select document type (genre) appropriate for communicative situation; Produce a complete written document with content that is clearly understood by the audience	
	Developed / Intermediate	Paraphrase and/or summarize information; Attribute source materials through proper in-text citation and referencing; Represent engineering concepts visually	AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity ENCS 282 Technical Writing and Communication
	Applied / Advanced	Synthesize and/or evaluate source materials; Produce documents that can be certified by professional engineers	AI 490 Capstone AI Engineering Design Project
COM-4. Oral presentation	Introductory	Identify audience needs, interests, and level of knowledge; Convey information orally within allocated timeframes; Select appropriate visual and audio media and tools to maintain audience attention	AI 290 Introductory AI Engineering Team Design Project ENCS 282 Technical Writing and Communication
	Developed / Intermediate	Establish appropriate scope for treatment of topic in oral presentation; Plan and incorporate visual materials; Utilize effective oral delivery techniques; Appreciate questions and queries from audiences	AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Adapt presentation to heterogeneous audiences; Evaluate the effectiveness of presentations; Show awareness of liability associated with engineering statements and recommendations	AI 490 Capstone AI Engineering Design Project

Graduate attribute:	**8. Professionalism**		
Definition:	An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
PR-1. Role and responsibilities of professional engineers	Introductory	Describe the role of engineers in society especially in Quebec and Canada; Describe the organization of the professional system of engineering; Demonstrate a good understanding of liability in Quebec's legal system	ENCS 282 Technical Writing and Communication ENGR 201 Professional Practice and Responsibility

	Developed / Intermediate	Appreciate the role filled by professional engineers in society; Differentiate between professional and personal roles; Distinguish between dimensions of responsibility - moral, legal & social; Apply responsibility in professional context	AI 390 AI Engineering Design Project AI 392 AI and Society ENGR 202 Sustainable Development and Environmental Stewardship
	Applied / Advanced	Assess situations of professionalism in case studies; Demonstrate professionalism in open-ended team projects	AI 490 Capstone AI Engineering Design Project
PR-2. Professional practice	Introductory	Identify legal issues on occupational safety and intellectual property; Identify values associated with professional practice; Identify relevant professional standards	ENCS 282 Technical Writing and Communication ENGR 201 Professional Practice and Responsibility
	Developed / Intermediate	Communicate through accepted professional means; Apply relevant professional standards with engineering works	AI 380 Trustworthy and Safe AI AI 390 AI Engineering Design Project AI 392 AI and Society ENGR 202 Sustainable Development and Environmental Stewardship
	Applied / Advanced	Adapt values of professional practice in the work environment; Demonstrate successful application of professional standards in open ended engineering works	AI 490 Capstone AI Engineering Design Project

Graduate attribute:	**9. Impact of engineering on society and the environment**		
Definition:	An ability to analyze societal and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
IES-1. Societal impact of engineering	Introductory	Identify the importance of societal impact in driving engineering innovation; Demonstrate familiarity with evolution of technologies; Identify stakeholders where engineering solution has impact	ENGR 202 Sustainable Development and Environmental Stewardship ENGR 301 Engineering Management Principles and Economics
	Developed / Intermediate	Categorize wide range of engineering & society relationships, including economic, social, health, safety, legal and cultural aspects; Analyze considerations of health, safety, and legal issues on engineering practices; Articulate stakeholder perspectives	AI 392 AI and Society
	Applied / Advanced	Diagnose complex social, economic and cultural issues notably indigeneity and marginalization	AI 490 Capstone AI Engineering Design Project
IES-2. Sustainability and environmental stewardship	Introductory	Identify issues related to social and environmental protection; Locate challenges to sustainability from technological design	ENGR 202 Sustainable Development and Environmental Stewardship
	Developed / Intermediate	Evaluate the current and future needs for addressing sustainability and environmental stewardship; Evaluate the impact of engineering practices on the environment; Evaluate the implications of environmental stewardship in technology design; Apply suitable models in engineering design to optimize social and environmental impact	AI 392 AI and Society

	Applied / Advanced	Develop and implement design strategies to incorporate social sustainability; Advocate and lead initiatives to foster a culture of sustainability and environmental stewardship; Critically assess and celebrate contributions towards sustainability and environmental stewardship	AI 490 Capstone AI Engineering Design Project

Graduate attribute:	**10. Ethics and equity**		
Definition:	An ability to apply professional ethics, accountability, and equity.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
EE-1. Professional ethics and accountability	Introductory	Identify duties and obligations in the Professional / Engineer's code	AI 330 Applied Machine Learning ENCS 282 Technical Writing and Communication ENGR 201 Professional Practice and Responsibility ENGR 202 Sustainable Development and Environmental Stewardship
	Developed / Intermediate	Apply accountability to professional context; Differentiate between ethics, morals, values, and law; Define and categorize concepts such as trust and loyalty; Apply professional ethics in case studies; Distinguish professional ethics in Canada and Quebec context	AI 290 Introductory AI Engineering Team Design Project AI 335 Reinforcement Learning AI 340 Generative AI AI 370 AI System Design AI 390 AI Engineering Design Project AI 392 AI and Society AI 487 AI and ML in Cybersecurity ENGR 371 Probability and Statistics for Engineering
	Applied / Advanced	Enhance ethical reasoning by resolving professional dilemmas	AI 345 Agentic AI AI 380 Trustworthy and Safe AI AI 490 Capstone AI Engineering Design Project
EE-2. Equity	Introductory	Describe professional obligations against discrimination; Discuss different dimensions of equity	ENCS 282 Technical Writing and Communication ENGR 201 Professional Practice and Responsibility ENGR 202 Sustainable Development and Environmental Stewardship
	Developed / Intermediate	Identify different dimensions of equity including the importance of gender; Identify economic disparity as a as a form of inequity	AI 335 Reinforcement Learning AI 340 Generative AI AI 390 AI Engineering Design Project AI 392 AI and Society AI 487 AI and ML in Cybersecurity ENGR 301 Engineering Management Principles and Economics
	Applied / Advanced	Assess engineering solutions from social economic equity perspectives; Evaluate the ownership of Intellectual Property; Recognize and prevent/avoid perception biases; Recognize different dimensions of equity; Evaluate equity and inclusion practices	AI 490 Capstone AI Engineering Design Project

Graduate attribute:	**11. Economics and project management**		
Definition:	An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of engineering and to understand their limitations.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
	Introductory	Explain engineering costs; Explain interest and equivalence	AI 290 Introductory AI Engineering Team Design Project

EPM-1. Fundamentals of economics	Developed / Intermediate	Make economic decisions; Prepare and use cash flow diagrams; Perform and use various economic analysis techniques	ENGR 301 Engineering Management Principles and Economics
	Applied / Advanced	Adapt fundamentals to specific cases	AI 490 Capstone AI Engineering Design Project
EPM-2. Economics evaluation of projects	Introductory	Aware of tools for project evaluation	ENGR 301 Engineering Management Principles and Economics
	Developed / Intermediate	Perform economic sensitivity analysis; Perform economic risk analysis; Carry out project cost estimation	AI 390 AI Engineering Design Project
	Applied / Advanced	Perform economic assessment of projects; Evaluate and select alternative projects	AI 490 Capstone AI Engineering Design Project
EPM-3. Project planning and implementation	Introductory	Explain and select organizational structures; Identify critical paths; Identify root causes of project failure; Determine customer satisfaction; Aware of indicators to measure project success; Aware of tools for project scheduling	ENGR 301 Engineering Management Principles and Economics
	Developed / Intermediate	Develop work breakdown structure; Develop project schedules and time estimations; Perform network diagram analysis; Perform project risk analysis	AI 390 AI Engineering Design Project ENGR 301 Engineering Management Principles and Economics
	Applied / Advanced	Build teams and manage team dynamics; Prepare contingency plans	AI 490 Capstone AI Engineering Design Project

Graduate attribute:	**12. Life-long learning**		
Definition:	An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.		
Indicators	**Learning level**	**Learning objectives**	**Course(s)**
LL-1. Identifying missing knowledge and learning opportunities	Introductory	Identify available sources for self-learning; Critique him/herself in situations that require engineering skills	ENGR 233 Applied Advanced Calculus MIAE 221 Materials Science (Eng and Nat Sci elective)
	Developed / Intermediate	Able to identify new or advanced fields / opportunities in his engineering discipline	AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Know his / her shortcomings to tackle a challenge; Can make educated predictions for the future technological and scientific advancements	AI 490 Capstone AI Engineering Design Project
LL-2. Continuous improvement and self-learning	Introductory	Show awareness of various engineering organizations for training opportunities	ENGR 201 Professional Practice and Responsibility MIAE 221 Materials Science (Eng and Nat Sci elective)
	Developed / Intermediate	Self-acquire necessary information from different sources	AI 487 AI and ML in Cybersecurity ENGR 301 Engineering Management Principles and Economics
	Applied / Advanced	Assess a new problem and identify the knowledge necessary to solve it	AI 490 Capstone AI Engineering Design Project

Specific knowledge, expertise, skills (learning outcomes) which students will acquire

By the end of this program, successful students will be able to do the following:

Knowledge

1. Understanding of sciences related to AI engineering:
    - Mathematics

- Computer science
- Computer engineering
- Electrical engineering
- Software engineering

2. Understanding of the fundamentals of AI engineering:
    - Mathematics for AI
    - Machine Learning Foundations
    - Deep Learning and Representation Learning
    - Programming and Software engineering
    - Data Engineering for AI
    - Computing Systems and infrastructure
    - AI model deployment and MLOps
    - Optimisation and Efficient AI
    - Trustworthy and Responsible AI
    - Security for AI
    - AI engineering tools
    - AI Applications and Systems Integration
3. Understanding of the engineering profession:
    - Code of ethics
    - Impact on society of engineering projects and technology
    - Rules and regulations

Skills and abilities

1. Non-technical skills and abilities
    - Critical thinking (structured analysis, research literature, evaluation, conclusion)
    - Problem-solving (problem definition, brainstorming, planning, evaluation)
    - Communication skills (written, oral, active listening, presentation)
    - Teamwork (planning and organization, conflict resolution)
2. Technical skills and abilities
    - Knowledge of **operating systems** (Linux, Windows) and their role in supporting AI frameworks and computing environments
    - Understanding of **computer architecture and parallel computing platforms** used for AI workloads (CPUs, GPUs, and AI accelerators)
    - Experience with **programming languages commonly used in AI development** (e.g., Python, C/C++, and numerical computing libraries)
    - Familiarity with **machine learning and deep learning frameworks** (e.g., PyTorch, TensorFlow, or similar tools)
    - Knowledge of **data processing, data management, and feature engineering techniques** used in AI pipelines
    - Understanding of **model training, evaluation, and validation methodologies** in machine learning systems
    - Ability to **develop, test, and optimize machine learning models** for different applications and datasets
    - Experience with **software engineering practices for AI systems**, including version control, testing, and modular design
    - Familiarity with **distributed and cloud computing platforms** used for training and deploying AI models
    - Knowledge of **model optimization techniques**, such as quantization, pruning, and efficient inference methods
    - Understanding of **AI system deployment and lifecycle management**, including monitoring and model updates
    - Familiarity with **data privacy, fairness, and responsible AI principles** in the development of intelligent systems

- Experience with **containerization and virtualization technologies** (e.g., Docker and similar tools) to support reproducible AI workflows

8. SUPPORT FOR STUDENT SUCCESS

8.1 Financial support

There are various sources of funding available to support the students. Below is a non-exhaustive list of applicable financial support programs to the BEng in AI Engineering and BSc in AI students:

University-wide sources of funding:

- Concordia Council on Student Life Special Project Funding
- Concordia Student Union (CSU)
- Grants for Religious and Spiritual Groups
- QPIRG Discretionary Fund
- Sustainability Action Fund
- Scholarships, bursaries and awards:
    - Concordia University Undergraduate Entrance Scholarship Program
    - Concordia University Undergraduate Entrance Bursary Program
    - Concordia University Undergraduate In-Course Scholarship Program
    - Concordia University Undergraduate In-Course Bursary Program
    - Concordia Awards
- External Awards
- Undergraduate Student Research Awards Program (NSERC-USRA competition)
- Funding administered by Concordia International (Quebec Mobility Bursary, Erasmus+, Mitacs Globalink Research Award)

Scholarships and awards for Engineering and Computer Science students:

- Ahema Award
- André Desmarais Golf Classic Scholarship – GCS
- Campaign For A New Millennium ENCS Scholarship
- Dean M.N.S Swamy Engineering Scholarship for Indigenous Students
- Dominic Faccone Entrance Scholarship in Engineering and Computer Science
- Experiential Learning Award of Excellence in Engineering and Computer Science
- Fariborz and Roya Haghighat Entrance Scholarship in Engineering
- François Plourde Scholarships for Women in Engineering
- Genium360 Awards for Women in Engineering in Student Groups
- Gerald, Maria, and Georginia Daoussis Scholarship
- Gina Cody School Dean's Entrance Scholarship
- Gina Cody School EDI Shuffle Award
- Gina Cody School of Engineering and Computer Science Student Life Award
- Gina Cody School Shuffle Scholarship
- Gina Cody School Women In Engineering Entrance Award
- Groupe LGS Inc. Scholarships in Engineering
- Indigo Consulting Scholarship in Computer Science and Software Engineering
- Jaan Saber, Phoivos Ziogas Memorial Scholarship
- Jack Bordan Engrance Scholarship in Engineering and Computer Science
- Jae Saleh Student Life Award in Engineering
- James McQueen Scholarship
- John N. Economides Scholarship in Engineering and Computer Science
- Joseph and Gabriella Pataki Scholarship for International Female Students in Engineering

- Katalis Award
- Knowledge First Foundation Entrance Excellence Scholarship in Engineering and Computer Science
- Marie and Bob Baird Entrance Scholarship
- Miriam Sobel Award
- Nabil Esmail Undergraduate Excellence in Engineering Scholarship
- NDT Technologies Inc. Scholarship for Engineering and Computer Science
- Normand D. Hebert Entrance Scholarship
- Petrogiannis Family Award for Women in Engineering
- Richard Laurence Weldon Scholarship
- Robert Walsh Entrance Scholarship in Engineering and Computer Science
- Velan Scholarships for Women in Engineering

8.2 Student Services

There are a variety of student services, workshops, and events offered by various offices at Concordia, the Gina Cody School of Engineering and Computer Science, and various student associations. Below is a non-exhaustive list of these services:

- Admission advising
- Academic advising and support
- First-year support counselling
- Orientation sessions
- Immigration advising
- Departmental student events and workshops
- Student Success Centre: Tutoring, skill development, and career planning
- First Stop: Kiosks located in the main buildings around campus where students are directed to appropriate supports or services.
- Student Service Station: Weekly on-line drop-in with academic advisors and staff
- Welcome Crew Mentors
- Birks Students Centre
- IT Support
- Heath and wellness: Medical care clinic and mental health support
- Study help and tutoring (writing assistance, math tutoring, learning specialists)
- Research support and skills development workshops for undergraduates
- Financial and budgeting support and worships
- Residences and food and housing services and support
- Career counselling and advising
- Career planning
- Career events and job fairs
- Student association events
- Capstone Poster Day

Related offices:

- Access Centre for Students with Disabilities
- Advocacy Office
- ASFA Student Life Volunteer Pool
- Birks Student Centre
- Campus Security
- Career Advising and Professional Success
- Career Counselling and Educational Transitions
- Student Parents Centre

- Dean of Students
- Financial Aid and Awards Office
- Health Services Clinic
- Housing and Job Resource Centre
- International Students Office
- IT support (AITS)
- Multi-Faith and Spirituality Centre
- NouLa Black Student Centre
- Student Academic Services
- Student Success Centre
- Otsenhákta Student Centre

8.3 Academic and student life

There are various opportunities for students to be involved in the community and in associations within the university.

Concordia groups and initiatives related to community involvement

- **4th Space**
  A public space on campus that serves as a gateway to research and learning activities at Concordia, where researchers can engage the public in experiential learning.
- **Multi-faith and Spirituality Centre**
  A home on campus for all those who wish to celebrate the human spirit, open to all students whether spiritual, secular or religious.
- **Centre for Gender Advocacy**
  An independent, student-funded organization mandated to promote gender equality and empowerment particularly as it relates to marginalized communities.
- **Centre for Creative Reuse**
  CUCCR is dedicated to diverting materials from inside Concordia's waste-stream and offering them to the general community free of cost.
- **D3 Innovation Hub**
  Center for Innovation and Entrepreneurship that provides the necessary tools, resources and knowledge to move from idea to impact with confidence.
- **SHIFT Centre for Social Transformation**
  Supports existing and emerging social transformation initiatives that unite with the goal of creating a more just, inclusive and broadly prosperous Montreal.
- **Sustainability Hub**
  Promoting sustainability-related initiatives, tools, resources, research, funds and programs to the Concordia community.
- **Otsenhákta Student Centre**
  An on-campus resource for First Nations, Métis and Inuit students to find community, plan social events and access resources to help them achieve academic success.
- **University of the Streets Café**
  A program that organizes bilingual public conversations in cafés and community spaces across Montreal.
- **Zero Waste**
  An initiative focused on reducing waste on campus and encouraging the Concordia community to reduce, reuse, recycle and rot.
- **NouLa Black Student Centre**
  Offers resources, services, and programming for Concordia students from Black communities and supports Black students' success and wellness.
- **Espace Franco**
  A place for French-speaking students to connect with other French-speaking students who are pursuing post-

secondary studies in English for the first time.

- **Office of Community Engagement**
  Connecting faculty, staff and students with members of the wider Montreal community in order to build meaningful relationships.
- **Queer Concordia**
  An on-campus resource centre for queer, lesbian, gay, trans, two-spirited, bisexual, asexual, intersex, questioning and allies.
- **Homeroom**
  A virtual place for new undergraduate students to connect and navigate the university experience together.

Engineering and Computer Science student associations relevant to the B.Eng. in AI Engineering and B.Sc. in AI

- ECA (Engineering and Computer Science Association)
- ECSGA (Engineering and Computer Science Graduate Association)
- GCES (Gina Cody School Entrepreneurship Society)
- EngGames (Engineering Games – Concordia University)
- Hack Concordia
- Space Concordia
- SCS (Software Engineering and Computer Science Society)
- Women in Engineering

Concordia University student associations (selected)

There are 90-100 Concordia University student associations related to culture, nation, ethnicity, politics, athletics, hobbies, and various interests. The following is a representative list of groups that may be of interest to B.Eng. in AI Engineering and B.Sc. in AI students.

- Concordia Student Union (umbrella association)
- ACSiON Concordia (for students from the African diaspora)
- African Students Association of Concordia
- Arab Student Network
- Artificial Intelligence Society Concordia
- Ascend Concordia (cultivating leadership and professional growth)
- Best Buddies
- Biomedical Engineering Club
- Black Students Career Development
- Brazilian Student Association (BRASA) Concordia
- Chess Club Concordia
- Climbing Club
- Concordia Canadian Asian Society
- Concordia Debate Society
- Concordia Game Development
- Concordia Games Club
- Concordia Outdoors Club
- Concordia Student Exchange Association
- Concordia Students Recreational Sports Club
- Egyptian Students' Association
- Electrocon (electronic music)
- Filipino Organization of Concordia University Students
- FINDAC (education on the intersection between finance and data science)
- Google Developer Student Club
- Haitian Students at Concordia

- Heart for Africa (humanitarian)
- Intervarsity at Concordia
- Lebanese Student Association
- MEDLIFE Concordia (trips to underserved regions)
- NanoStride (making AI accessible)
- North African Student Society
- Pakistani Cultural Club
- Palestinian Cultural Club
- Quantitative Research and Competitions Club (QUARCC)
- Running Club Montreal
- Stronger Than Stigma Concordia (overcoming social barriers related to mental health)
- Student Music Club
- Syrian Students Association
- The Concordian (media)
- The Filmmaking Club
- United for Literacy
- Vietnamese Concordia Association

9. RESOURCES

9.1 Faculty Resources

9.1.1. Current Faculty

Full-Time Faculty Members (CSSE):
Batmaz, Anil Ufuk, Dr., Assistant Professor (UB)
Belilovsky, Eugene, Dr., Associate Professor (EB)
Benharref, Abdelghani, Dr., Lecturer (AB)
Bentaleb, Abdelhak, Dr., Assistant Professor, (AB)
Bergler, Sabine, Dr., Professor (SB)
Cespedes, Sandra, Dr., Assistant Professor (SC)
Chen, Tse-Hsun, Dr., Associate Professor (THC)
Constantinides, Constantinos, Dr., Associate Professor (CC)
Costa, Diego, Dr., Assistant Professor, (DC)
Dangel, Felix, Dr., Assistant Professor (FD)
Dargham, Joumana, Dr., Senior Lecturer (JD)
Desai, Bipin, Dr., Professor (BD)
Dohmatob, Elvis, Dr., Assistant Professor (ED)
Eavis, Todd, Dr., Associate Professor (TE)
Fevens, Thomas Gordon, Dr., Professor (TF)
Glatard, Tristan, Dr., Professor (TG)
Goswami, Dhrubajioti, Dr., Associate Professor (DG)
Grahne, Gosta, Dr., Professor (GG)
Gueheneuc, Yann-Gael, Dr., Professor (YG)
Hajjdiab, Hassan, Dr., Lecturer (HH)
Hanna, Aiman, Dr., Teaching Professor (AH)
Harutyunyan, Hovhannes H., Dr., Professor (HHH)
Hosseini, Mahdi, Dr., Assistant Professor (MH)
Houari, Nora, Dr., Senior Lecturer (NH)
Jafarpour, Hamed, Dr., Lecturer (HJ)

Jannatpour, Ali, Dr., Lecturer (AJ)
Jaumard, Brigitte, Dr., Professor (BJ)
Jayakumar, Rajagopalan, Dr., Associate Professor (RJ)
Kersten-Oertel, Marta, Dr., Associate Professor (MKO)
Kosseim, Leila, Dr., Professor (LK)
Krzyzak, Adam, Dr., Professor (AK)
Lovitz, Benjamin, Dr., Assistant Professor (BL)
Mansour, Essam, Dr., Associate Professor (EM)
Mellah, Hakim, Dr., Lecturer (HM)
Mendhurwar, Kaustubha, Dr., Senior Lecturer (KM)
Morales Alvarado, Rodrigo, Dr., Lecturer (RMA)
Mudur, Sudhir, Dr., Professor (SM)
Narayanan, Lata, Dr., Professor (LN)
Pankratov, Denis, Dr., Associate Professor (DP)
Paquet, Joey, Dr., Associate Professor (JP)
Popa, Tiberiu, Dr., Associate Professor (TP)
Poullis, Charalambos, Dr., Professor (CP)
Probst, David, Dr., Associate Professor (DP)
Ravanelli, Mirco, Dr., Assistant Professor (MR)
Rilling, Juergen, Dr., Professor (JR)
Rigby, Peter, Dr., Professor (PR)
Shihab, Emad, Dr., Professor, (ES)
Shiri-Varnaamkhaasti, Nematollaah, Dr., Associate Professor (NS)
Suen, Ching Y., Dr., Professor (CS)
Tan, Shin Hwei, Dr., Associate Professor (SHT)
Tsantalis, Nikolaos, Dr., Professor (NT)
Xiao, Yiming, Dr., Associate Professor (YX)
Yan, Yuhong, Dr., Associate Professor (YY)
Yang, Jinqiu, Dr., Associate Professor (JY)
Wang, Yang, Dr., Associate Professor (YW)
Zhijie Wang, Dr., Assistant Professor (ZW)

Full-Time Faculty Members (ECE):
Agarwal, Anjali, Dr., Professor (AG)
Aghdam, Amir G., Dr., Professor (AA)
Ahmad, M. Omair, Dr., Professor (OA)
Ait Mohamed, Otmane, Dr., Professor (OM)
Bali, Ahmed, Dr., Lecturer (AB)
Benali, Habib, Dr., Professor (HB)
Cai, Jun, Dr., Professor (JC)
Chouchen, Moataz, Dr., Assistant Professor (MC)
Coutinho, Rodolfo W.L., Dr., Associate Professor (RC)
Cowan, Glenn, Dr., Professor (GC)
Goodarzi, Bahareh, Dr., Senior Lecturer (BG)
Hamou-Lhadj, Abdelwahab, Dr., Professor (AH)
Hashtrudi Zad, Shahin, Dr., Associate Professor (SH)
Kharma, Nawwaf, Dr., Professor (NK)
Khendek, Ferhat, Dr., Professor (FK)
Khorasani, Kash, Dr., Professor (KK)
Lago, Paula, Dr., Assistant Professor (PL)
Le Beux, Sébastien, Dr., Associate Professor (SL)
Liu, Yan, Dr., Professor (YL)

Lynch, William E., Dr., Professor (WL)
Mehmet Ali, Mustafa K., Dr., Professor (MM)
Qiu, Dongyu, Dr., Associate Professor (DQ)
Rezanejad, Morteza, Dr., Assistant Professor (MR)
Rivaz, Hassan, Dr., Professor (HR)
Rodrigues, Luis, Dr., Professor (LR)
Skonieczny, Krzysztof, Dr., Professor (KS)
Soleymani, M. Reza, Dr., Professor (RS)
Tahar, Sofiène, Dr., Professor (ST)
Trueman, Christopher W., Dr., Professor (CT)
Wang, Chunyan, Dr., Professor (CW)
Zhang, Gengrui (Edward), Dr., Assistant Professor (GZ)
Zhu, Wei-Ping, Dr., Professor (WZ)
Zuo, Xinxin, Dr., Assistant Professor (XZ)

Full-Time Faculty Members (CIISE):
Amayri, Manar, Dr., Assistant Professor (MA)
Assi, Chadi, Dr., Professor (CA)
Awasthi, Anjali, Dr., Professor (AnA)
Ayub, Ali, Dr., Assistant Professor (AiA)
Basyouni, Ayda, Dr., Senior Lecturer (AB)
Ben Hamza, Abdessamad, Dr., Professor (ABH)
Bentahar, Jamal, Dr., Professor (JB)
Bouguila, Nizar, Dr., Professor (NB)
Clark, Jeremy, Dr., Associate Professor (JC)
Debbabi, Mourad, Dr., Professor (MD)
Dssouli, Rachida, Dr., Professor (RD)
Fu, Honghao, Dr., Assistant Professor (HF)
Fung, Carol, Dr., Associate Professor (CF)
Ghafouri, Mohsen, Dr., Associate Professor (MG)
Glitho, Roch, Dr., Professor (RG)
Hammad, Amin, Dr., Professor (AmH)
Lucia, Walter, Dr., Associate Professor (WL)
Majumdar, Suryadipta, Dr., Associate Professor (SuM)
Mannan, Mohammad, Dr., Professor (MM)
Mohammadi, Arash, Dr., Associate Professor (AM)
Naderkhani, Farnoosh, Dr., Associate Professor (FN)
Patterson, Zachary, Dr., Professor (ZP)
Schiffauerova, Andrea, Dr., Professor (AS)
Wang, Chun, Dr., Professor (CW)
Yan, Jun, Dr., Associate Professor (JY)
Youssef, Amr, Dr., Professor (AY)
Zeng, Yong, Dr., Professor (YZ)
Please see Appendix 5 for the CVs of current faculty members. Table 9.1 below demonstrates the ability of the faculty to teach the planned AI courses in this program.

Table 9.1. Faculty Teaching Capabilities

Course Codes	Course Titles	Professor Initials	# of profs
CORE COURSES			
AI 228	System Hardware	CIISE: AB, AY, CA, CF, HM, IP, JC, JY, LW, MM, MP, RD, SeM, SuM, TE | CSSE: AB, AG, OA, SF, SL | ECE: AA, AB, GC, OA, RS, SL, ST	27
AI 231	Discrete Mathematics	CIISE: HF | ECE: AG, JC, RS, SH | CSSE: AJ, AK, BJ, DP, GG, HH, LN, SB	13
AI 243	Programming Methodology	CIISE: HF | ECE: AB, AH, BG, FK, GZ, MC, MM, NK, PL, YL, XZ | CSSE: AB, AH, AJ, DC, HH, HJ, HM, KM, NH	21
AI 249	Object-Oriented Programming	CIISE: AB, AY, JC, MM, SeM, SuM | CSSE: AB, AH, AJ, DC, HH, HJ, HM, KM, NH | ECE: AB, AH, BG, FK, GZ, MC, NK, PL, MM, YL, XZ	26
AI 290	Introductory AI Engineering Team Design Project	CSSE: ES, DC, JY, PR, THC, ZW | ECE: AH, KK, MC, YZ	10
AI 300	Mathematics for AI	CIISE: ABH | CSSE: EB, ED, FD, MH, MR, YX | ECE: HR, MC	9
AI 330	Machine Learning	CSSE: EB, ED, FD, LK, MH, MR, SB, YX | ECE: AB, AH, GZ, HB, HR, KK, KS, MC, MR, NK, PL, WZ, YL, XZ	22
AI 333	Big Data Analytics	CIISE: AB, ABH, AiH, AlA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, LW, MA, MD, MG, MM, MP, NB, RD, RG, SeM, SuM, WL, YZ, ZP | CSSE: EM, TG | ECE: GZ, YL	32
AI 334	Deep Learning	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: EB, ED, FD, MH, MR, YX | ECE: AB, AH, AO, GZ, HB, HR, KK, KS, MC, MR, NK, PL, WZ , XZ, YL	37
AI 335	Reinforcement Learning	CIISE: AB, AiH, AlA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, YZ | CSSE: EB, ED, FD, MR | ECE: KK, KS, MR	30
AI 340	Generative AI	CSSE: DC, EB, ED, ES, FD, MH, MR, YX, ZW | ECE: AB, MR, YL	12
AI 345	Agentic AI	CIISE: AB, ABH, AiH, AlA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, WL | CSSE: DC, ES, JY, PR, THC, ZW | ECE: AB, MR, YL	33
AI 346	Operating Systems	CIISE: AB, AY, JC, LW, MD, RD, SeM, SuM | CSSE: AH, AJ, DG | ECE: BG, FK, GZ, PL, AH	16
AI 350	AI-Centric Computer Architecture	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | ECE: AB, OA, SF, SL	20
AI 352	Data Structures and Algorithms	CIISE : AB, AiH, AlA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: AH, AJ, DC, DG, DG, HM, TF, TP | ECE: AB, AH, BG, CR, FK, GZ, MC, NK, PL, YL, XZ	37
AI 370	AI System Design	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: DC, ES, JY, PR, THC, ZW | ECE: AH, MC, YL	25
AI 380	Trustworthy and Safe AI	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: DC, ES, JY, PR, THC | ECE: XZ, YL	23
AI 390	AI Engineering Design	CIISE: ES, DC, JY, PR, THC, ZW | CSSE: DC, ES, JY, PR, THC,	16

	Project	ZW | ECE: AH, DQ, NK, WL	
AI 487	AI and Machine Learning in Cybersecurity	CIISE: AB, ABH, AiH, AlA, AM, AY, CA, CF, IP, JB, JC, JY, MA, MD, MM, MP, RD, RG, SeM, SuM	20
AI 490	Capstone AI Engineering Design Project	CIISE: AB, AiH, AlA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MD, MM, MP, RD, RG, SuM, YZ | CSSE: ES, DC, JY, PR, THC, ZW | ECE: AH, BG, CW, KS, LR, NK, SH, WL	33
TECHNICAL ELECTIVES			
AI Software			
AI 434	Distributed Learning	CSSE: EB | ECE: GZ	2
AI 436	Deep Learning for Computational Pathology	CSSE: MH	1
AI 449	Machine Learning Theory	CSSE: EB, ED, FD, MR	4
AI 459	AI for Media and Content Delivery Networks	CIISE: AB, SC	2
AI 469	Conversational Artificial Intelligence	CSSE: AB, SC	2
AI 470	Engineering AI-Based Software Systems	CSSE: DC, ES, JY, PR, TH	5
AI 472	Generative AI for Software Engineering	CSSE: DC, PR, JY, THC | ECE: AH, MC	6
AI 474	AI-Driven Software Improvement and Repair	CSSE: JY, PR, THC | ECE: AH, MC	5
Cybersecurity for AI			
AI 415	Hardware Security for AI Systems	CIISE: AM, JY, MG, WL	4
AI 425	Resilient AI in Safety-Critical Applications	CIISE: JY, MG, SuM	3
AI Hardware and Intelligent Systems			
AI 401	Edge AI	ECE: AB, OA, SL, ST	4
AI 411	AI Hardware Accelerators	ECE: AB, OA, SL, ST	4
AI 412	AI for Wearable Health Applications	ECE: HB, HR, MR, PL	4
AI 421	Cloud Vector Database Systems for AI	ECE: GZ, YL	2
AI 424	Optimization for Machine Learning	ECE: AG, KK, LR	3
AI 441	MLOps: Machine Learning Operations	ECE: AH, MC, YL	3
AI 442	Explainable AI Engineering Process and Validation	ECE: YL	1
AI 443	Embodied AI	ECE: KS, XZ	2
Other / General			
AI 431	Cloud AI and Distributed ML	CIISE: AiA	1
AI 432	Robot Learning	CIISE: AiA, AM	2
AI 454	Quantum Machine Learning	CIISE: HF| CSSE: BL | ECE: RS	3

9.1.2. Faculty Hiring Plan

In Year 0, we will need to select an Undergraduate Program Director from either CIISE, CSSE or ECE with a remission of 1.5 credits to handle the launch of the program. In year 1, this course remission will increase to 3.0 credits per year for handling the operations and curriculum management tasks. In year 1, the Program Director will be assigned the task of interfacing with the Institute for Co-operative Education for the students who are enrolled in the various internship

options (Co-op program, C-Edge, ACE), also receiving a course remission of 1.5 credits per year.

Currently, CIISE, CSSE, and ECE bring together a substantial cohort of faculty members with expertise in artificial intelligence and closely related areas, providing strong support for the proposed program. In addition, as shown in Table 9.1 many existing faculty members can also teach fundamental mathematics, computer science, and computer engineering courses in the proposed curriculum. By carefully examining the potential teaching capacity of CIISE, CSSE, and ECE faculty members and their existing teaching load, we determined that existing faculty members can take 50 sessions a year for the newly proposed BEng AI Program. In this case, we don't require any additional tenure-track faculty positions for this BEng AI Program. In year 1, one ETA is to be made available at the commencement of full program operations. From Year 3 onwards, we require an additional ETA to accommodate the increased course load in each of the two years. In the following, we explain how the required resources can be used to cover the course sessions required by the program.

Table 9.2 shows the number of course sessions needed for a regular typical course sequence (without co-op option) for the first four years of the program. In this sequence each course will only be offered once per year. However, this is not sufficient to support co-op options and it does not provide the flexibility for some students who could not follow the typical sequence due to various reasons. In addition, we also need to reserve the capacity for students registered in the proposed AI BSc. program. Therefore, as shown in Table 9.3, for core AI courses, we have decided to offer two sessions a year. This way we can provide sufficient sessions to cover the need for co-op options and provide higher capacity for additional students and more flexibility for students who need an alternative sequence. For general engineering courses (ENGR/ENCS/ELEC/General Electives), only one session is planned for each year. Note that all the as these courses are offered by other programs throughout the year, which already provides flexibility and capacity for needed students.

Table 9.2 Number of sessions needed (Typical Course Sequence)

	ENGR / ENCS / ELEC / GE	AI Core	AI Electives	AI Capstone
Year 1	7	3	0	0
Year 2	2	8	0	0
Year 3	1	7	1	0
Year 4	0	2	5	2

Table 9.3 Number of sessions needed to cover co-op and provide higher capacity and more flexibility

	ENGR / ENCS / ELEC / GE	AI Core	AI Electives	AI Capstone
Year 1	5	6	0	0
Year 2	3	16	0	0
Year 3	1	14	1	0
Year 4	2	4	5	2

Table 9.4 Accumulative Load and Resources Required

	ENGR / ENCS / ELEC / Gen Elec	AI Core	AI Electives	AI Capstone
Year 1	7	6	0	0
	TT (3 Sessions) + 1 ETA (4 sessions) + TA (700 H)	TT (6 Sessions) + 1 ETA (3 sessions) + TA (600 H)		
Year 2	9	22	0	0
	TT (5 Sessions) + 1 ETA (4 sessions) + TA (900H)	TT (19 Sessions) + 1 ETA (3 Sessions) + TA (2200 H)		
Year 3	10	36	1	0
	TT (6 Sessions) + 2 ETA (4	TT (27 Sessions) + 2 ETA (10 Sessions) +		

	sessions) + TA (1000H)	TA (3700 H)		
Year 4 Full Load	10	40	6	2
	TT (6 Sessions) + 2 ETA (4 sessions) + TA (1000H)	TT (38 Sessions) + 2 ETA (10 Sessions) + TA (4800H)		

Based on the updated course load in Table 9.3, the accumulative course sessions needed for each of the first four years and the resources needed to cover the load are as shown in Table 9.4. In Year 1 of the program, 1 ETA is needed to cover 4 sessions of ENGR / ENCS / ELEC / General Electives courses, and 3 sessions of BEng AI Core courses, and a total of 9 sessions will be taught by existing faculty members. In Year 2 of the program, 1 ETA is needed to cover 4 sessions of ENGR / ENCS / ELEC /General Electives courses, and 3 sessions of BEng AI Core courses, and a total of 24 sessions will be taught by existing faculty members. In Year 3 of the program, 2 ETAs are needed to cover 4 sessions of ENGR / ENCS / ELEC / General Electives courses, and 10 sessions of BEng AI Core courses, and a total of 33 sessions will be taught by existing faculty members. In Year 4 of the program, 2 ETAs are needed to cover 4 sessions of ENGR / ENCS / ELEC / General Electives courses, and 10 sessions of BEng AI Core/Elective courses, and a total of 44 sessions will be taught by existing faculty members. The program will reach its full and regular load in Year 4.

9.1.3. Support Measures for Teaching

The Centre for Teaching and Learning (CTL) at Concordia University provides new and existing faculty members with a wide range of pedagogical and professional development support, from course design, lesson planning, teaching and assessment strategies, instructional technologies, online or blending learning, inclusive teaching practice, student engagement to course evaluations and the teaching dossier. The support is offered in various formats, from web resources, e-learning modules, and one-on-one teaching consultation to various programming offerings and events such as workshops, webinars, New Faculty Orientation, Winterfest (teaching and learning festivals), and special projects.

CTL web resources
The CTL website houses an abundance of teaching and learning resources created or curated by the CTL staff[23]. The content is constantly updated to reflect the current needs of instructors teaching at Concordia as well as to keep abreast of recent trends in faculty development in higher education. New faculty will find the website especially helpful in quickly identifying different kinds of teaching support available to them.

Teaching Academy eLearning modules
The Teaching Academy eLearning modules developed by the CTL in collaboration with eConcordia are dedicated to promoting teaching excellence and continuous professional development for faculty[24]. The topics are divided into modules and further segmented into micro-modules. The content in each module and micro-module both stands alone and clearly links to related topics, allowing instructors to quickly learn some strategies to meet a particular need as well as follow a learning path to systematically improve certain facets or areas in their teaching practice, such as assessment in general. Like the CTL website, Teaching Academy is also public-facing and freely available to instructors.

New Faculty Orientation
Faculty new hires are invited to participate in the annual CTL New Faculty Orientation that usually takes place in August. The event introduces new faculty members to various pedagogical support and services available to them and helps them kick-start their teaching career at Concordia by encouraging them to think about what teaching means and what it takes to be an effective teacher.

Workshop and webinars
Faculty members are advised to check the Event section of the CTL website regularly, especially before the start of a new term. The CTL offers workshops and webinars throughout an academic term, esp. in August, September, December, and January. The Fall and Winter semester workshop and webinar information and registration links are usually sent to

[23] https://www.concordia.ca/ctl.html
[24] https://teachingacademy.concordia.ca/

departments as well, which will, in turn, be shared with all instructors[25].

Teaching consultation

New faculty members are encouraged to book consultations with Teaching Consultants at the CTL, who can meet with instructors to provide advice, support, and resources on a wide variety of teaching-related topics. Here are some of the most common consultation topics:

1. Reviewing a course syllabus
2. Decolonizing and indigenizing the classroom/curriculum
3. Selecting and implementing the appropriate pedagogical approach, teaching strategies, and techniques, such as: active learning, flipped classroom, group work, class discussions, etc.
4. Classroom management issues
5. Designing assignments and other assessments
6. Grading
7. Selecting the most appropriate technologies
8. Implementing inclusive teaching strategies
9. Lesson planning
10. Preparing a teaching dossier (refer to the Teaching Dossier[26].)
11. Interpreting course evaluations (refer to the Course evaluations[27].)

Teaching observation and feedback

Classroom Observations can be requested by instructors at any stage in their career who are interested in getting feedback on their teaching. The Teaching Consultant regularly observes classes to provide feedback on pedagogy, classroom management, etc.

Once an instructor requests an observation, the Teaching Consultant will be in touch to set up a Pre-Observation meeting to discuss background information and the instructor's specific motivation for the observation. The Teaching Consultant will observe a lecture at a pre-determined time. After the lesson, the instructor completes a reflection, and the Teaching Consultant prepares a confidential report on the lesson. Within one week of the observed lesson, the Teaching Consultant and instructor meet to discuss the lesson and review the report with observations, comments, and suggestions before it is finalized.

Course (Re)Design

If an instructor would like support in developing a new course or revamping an existing course, the CTL can work with individual or a team of instructors to ensure the development of the course follows an evidence-based approach to course design. The CTL can provide support materials and expertise on every aspect of the design of courses as they work together with instructors through each step.

Mid-course feedback

Mid-course feedback can provide valuable information for making changes in teaching before summative evaluation of a course. A teaching consultant is available to aid with interpretation of responses and offer suggestions for improving teaching effectiveness.

[25] https://www.concordia.ca/ctl/events/workshops.html
[26] https://www.concordia.ca/ctl/professional-development/teaching-dossier/renewal.html
[27] https://www.concordia.ca/ctl/course-design/mid-evaluations.html

9.2 Administrative and support staff

9.2.1. Current Administrative, Technical and Support Staff

Department	CIISE	CSSE	ECE
Department Administrator	Kimberley Adams	Massy Joulani	Tatyana Bobrova
Assistant to the Director / Chair	TBD	Mary Tzanetakos	Kristin Tedd
Office Assistant	Laura Oproiu	Vanessa Anania	Elvyra Simkute
Undergraduate Program Assistant	TBD	Carly Carruthers Laurel Tidman Vanessa Anania	Gulzat Temirova Sabrina Gendron
Technical Officer	TBD	Alexander Aric	N/A
Technical Specialist	TBD	Nathan Crozier	Chafic Brikho Alexy Voronko Jorris Moreau
Laboratory Coordinator	TBD	Nimalan Yoganathan	
Engineering Specialist	N/A	N/A	Tadeusz Obuchowicz Shiyu Qin
Engineering in Residence	TBD	N/A	Dmitry Rozhdestvenskiy
Design Project Specialist	N/A	N/A	Bipinkumar Patel

9.2.2. Future Administrative, Technical and Support Staff

At the launch of the program, we request one Undergraduate Program Assistant for the BEng and BSc program to support program operations including, for example, working with the Undergraduate Program Director in managing the program, taking on the role of answering program related queries from potential and current students, as well as supporting faculty members. The Undergraduate Program Assistant will be first point of contact of students in this new program. The Undergraduate Program Assistant will work in collaborations with the Undergraduate Program Assistants of the three departments. In addition, we are requesting one engineer-in-residence in the second year to handle specific project-based courses and capstones offered in this program.

Table 9.5 Staff Members Hiring Plan

AY	# BEng Students*	Requested Admin	Requested Tech
2027-28	0	-	-
2028-29	50	Programs Assistant	-
2029-30	120	Programs Assistant	Engineer in Residence
2030-31	208	Programs Assistant	Engineer in Residence
2031-32	287	Programs Assistant	Engineer in Residence
2032-33	325	Programs Assistant	Engineer in Residence

**Cohort to grow to 100 in steady state. 10% attrition rate applied. Total enrolments in any given academic year, once a full cohort in all years is achieved, is expected to hover around 325.*

9.3 Material, technological and library resources

9.3.1. Library support and holdings

The Library provides support to both faculty and students in navigating the information ecosystem both broadly. and alongside the transformational changes occurring in this ecosystem because of recent advances in artificial intelligence.

As part of its long-standing commitment to information literacy, the Library supports AI literacy across the campus in several ways. It has developed online learning modules for both faculty and students to support baseline foundational knowledge and critical thinking around the use of AI for different types of information tasks. General and discipline-specific workshops are constantly updated to include AI tools (both standalone and those embedded in disciplinary databases and platforms). Guidance on when and how to acknowledge the use of AI in academic and professional contexts is also provided through an extensive online guide. (See the Library's AI Literacy website). The Library also maintains a website to curate AI resources from across the campus, e.g. IITS, CTL, Library, etc. (See the Library's AI Resources Hub)

For engineering professions, technical competence alongside safe and ethical decision-making requires a commitment to information currency and lifelong learning. Methods for following industry trends, research advances, governmental policy, professional standards, etc. are crucial. The Library can support students in their academic work, in their experiential learning placements, and in their ongoing professional lives by introducing environmental scanning methods and resources that will serve them while at Concordia (licensed resources and tools) and beyond (open resources and tools). Data sources and data management is critical to work in artificial intelligence, and the Library can also provide guidance in finding and managing datasets for academic, research and professional contexts.

The Webster and Vanier libraries provide a variety of group and individual study spaces to support different tasks and needs. In person and online chat options are available for students needing support in finding or using information resources. Course materials chosen by faculty are made available in print or online formats through the Library's Course Reserves system, reducing textbook / coursepack cost barriers for students. The Technology Sandbox and Visualization Studio have specialized hardware and software that may support certain types of student projects.

For the assessment of library holdings (databases, journals, etc.) to support the teaching and learning needs of this new program, see the Concordia University Library Report in Appendix 4.

9.3.2. Classroom space

Classroom space for new AI courses (lectures and tutorials) will be available at the SGW campus for the appropriate enrollments as the course grows and will be assigned through the University.

9.3.3. Laboratory space and equipment

GCS recognizes the importance of hands-on laboratory experience in providing a comprehensive engineering education. To support its students in this regard, GCS has developed a range of teaching labs that offer diverse learning opportunities.

Several dedicated teaching labs are located on the 8th and 9th floor of the Hall building and are used by CIISE/CSSE/ECE students enrolled in several courses for hands-on laboratories. It is anticipated that the programs can be established with relatively minor capital injections through regular capital project competitions at Concordia University. This assumes an annual intake of about 100 new students in BEng in AI Engineering program and 100 new students in BSc in AI program so that, with attrition, the total number of students in both programs will be around 600. If the intake significantly exceeds 100 students per year in each program, additional lab space and larger classrooms will be needed.

The AI-specialized components will be designed as virtual labs accessible from the existing CIISE/CSSE/ECE teaching facilities, requiring no additional lab space physically. They will be either built as portable platforms that can be handily installed/uninstalled in the Hall building teaching labs, or as (co-)simulated modules hosted on existing CIISE/CSSE/ECE computing infrastructures (e.g., the "Speed" and "Viryia" computer clusters) and remotely accessible from computers in the Hall building teaching labs, GCS general labs, and/or student's personal laptops.

APPENDICES

Appendix 1:	Official description of the program
Appendix 2:	Course outlines and descriptions
Appendix 3:	Needs Analysis, Surveys, Market Analysis, Environmental Scans
Appendix 4:	Library Report
Appendix 5:	Faculty CVs
Appendix 6:	List of external persons consulted in the preparation of the program proposal
Appendix 7:	Full detailed program expenses and revenues

Summary of Changes (New Undergraduate Program (Regular Process))

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
AI 228 System Hardware	★	★	★	★	★	★	★	★	★	★
AI 231 Discrete Mathematics	★	★	★	★	★	★	★	★	★	★
AI 243 Programming Methodology	★	★	★	★	★	★	★	★	★	★
AI 249 Object-Oriented Programming	★	★	★	★	★	★	★	★	★	★
AI 290 Introductory AI Engineering Team Design Project - NEW	★	★	★	★	★		★	★	★	
AI 300 Mathematics for AI - NEW	★	★	★	★	★		★	★	★	
AI 330 Applied Machine Learning	★	★	★	★	★	★	★	★	★	★
AI 333 Big Data Analytics	★	★	★	★	★	★	★	★	★	★
AI 334 Deep Learning	★	★	★	★	★	★	★	★	★	★
AI 335 Reinforcement Learning - NEW	★	★	★	★	★		★	★	★	
AI 340 Generative Artificial Intelligence - NEW	★	★	★	★	★		★	★	★	

AI 345 Agentic AI - NEW	★	★	★	★	★		★	★	★	★
AI 346 Operating Systems	★	★	★	★	★	★	★	★	★	★
AI 350 Computer Architecture for AI - NEW	★	★	★	★	★		★	★	★	
AI 352 Data Structures and Algorithms	★	★	★	★	★	★	★	★	★	★
AI 370 AI System Design - NEW	★	★	★	★	★		★	★	★	
AI 380 Trustworthy and Safe AI - NEW	★	★	★	★	★		★	★	★	
AI 390 AI Engineering Design Project - NEW	★	★	★	★	★		★	★	★	
AI 392 AI and Society - NEW	★	★	★	★	★		★	★	★	
AI 401 Edge AI - NEW	★	★	★	★	★		★	★	★	
AI 411 AI Hardware Accelerators - NEW	★	★	★	★	★		★	★	★	
AI 412 AI for Wearable Health Applications - NEW	★	★	★	★	★		★	★	★	
AI 415 Hardware Security for AI Systems - NEW	★	★	★	★	★		★	★	★	
AI 421 Cloud Vector Database Systems for AI - NEW	★	★	★	★	★		★	★	★	
AI 424 Optimization for Machine	★	★	★	★	★		★	★	★	

Learning - NEW										
AI 425 Resilient AI in Safety-Critical Applications - NEW	★	★	★	★	★		★	★	★	
AI 431 Cloud AI and Distributed Machine Learning - NEW	★	★	★	★	★		★	★	★	
AI 432 Robot Learning - NEW	★	★	★	★	★		★	★	★	
AI 434 Distributed Learning - NEW	★	★	★	★	★	★	★	★	★	★
AI 436 Deep Learning for Computational Pathology - NEW	★	★	★	★	★		★	★	★	
AI 441 MLOps: Machine Learning Operations - NEW	★	★	★	★	★		★	★	★	
AI 442 Explainable AI Engineering Process and Validation - NEW	★	★	★	★	★		★	★	★	
AI 443 Embodied AI - NEW	★	★	★	★	★		★	★	★	
AI 449 Machine Learning Theory - NEW	★	★	★	★	★		★	★	★	
AI 454 Quantum Machine Learning - NEW	★	★	★	★	★		★	★	★	
AI 459 AI for	★	★	★	★	★		★	★	★	

Media and Content Delivery Networks - NEW										
AI 469 Conversational AI - NEW	★	★	★	★	★		★	★	★	
AI 470 Engineering AI-Based Software Systems - NEW	★	★	★	★			★	★	★	
AI 472 Generative AI for Software Engineering	★	★	★	★	★	★	★	★	★	★
AI 474 AI-Driven Software Improvement and Repair	★	★	★	★	★	★	★	★	★	★
AI 487 AI and ML in Cybersecurity	★	★	★	★	★	★	★	★	★	★
AI 490 Capstone AI Engineering Design Project - NEW	★	★	★	★	★		★	★	★	

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
AI Engineering Core	★	★	★
AI Electives - description of requirements	★	★	★
AI Hardware and Intelligent Systems (elective group)	★	★	
AI Software (elective group)	★	★	
Cybersecurity for AI (elective group)	★	★	
General Technical Electives (elective group)	★	★	
Engineering and Natural Science Group	★	★	★

BEng in AI Engineering Extended Credit Program	★	★	
BSc in AI Extended Credit Program	★	★	★
BSc in AI ECP Electives Exclusion List	★	★	

Regulation Changes:

- Degree Requirements
- ECP notes

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Degree Requirements
Calendar Section Type: Regulation
Description of Change: Degree Requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence)

Present Text calendar	Proposed Text
	Degree Requirements The BEng in Artificial Intelligence Engineering consists of the Engineering Core , the Artificial Intelligence Engineering Core , Engineering and Natural Science Group: Artificial Intelligence Engineering , and Artificial Intelligence Engineering Electives as shown below. The minimum length of the program is 120 credits.

Rationale:
This introductory text describes the degree requirements for the BEng in AI Engineering.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: BEng in Artificial Intelligence Engineering
Calendar Section Type: Program
Description of Change: BEng in AI Engineering - requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science
Program Name: BEng in Artificial Intelligence Engineering
Program Type: Major
Degree: Major

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements

Type of Change: New Program

Present Text calendar	**Proposed Text**
credits	**120 credits** BEng in Artificial Intelligence Engineering
0	~~0~~ 27.5 credits from the Engineering Core
	70 credits from the Artificial Intelligence Engineering Core
	3 credits from Engineering and Natural Science Group: Artificial Intelligence Engineering
	19.5 credits from Artificial Intelligence Engineering Electives

Rationale:

Description of degree requirements for the B.Eng. in AI Engineering program.

Note: A program change must be submitted for the Engineering Core to add notes related to the AI Engineering program, at the appropriate

time. (ENGR 391 is not taken by AI Engineering students. AI 392 is taken instead of ENGR 392, and the credits are reduced from 30.5 to 27.5 credits.)

Resource Implications:

None.

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Artificial Intelligence Engineering Core
Calendar Section Type: Defined group
Description of Change: AI Engineering Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	70 credits	Artificial Intelligence Engineering Core
0	~~0~~	AI 228 System Hardware (4) AI 231 Discrete Mathematics (3) AI 243 Programming Methodology (3.5) AI 249 Object-Oriented Programming (3.5) AI 290 Introductory AI Engineering Team Design Project (3) AI 300 Mathematics for AI (3) AI 330 Applied Machine Learning (3) AI 333 Big Data Analytics (4) AI 334 Deep Learning (4) AI 335 Reinforcement Learning (4) AI 340 Generative Artificial Intelligence (4) AI 345 Agentic AI (3) AI 346 Operating Systems (4) AI 350 Computer Architecture for Artificial Intelligence (3) AI 352 Data Structures and Algorithms (3) AI 370 Artificial Intelligence System Design (3) AI 380 Trustworthy and Safe Artificial Intelligence (3) AI 390 Artificial Intelligence Engineering Design Project (3) AI 487 Artificial Intelligence and Machine Learning in Cybersecurity (3) AI 490 Capstone Artificial Intelligence Engineering Design Project (6)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Artificial Intelligence Engineering Electives
Calendar Section Type: Defined group
Description of Change: AI Electives - description of requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	19.5 credits	Artificial Intelligence Engineering Electives
0	~~0~~	Students must complete 19.5 credits from the Artificial Intelligence Electives listed below. Courses are listed in groups to indicate areas of specialization: AI Hardware and Intelligent Systems Electives (BEng) AI Software Electives (BEng) Cybersecurity for AI Electives (BEng)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI Hardware and Intelligent Systems Electives (BEng)
Calendar Section Type: Defined group
Description of Change: AI Hardware and Intelligent Systems (elective group)

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering > Artificial Intelligence Engineering Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	AI Hardware and Intelligent Systems Electives (BEng)
0	~~0~~	AI 401 Edge Artificial Intelligence (4) AI 411 Artificial Intelligence Hardware Accelerators (4) AI 412 Artificial Intelligence for Wearable Health Applications (4) AI 421 Cloud Vector Database Systems for Artificial Intelligence (4) AI 424 Optimization for Machine Learning (4) AI 441 MLOps: Machine Learning Operations (4) AI 442 Explainable Artificial Intelligence Engineering Process and Validation (4) AI 443 Embodied Artificial Intelligence (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI Software Electives (BEng)
Calendar Section Type: Defined group
Description of Change: AI Software (elective group)

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering > Artificial Intelligence Engineering Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	AI Software Electives (BEng)
0	~~0~~	AI 434 Distributed Learning (4) AI 436 Deep Learning for Computational Pathology (4) AI 449 Machine Learning Theory (4) AI 459 Artificial Intelligence for Media and Content Delivery Networks (4) AI 469 Conversational Artificial Intelligence (4) AI 470 Engineering Artificial Intelligence-Based Software Systems (4) AI 472 Generative Artificial Intelligence for Software Engineering (4) AI 474 AI-Driven Software Improvement and Repair (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Cybersecurity for AI Electives (BEng)
Calendar Section Type: Defined group
Description of Change: Cybersecurity for AI (elective group)

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering > Artificial Intelligence Engineering Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	Cybersecurity for AI Electives (BEng)
0	~~0~~	AI 415 Hardware Security for Artificial Intelligence Systems (4) AI 425 Resilient Artificial Intelligence in Safety-Critical Applications (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: General AI Technical Electives (BEng)
Calendar Section Type: Defined group
Description of Change: General Technical Electives (elective group)

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering > Artificial Intelligence Engineering Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	General AI Technical Electives (BEng)
0	~~0~~	AI 431 Cloud AI and Distributed Machine Learning (4) AI 432 Robot Learning (4) AI 454 Quantum Machine Learning (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Engineering and Natural Science Group: Artificial Intelligence Engineering
Calendar Section Type: Defined group
Description of Change: Engineering and Natural Science Group

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) > Degree Requirements > BEng in Artificial Intelligence Engineering

Type of Change: New Defined Group

Present Text calendar	Proposed Text
	3 credits Engineering and Natural Science Group: Artificial Intelligence Engineering
0	~~0~~ Students must complete 3 credits from the following: ENGR 245 Mechanical Analysis (3) MIAE 221 Materials Science (3)

Rationale:

Resource Implications:

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: ECP notes

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence

Present Text calendar	Proposed Text
	Notes Students admitted to an Extended Credit Program (ECP) under the provisions of Section 13.3 Admission Requirements or Section 13.8 Selection Process and Notification must successfully complete a minimum of 120 credits including the requirements below.

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: BEng in Artificial Intelligence Engineering Extended Credit Program
Calendar Section Type: Defined group
Description of Change: BEng in AI Engineering Extended Credit Program

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Notes

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	BEng in Artificial Intelligence Engineering Extended Credit Program
0	~~0~~	Please see the Extended Credit Program requirements for the BEng under Section 71.20.2 Alternative Entry Programs .

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: BSc in Artificial Intelligence Extended Credit Program
Calendar Section Type: Defined group
Description of Change: BSc in AI Extended Credit Program

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Notes

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	120 credits	BSc in Artificial Intelligence Extended Credit Program
0	~~0~~	90 credits of program requirements as set out in the BSc in Artificial Intelligence
		9 credits: MATH 203 Differential and Integral Calculus I (3) MATH 204 Vectors and Matrices (3) MATH 205 Differential and Integral Calculus II (3)
		6 credits chosen from General Education Humanities and Social Sciences Electives as noted in Section 71.110 Complementary Studies for Engineering and Computer Science Students . Note: English as a Second Language Courses and courses that focuses on the acquisition of a language may not be used to meet this requirement.
		15 ECP elective credits chosen from outside the Gina Cody School of Engineering and the Artificial Intelligence ECP Electives Exclusion List [tag] below.

Rationale:
The ECP for the BSc is included in the BEng proposal as the requirements are described within the same section of the Undergraduate Calendar.

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: Artificial Intelligence ECP Electives Exclusion List
Calendar Section Type: Defined group
Description of Change: BSc in AI ECP Electives Exclusion List

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Notes > BSc in Artificial Intelligence Extended Credit Program

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	Artificial Intelligence ECP Electives Exclusion List
0	~~0~~	The following courses may not be taken for credit to fulfill the ECP Electives requirement for the BSc in Artificial Intelligence: BIOL 200 Fundamentals of Human Biology (3) BTM 200 Fundamentals of Information Technology (3) BTM 380 Business Application Development (3) BTM 382 Database Management (3) COMP 218 Fundamentals of Programming (3) ENGL 206 Fundamentals of Written English – Stage I (3) ENGL 207 Fundamentals of Written English – Stage II (3) ENGL 208 Introduction to English Composition and Literary Analysis (3) EXCI 202 The Body Human: Form and Function (3) EXCI 204 Food for Sport (3) EXCI 206 The Science of Sport (3) EXCI 218 Physical Growth and Maturation (3) FINA 200 Personal Finance (3) GEOG 264 Programming for Environmental Sciences (3) MATH 208 Fundamental Mathematics I (3) MATH 209 Fundamental Mathematics II (3) PHYS 235 Object-Oriented Programming and Applications (3) PHYS 236 Numerical Methods in Physics with Python (3) **Notes**

Present Text calendar	Proposed Text
	INTE courses may only be taken with permission. ESL courses may not be taken for credit to fulfill the ECP Electives requirement for the BSc in Artificial Intelligence .

Rationale:

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 228
Calendar Section Type: Course
Description of Change: AI 228 System Hardware

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 228 System Hardware (4 credits)
	(also listed as SOEN 228)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: MATH 203 or Cegep Mathematics 103, MATH 204 or Cegep Mathematics 105.
Description :	*Description :*
	This course covers the following topics: Boolean Algebra, Digital logic and the design of logic circuits; CPU design; addressing modes; instruction sets and sequencing; design of datapath and control units; memory systems and types; cache memory levels; I/O devices and their interconnection to the CPU; assembly language, and Interrupts.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (2 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 228 or SOEN 228 may not take this course for credit.

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (SOEN 228), with which AI 228 will be cross-listed.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 231
Calendar Section Type: Course
Description of Change: AI 231 Discrete Mathematics

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 231 Discrete Mathematics (3 credits)
	(also listed as COEN 231)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: MATH 204 or Cegep Mathematics 105.
Description :	*Description :*
	This course covers the following topics: fundamentals of logic(basic connectives and truth tables); logical equivalence; the laws of logic; logical implication; rules of inference; the use of quantifiers; proofs of theorems; sets (the laws of set theory); Boolean algebra; relation of Boolean algebra to logical and set theoretic operations; modular arithmetic (division algorithm); induction and recursion (induction on natural numbers); recursive definitions; functions and relations (cartesian products and relations); functions; function composition and inverse functions; equivalence relations; elements of graph theory (basic definitions of graph theory; paths, reachability and connectedness; computing paths from their matrix representation; traversing graphs represented as adjacency lists; trees and spanning trees); Finite-state machines (FSM), deterministic and nondeterministic machines; regular languages; FSM with output; and composition of FSM.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (1 hour per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COEN 231 may not take this course for credit.

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (COEN 231),

with which AI 231 will be cross-listed.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 243
Calendar Section Type: Course
Description of Change: AI 243 Programming Methodology

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
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Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 243 Programming Methodology (3.5 credits)
	(also listed as COEN 243)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: MATH 204 or Cegep Mathematics 105.
Description :	*Description :*
	This course is an introduction to computers and programming paradigms. Essential topics from procedural programming languages are discussed such as key elements, reserved words and identifiers, data types and declarations, statements, arithmetic expressions, and different modes of execution. The course covers flow control using If-Else and Switch statements, repetition using loops, recursive functions, pointers, references and dynamic data structures and function pointer. The course material also includes Lambda expression, data structures, built-in arrays, template arrays and vectors, n-dimensional vectors, sorting and searching. Students learn object-oriented programming, user-defined classes, class attributes and methods, object creation, use and destruction. Students are also introduced to exception handling and UML class diagrams.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (2 hours per week) ; Laboratory (12 hours total)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COEN 243 may not take this course for credit.
Anti-requisite Courses :	**Anti-requisite Courses :** Students who have received credit for COMP 248 or MIAE 215 may not take this course for credit.

Rationale:

This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (COEN 243), with which AI 243 will be cross-listed.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 249
Calendar Section Type: Course
Description of Change: AI 249 Object-Oriented Programming

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 249 Object-Oriented Programming (3.5 credits)
	(also listed as COMP 249)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 243 or COEN 243 or COMP 248 ; MATH 203 or Cegep Mathematics 103 or NYA. The following courses must be completed previously or concurrently: MATH 205 or Cegep Mathematics 203 or NYB.
Description :	*Description :*
	This course provides a comprehensive introduction to object-oriented programming (OOP), focusing on the design, efficiency, and implementation of software using OOP principles. Key topics include inheritance, polymorphism, exception handling, recursion, and dynamic data structures such as linked lists and array lists. Students explore collections and generics, learning how to develop flexible and reusable code. Through hands-on programming assignments and projects, students gain experience in designing modular, maintainable, and scalable software solutions.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (2 hours per week) ; Laboratory (1.5 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 249 may not take this course for credit.

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (COMP 249), with which AI 249 will be cross-listed.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 290
Calendar Section Type: Course
Description of Change: AI 290 Introductory AI Engineering Team Design Project - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 290 Introductory AI Engineering Team Design Project (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 249 .
Description :	*Description :*
	The introductory team design project course walks students through the process of designing, developing, and deploying a simple machine learning system. The course puts a strong emphasis on teamwork, project planning and management, design, and professional technical communication. Working in teams, students deliver an end-to-end machine learning prototype that integrates data preparation, model development, model evaluation, deployment, and inference. Students also learn how to use popular machine learning tools and libraries. Teams present their designs and final demonstrations in a competition that is held at the end of term.
Component(s):	*Component(s):*
	Lecture ; Laboratory
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 300
Calendar Section Type: Course
Description of Change: AI 300 Mathematics for AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 300 Mathematics for AI (3 credits)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 231 or COEN 231 , AI 249 or COMP 249 .
Description :	*Description :*
	This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence (AI) and Machine Learning (ML), with an emphasis on implementation. Students develop core mathematics and programming skills to learn numerical and tensor libraries for expressing linear algebra operations and high-performance tensor computations. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue / Singular Value Decomposition (SVD) intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance/correlation, entropy, and Kullback-Leibler (KL) divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train / validation / test methodology, performance metrics, model development, and experiment tracking tools.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (1 hour per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and the B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 330
Calendar Section Type: Course
Description of Change: AI 330 Applied Machine Learning

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 330 Applied Machine Learning (3 credits)
	(also listed as COEN 330)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 249 or COMP 249 ; ENGR 371 .
Description :	*Description :*
	This course on Machine Learning provides a foundation in the principles, algorithms, and applications of machine learning with data-driven best engineering practice. The course introduces students to the concept of machine learning. Students delve into supervised learning algorithms, including linear regression, logistic regression, k-Nearest Neighbors (k-NN), Support Vector Machines (SVM), decision trees, and random forests. The course also covers unsupervised learning models, focusing on various clustering algorithms. Students are introduced to Machine Learning Operations (MLOps) and explore the ethical considerations in machine learning. The course showcases practical applications of machine learning within the field of electrical and computer engineering.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COEN 330 may not take this course for credit.

Rationale:

This is a core course in the B.Eng. in AI Engineering. An AI subject code is being assigned for an existing course (COEN 330), with which AI 330 will be cross-listed.

Note: COEN 244 is listed as an alternative prerequisite for COEN 330 (the cross-listed course) because AI 330 is cross-listed with COEN 330.

COEN 244 is the prerequisite for Computer Engineering students who take COEN 330; AI 249 is the prerequisite for AI Engineering student who take AI 249. We are not including COEN 244 as an alternative prerequisite for AI 330 to avoid confusing the distinct prerequisite streams.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 333
Calendar Section Type: Course
Description of Change: AI 333 Big Data Analytics

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
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Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 333 Big Data Analytics (4 credits)
	(also listed as SOEN 471)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 352 or COEN 352 or COMP 352 .
Description :	*Description :*
	This course focuses on the fundamentals of the big data terminology, concepts and technologies. For the technical aspects of big data management systems, the course focuses on big data engines, programming models and file systems. Specific techniques covered include supervised classification, recommender systems, data clustering, frequent item sets mining, similarity search, data streams and graph analysis. A project provides extensive hands-on experience.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for SOEN 471 may not take this course for credit.

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (SOEN 471), with which AI 333 will be cross-listed.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 334
Calendar Section Type: Course
Description of Change: AI 334 Deep Learning

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 334 Deep Learning (4 credits)
	(also listed as COMP 433)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 330 or COEN 330 or AI 332 or COMP 332.
Description :	*Description :*
	This course introduces conceptual and practical aspects of deep learning and their implementation in software. Topics covered include commonly used deep learning model architectures, loss functions, regularization, optimization methods, and a strong emphasis is placed on review of their foundations and use of software tools such as pytorch, jax, and tensorflow to implement and/or apply these models. Applications in computer vision and natural language processing are covered. A final project is required.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 433 may not take this course for credit.

Rationale:

This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (COMP 433), with which AI 334 will be cross-listed.

Note: The tag for COMP 332 (new course being proposed in dossier GCS-COMP-5982) must be added later.

Note: Although COMP 352 is the prerequisite for equivalent course COMP 433, we are not listing COMP 352 as an alternative prerequisite (for students who may transfer from Computer Science) to keep the prerequisite stream clear for AI students.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 335
Calendar Section Type: Course
Description of Change: AI 335 Reinforcement Learning - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
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Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 335 Reinforcement Learning (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 330 or AI 332 , AI 334 .
Description :	*Description :* This course introduces reinforcement learning (RL), an active and rapidly developing subfield of machine learning. Reinforcement learning focuses on the design of computational agents that learn to predict and make decisions in complex, uncertain and dynamic environments based on experience. Applications include classical control problems such as power plant optimization and dynamical system control, as well as game playing, inventory management, and other domains. The field has also produced influential models of animal and human learning. This course provides a solid introduction to the filed of reinforcement learning and students learn both the fundamental concepts and advanced topics of RL, including Markov Decision Processes (MDPs), dynamic programming, and policy iteration. The course also covers value-based methods such as Deep Q-Networks (DQN), policy-based methods including policy gradient andactor critic algorithms, as well as model-based reinforcement learning. In addition, students explore how RL techniques are applied in modern computer vision and AI applications. The many possible ethical risks of reinforcement learning are covered. To deepen the understanding, the course includes hands-on project and implementations using Python/PyTorch.
Component(s):	*Component(s):* Lecture (2.5 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:

This is a core course in the B.Eng. in AI Engineering and the B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 340
Calendar Section Type: Course
Description of Change: AI 340 Generative Artificial Intelligence - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
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Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 340 Generative Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 334 .
Description :	*Description :*
	This course provides a comprehensive overview of modern generative artificial intelligence (AI) models and techniques. Students study the theoretical foundations and practical implementations of the most popular generative models, including classical probabilistic models, variational autoencoders, generative adversarial networks, energy-based models, diffusion models, normalizing flows, autoregressive models, and large language models. Advanced topics include multimodal generative models and an overview of the most recent scientific articles in the field. The many possible ethical risks of generative artificial intelligence are covered. Through lectures, assignments, and a course project, students develop the ability to analyze, implement, and critically evaluate generative AI systems.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and the B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 345
Calendar Section Type: Course
Description of Change: AI 345 Agentic AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
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Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 345 Agentic AI (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 340 .
Description :	*Description :*
	This course introduces the principles, architectures, and engineering practices of Agentic Artificial Intelligence -- AI systems capable of autonomous perception, reasoning, planning, and action. Students learn how modern agentic systems extend large language models with memory, tools, planning, and collaboration mechanisms to solve complex tasks. The course emphasizes conceptual foundations, engineering design of agent systems, and hands-on development using Python. In addition, the course covers the ethical aspects and responsible use of Agentic AI such as ethical foundations, societal impact, transparency, accountability, safety, security and data and privacy governance . Applications include intelligent assistants, autonomous decision systems, robotics, digital twins, and smart-city infrastructure. A project is required.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and the B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 346
Calendar Section Type: Course
Description of Change: AI 346 Operating Systems

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 346 Operating Systems (4 credits)
	(also listed as COMP 346)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 228 or COMP 228 or SOEN 228 , AI 352 or COEN 352 or COMP 352 .
Description :	*Description :*
	This course covers the following topics: Fundamentals of operating system functionalities, design and implementation; multiprogramming (processes and threads, context switching, queuing models and scheduling); interprocess communication and synchronization; principles of concurrency; synchronization primitives; deadlock detection and recovery, prevention and avoidance schemes; memory management; device management; file systems; and protection models and schemes.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (1 hour per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COEN 346 or COMP 346 may not take this course for credit.

Rationale:

This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (COMP 346), with which AI 346 will be cross-listed.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 350
Calendar Section Type: Course
Description of Change: AI 350 Computer Architecture for AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
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Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 350 Computer Architecture for Artificial Intelligence (3 credits)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 228 or COMP 228 or SOEN 228 , AI 300 , AI 330 or AI 332 .
Description :	*Description :*
	This course introduces the hardware principles that influence the execution of AI workloads. Students learn how machine learning computations map onto modern hardware platforms such as central processing units (CPUs), graphics processing units (GPUs), and AI accelerators. Topics include parallel processing, memory hierarchies, data movement, numerical precision formats, and performance considerations for large-scale AI models. The course helps students understand the capabilities and limitations of computing platforms used to train and deploy AI systems.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 352
Calendar Section Type: Course
Description of Change: AI 352 Data Structures and Algorithms

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
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Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 352 Data Structures and Algorithms (3 credits)
	(also listed as COEN 352)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 231 or COEN 231 , AI 249 or COMP 249 .
Description :	*Description :*
	This covers covers the following topics: mathematical introduction (mathematical induction, program analysis, and algorithm complexity); fundamental data structures (lists, stacks, queues, and trees); fundamental algorithms (hashing and sorting); graph structures and algorithms; overview of algorithm design techniques, including greedy algorithms, divide and conquer strategies, recursive and backtracking algorithms, and heuristics; application of data structures and algorithms to engineering.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Tutorial (1 hour per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COEN 352 may not take this course for credit.
Anti-requisite Courses :	**Anti-requisite Courses :** Students who have received credit for COMP 352 may not take this course for credit.

Rationale:

This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (COEN 352), with which AI 352 will be cross-listed.

Note: COEN 244 is listed as a prerequisite for COEN 352 (the cross-listed course). COEN 244 is the prerequisite for Computer Engineering students who take COEN 330; AI 249 is the prerequisite for AI Engineering students, who take AI 249. We are not including COEN 244 as an alternative prerequisite for AI 352 to avoid confusing the distinct prerequisite streams.

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 370
Calendar Section Type: Course
Description of Change: AI 370 AI System Design - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 370 Artificial Intelligence System Design (3 credits)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 330 or AI 332 or COEN 330 , AI 334 .
Description :	*Description :*
	This course focuses on the design, deployment, and maintenance of end-to-end AI systems. Moving beyond model-centric perspectives, it examines how machine learning components interact with data pipelines, software infrastructure, and operational constraints in real-world applications. Topics include problem formulation, data collection and annotation, evaluation metrics, system and model optimization, deployment on cloud and edge platforms, monitoring and lifecycle management, Machine Learning Operations (MLOps), and issues of ethics, security, and sustainability. This course also covers system-level trade-offs among accuracy, efficiency, cost, robustness, and energy consumption.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 380
Calendar Section Type: Course
Description of Change: AI 380 Trustworthy and Safe AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 380 Trustworthy and Safe Artificial Intelligence (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 330 or AI 332 or COEN 330 . The following course must be completed previously or concurrently: AI 370 .
Description :	*Description :*
	This course introduces foundational principles and engineering methodologies for developing trustworthy and safe Artificial Intelligence (AI) systems. Students examine trustworthiness and safety principles for AI systems, explainability and interpretability, fairness and bias, transparency and accountability, social value alignment, and AI risk management frameworks. The course also explores the adversarial landscape for AI systems, including adversarial AI threats, model and content provenance, and AI-driven misinformation and disinformation. Through technical methods and practical examples, students learn how to evaluate, analyze, and improve the trustworthiness and safety properties of AI systems across application domains.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 390
Calendar Section Type: Course
Description of Change: AI 390 AI Engineering Design Project - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 390 Artificial Intelligence Engineering Design Project (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 290 .
Description :	*Description :*
	Students work in teams to design and implement an artificial intelligence project from requirements provided by the coordinator. Each team demonstrates the software and the testing of the software, and prepares adequate documentation for it. In addition, each team generates a report based on the process of development.
Component(s):	*Component(s):*
	Lecture
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 392
Calendar Section Type: Course
Description of Change: AI 392 AI and Society - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 392 Artificial Intelligence and Society (3 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: ENCS 282 .
Description :	*Description :*
	This course introduces students to the broader societal contexts that shape and are shaped by artificial intelligence (AI). Students learn to view AI as part of larger social, economic, and environmental systems that influence how AI technology is developed and deployed, and how engineers can respond to these challenging questions in responsible and ethical ways. Students learn about transparency, privacy, ethics, human rights, AI policies, regulations and governance. Students also learn to apply responsible innovation frameworks and the human rights AI impact assessment on case studies.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. AI 392 will be taken as part of the Engineering Core in the B.Eng. in AI Engineering (replacing ENGR 392), and in the AI Core in the B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 401
Calendar Section Type: Course
Description of Change: AI 401 Edge AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 401 Edge Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 330 or AI 332 , AI 350 .
Description :	*Description :* This course provides a comprehensive study of deploying Artificial Intelligence (AI) and Machine Learning (ML) models on resource-constrained embedded systems and edge devices. It examines the challenges imposed by tight power, memory, and computational budgets, and introduces key model optimization techniques such as weight clustering, low-rank adaptation, and pruning. The course also covers efficient neural network architectures for edge inference and deployment frameworks for both microcontroller-based and GPU-based edge platforms. Through a combination of foundational TinyML concepts and broader system-level perspectives from modern Edge AI concepts, students gain hands-on experience deploying and evaluating AI models on industry-standard platforms such as ARM Cortex-M microcontrollers or NVIDIA Jetson devices. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 411
Calendar Section Type: Course
Description of Change: AI 411 AI Hardware Accelerators - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 411 Artificial Intelligence Hardware Accelerators (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 330 or AI 332 , AI 350 .
Description :	*Description :* This course provides an in-depth study of hardware architectures and systems designed to efficiently accelerate Deep Neural Networks (DNNs) and modern AI workloads. Students examine the computational, memory, and energy challenges posed by large-scale models, including data movement bottlenecks and the memory wall. Topics include accelerator architectures and dataflow optimizations, hardware-aware model compression techniques (quantization, pruning, sparsity), and case studies of industrial platforms such as Google TPU, NVIDIA NVDLA, and emerging AI accelerators. The course also covers distributed machine learning systems and hardware–software co-design approaches that reduce computation and communication costs. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 412
Calendar Section Type: Course
Description of Change: AI 412 AI for Wearable Health Applications - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 412 Artificial Intelligence for Wearable Health Applications (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 330 or AI 332 .
Description :	*Description :* This course introduces students to the design, development, and evaluation of artificial intelligence systems for health applications using wearable and large-scale sensor data. The course covers data acquisition, signal processing, feature engineering, machine learning, deep learning, large language models, and multimodal systems, with emphasis on clinical validation, ethical deployment, and personalized health monitoring.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 415
Calendar Section Type: Course
Description of Change: AI 415 Hardware Security for AI Systems - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 415 Hardware Security for Artificial Intelligence Systems (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 330 or AI 332 , AI 334 , AI 350 .
Description :	*Description :* This course provides a comprehensive introduction to cybersecurity principles with a focus on hardware security in AI-enabled systems. It covers the hardware foundations of modern AI platforms, including GPUs, TPUs, and specialized AI accelerators, and examines fundamental hardware security primitives. Students analyze threat models and attack surfaces specific to AI hardware, including hardware Trojans, supply chain vulnerabilities, side-channel attacks, and fault injection techniques. The course also explores trust mechanisms for AI devices, memory security, data protection strategies, and trusted execution environments for AI workloads. Emphasis is placed on hardware-aware defenses, secure AI accelerator design, and hardware–software co-design approaches to resilient system development. Emerging challenges and future research directions in securing next-generation AI hardware platforms are also discussed.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 421
Calendar Section Type: Course
Description of Change: AI 421 Cloud Vector Database Systems for AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 421 Cloud Vector Database Systems for Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 330 or AI 332 , AI 352 .
Description :	*Description :*
	Vector databases (VDBs) have become a foundational component of modern AI systems, driven by the widespread use of large language models. Unlike traditional databases, VDBs are designed for high-dimensional similarity search and approximate query processing, prioritizing retrieval efficiency over strict transactional guarantees. This course presents a system-level and practical study of vector databases, covering embedding models and vector representations, similarity metrics, exact and approximate nearest neighbor search (ANNS), and vector query processing. Core indexing and retrieval techniques include inverted file indexing (IVF), graph-based ANN search (HNSW), product quantization (PQ), and hybrid approaches such as IVF-PQ and HNSW-PQ. The course also examines cloud and distributed V-DBMS architectures and the integration of VDBs with Large Language Models (LLMs) through Retrieval-Augmented Generation (RAG). A project is required.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 424
Calendar Section Type: Course
Description of Change: AI 424 Optimization for Machine Learning - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 424 Optimization for Machine Learning (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 300 .
Description :	*Description :* This course covers the following topics: the constrained optimization problem for machine learning; Pareto optimality; Karush-Kuhn-Tucker (KKT) conditions for optimality; gradient descent, Newton's, and interior point algorithms; Lagrange duality; data statistics and pre-processing; applications to predictive analytics using time-series models, regression, and classification using neural networks, and support vector machines; and applications to k-means clustering using Lloyd's algorithm. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 425
Calendar Section Type: Course
Description of Change: AI 425 Resilient AI in Safety-Critical Applications - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 425 Resilient Artificial Intelligence in Safety-Critical Applications (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 380 .
Description :	*Description :* This course provides an in-depth study of principles and technologies for designing and operating resilient Artificial Intelligence (AI) systems in safety-critical applications. Students examine the reliability, robustness, and security challenges posed by AI components integrated into domains such as industrial control, autonomous driving, smart grids, robotics, and other critical systems and services. The course focuses on resilience by design and resilience in operation against unintentional faults, misconfigurations, model drifts, data loss, hardware errors, network failures, and system-level disruptions. Topics include resilience engineering principles, AI failure modes, resilience metrics, architectural redundancy, fault injection and evaluation, reliability-aware model development, runtime monitoring, anomaly detection, adaptive mitigation, AI resilience in real-time and embedded systems, verification and validation, and safety standards and certifications for AI-integrated components and systems. Case studies from industrial safety-critical domains and recent research literature are integrated. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 431
Calendar Section Type: Course
Description of Change: AI 431 Cloud AI and Distributed Machine Learning - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 431 Cloud AI and Distributed Machine Learning (4 credits)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 330 or AI 332 , AI 333 and AI 370 .
Description :	*Description :*
	This course introduces the foundations and practice of cloud-based artificial intelligence and distributed machine learning. Students learn how modern AI workloads are trained, deployed, and managed across cloud and distributed computing platforms. Topics include cloud computing fundamentals, virtualization and containers, distributed data processing, parallel and distributed model training, model serving, orchestration, scalability, reliability, and security/privacy issues in cloud AI systems. The course includes hands-on work with contemporary cloud and Machine Learning tools .
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 432
Calendar Section Type: Course
Description of Change: AI 432 Robot Learning - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 432 Robot Learning (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 300 , AI 330 or AI 332 .
Description :	*Description :* This course introduces the principles and methodologies that enable robots to learn from interaction, data, and demonstrations. Topics include Markov Decision Processes, imitation learning, reinforcement learning, actor–critic and policy gradient methods, optimal control, deep model-based Robot Learning, inverse reinforcement learning, intrinsic motivation, robot simulation and sim-to-real transfer, and emerging vision- and language-based robot learning techniques. The course also integrates visual learning approaches for robot decision-making, including generative models and representation learning, reflecting the growing role of multimodal foundations in robotics. A term project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 434
Calendar Section Type: Course
Description of Change: AI 434 Distributed Learning - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 434 Distributed Learning (4 credits)
	(also listed as COMP 434)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 334 .
Description :	*Description :*
	This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods are also studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students engage critically with current research through regular readings and presentations of recent papers. A final project is also required.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 434 may not take this course for credit.

Rationale:

This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for a new course

(COMP 434) being proposed in another dossier (GCS-COMP-5982), with which AI 434 will be cross-listed.

[Note: Tag for COMP 434 must be added after COMP 434 has been created.]

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 436
Calendar Section Type: Course
Description of Change: AI 436 Deep Learning for Computational Pathology - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 436 Deep Learning for Computational Pathology (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 334 .
Description :	*Description :* This course introduces deep learning in computational pathology, covering theory and practical experience. It includes diagnostic pathology and clinical applications, detailed exploration of digital pathology with high-resolution Whole Slide Image (WSI) acquisition, revisiting foundational deep learning principles, data gathering with domain expertise, preprocessing of WSIs, representation learning models from examining robustly supervised to minimally supervised tasks. Special topics in computational pathology will be emphasized on inductive bias, Object-Oriented Design (OOD), privacy-preserving learning, and foundational modelling. The course also delves into Computer-Aided Diagnosis (CAD) system development for clinical deployment and related challenges. Labs provide hands-on experience where students gain insights applicable to computational modeling of digital pathology images. Project is required.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 441
Calendar Section Type: Course
Description of Change: AI 441 MLOps: Machine Learning Operations - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 441 MLOps: Machine Learning Operations (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 370 .
Description :	*Description :* Machine Learning Operations (MLOps) focuses on the deployment, monitoring, and management of machine learning models in production environments. This course covers end-to-end model lifecycle operations, including Continuous Integration/Continuous Deployment (CI/CD) pipelines, versioning, model governance, and infrastructure automation using orchestration frameworks such as Docker and Kubernetes. Students learn how to design reproducible machine learning workflows, implement automated training and deployment pipelines, manage data and model versioning, and monitor model performance, drift, and reliability in real-world systems. The course emphasizes scalable architectures, testing strategies for ML systems and ethical model governance. Through a hands-on project, students build and deploy production-ready machine learning services, gaining practical experience with experiment tracking, containerization, API deployment, cloud-based infrastructure, and performance monitoring. By the end of the course, students are able to operationalize machine learning models efficiently, ensuring robustness, scalability, and maintainability in dynamic production environments.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 442
Calendar Section Type: Course
Description of Change: AI 442 Explainable AI Engineering Process and Validation - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 442 Explainable Artificial Intelligence Engineering Process and Validation (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 330 or AI 332 , AI 370 .
Description :	*Description :* This course provides an in-depth study of Explainable Artificial Intelligence (XAI) as a system-level engineering discipline within AI-intensive software systems. Students examine how explainability capabilities are designed, integrated, tested, validated, deployed, and monitored across the AI system lifecycle. The course emphasizes engineering processes, system invariants, testing frameworks, quantitative validation methodologies, performance profiling, computing cost estimation, and sustainability monitoring in cloud-native environments. Topics include explainability-by-design system patterns, architectural and system invariants, reproducibility and traceability engineering, testing strategies for XAI pipelines, quantitative explanation validation (fidelity and stability), performance benchmarking, multi-objective trade-off analysis, and sustainability-aware AI system governance. An engineering project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 443
Calendar Section Type: Course
Description of Change: AI 443 Embodied AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 443 Embodied Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 334 .
Description :	*Description :* This course introduces the principles and modern practice of Embodied AI, where intelligent agents perceive, reason, and act in physical or simulated environments. Using a simulation-first workflow, the course surveys core task settings (e.g., navigation, manipulation, and interaction) and the benchmarks and metrics used to evaluate embodied systems. Students learn how sensing and geometry (cameras, coordinate frames, proprioception, and basic sensor fusion) support spatial understanding, and how agents build and use representations such as occupancy maps, point clouds, scene graphs, and memory under partial observability. The course then develops learning-based decision-making foundations through reinforcement learning and imitation learning, before moving to current trends, including vision-language grounding, vision language model (VLM)-based planning with tool use, and vision-language-action (VLA) models for instruction-conditioned control. Finally, students study world models for prediction and planning (including video-based prediction and latent dynamics with imagination rollouts) and deployment-oriented topics such as runtime monitoring, reliability, observability, and failure analysis. By the end of the course, students are able to design and evaluate embodied agents, integrate perception and representation with learning and planning, and implement basic VLM/VLA- and world-model-enabled pipelines with robust evaluation and diagnostics.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:

This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 449
Calendar Section Type: Course
Description of Change: AI 449 Machine Learning Theory - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 449 Machine Learning Theory (4 credits)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 334 .
Description :	*Description :*
	This course introduces students to some fundamental concepts and techniques at the mathematical foundations of machine learning (ML). Students learn how to apply simple but reasonable approximations of complex high-dimensional models to obtain deep insights into non-trivial phenomena like neural scaling laws, multiple descent, and model collapse. The course also highlights open research problems.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:
See proposal and budget.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 454
Calendar Section Type: Course
Description of Change: AI 454 Quantum Machine Learning - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 454 Quantum Machine Learning (4 credits)
Prerequisites:	*Prerequisites:* The following courses must be completed previously: AI 300 , AI 330 or AI 332 .
Description :	*Description :* As classical computing approaches its physical limits, a new frontier of computation is emerging. This course provides a formal introduction to the intersection of quantum information theory and machine learning. Students rigorously examine the geometry of quantum states, the complexity of quantum kernels, and the theoretical speedups offered by quantum algorithms. T opics include the quantum circuit model, quantum feature mapping, and quantum optimization. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 459
Calendar Section Type: Course
Description of Change: AI 459 AI for Media and Content Delivery Networks - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 459 Artificial Intelligence for Media and Content Delivery Networks (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 330 or AI 336 .
Description :	*Description :* The course introduces the key concepts involved with AI-driven networked multimedia systems. Topics include concepts of generating, delivering, and consuming multimedia content. The course explores and covers data-driven techniques and artificial intelligence optimizations (such as deep reinforcement learning, (un)supervised learning and machine learning) that improve the performance, efficiency, and robustness of networking and multimedia system applications. The course introduces the theory and principles in coding, packaging, and securing multimedia data, with a focus on methods for reliable and scalable transport over IP networks for video streaming applications such as: one-way streaming (i.e., video-on-demand and live streaming), two-ways streaming (i.e., video conferencing), and 3D volumetric streaming applications. The course discusses best practices in network and operating system support for media delivery, and the state-of-the-art in current deployments. Additionally, special topics on Large Language Models (LLM) serving for networking and multimedia systems, reinforcement learning-guided video streaming, Machine Learning (ML)-based video telephony, Neural volumetric media compression and delivery, AI-enabled Internet protocols for media delivery, ML-based congestion control, AI for next-generation networks and technologies, ML in resource-constrained environments, video analytics, green ML-based communication. A project is required.

Present Text calendar	Proposed Text
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:

This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 469
Calendar Section Type: Course
Description of Change: AI 469 Conversational AI - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 469 Conversational Artificial Intelligence (4 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 330 or AI 332 .
Description :	*Description :* This course introduces key concepts related to Conversational AI, covering both theoretical and practical aspects. The lectures provide a general overview of modern conversational AI systems. The review covers basic machine learning concepts used in Conversational AI, including speech processing techniques. The course addresses Large Language Models and Multimodal Large Language Models which are an essential part of modern conversational AI methods. The lectures are designed to provide a complete overview of the field of Conversational AI. A project is required.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*

Rationale:
This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 470
Calendar Section Type: Course
Description of Change: AI 470 Engineering AI-Based Software Systems - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 470 Engineering Artificial Intelligence-Based Software Systems (4 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :* This course introduces key concepts related to the engineering of AI-based software systems. Topics include requirements and architectures of AI-based software systems, data validation and management, model selection, quality assurance, deployment and continuous delivery of AI-based software systems. Additionally, special topics on interpreting and monitoring models, and operations in large-scale AI based system are included. A course project involving a real-world open-source AI-based software system is required.
Component(s):	*Component(s):* Lecture (3 hours per week)
Notes :	*Notes :*

Rationale:

This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI.

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 472
Calendar Section Type: Course
Description of Change: AI 472 Generative AI for Software Engineering

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 472 Generative Artificial Intelligence for Software Engineering (4 credits)
	(also listed as SOEN 472)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 370 .
Description :	*Description :*
	This course introduces key concepts about using Generative AI (GenAI) in software engineering practice and research. The course includes sessions on the topics of prompt engineering and fine-tuning Large Language Models for software engineering research. Subsequently, the course focuses on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, the course covers special topics related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of GenAI. A project is required.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for SOEN 472 may not take this course for credit.

Rationale:

This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for a course that is being proposed in another dossier (SOEN 472), with which AI 472 will be cross-listed.

[Note: A tag must be added for SOEN 472 once that course is approved. Dossier ID: GCS-COMP-5982.]

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 474
Calendar Section Type: Course
Description of Change: AI 474 AI-Driven Software Improvement and Repair

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 474 AI-Driven Software Improvement and Repair (4 credits)
	(also listed as SOEN 474)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 370 .
Description :	*Description :*
	This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for SOEN 474 may not take this course for credit.

Rationale:

This is a technical elective course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for a course that is being proposed in another dossier (SOEN 474), with which AI 474 will be cross-listed.

[Note: A tag must be added for SOEN 474 once that course is approved. Dossier ID: GCS-COMP-5982.]

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 487
Calendar Section Type: Course
Description of Change: AI 487 AI and ML in Cybersecurity

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 487 Artificial Intelligence and Machine Learning in Cybersecurity (3 credits)
	(also listed as INSE 487)
Prerequisites:	*Prerequisites:*
	The following courses must be completed previously: AI 300 .
Description :	*Description :*
	The course introduces students to advanced topics of artificial intelligence and machine learning (AI/ML) in cybersecurity, including threats, risks, and mitigations for secure and trustworthy AI/ML deployment as well as threats, risks, and mitigation against adversarial AI/ML like DeepFake and others targeting security, privacy, and other applications. In addition, the course covers the ethical aspects and responsible use of AI and machine learning in cybersecurity such as ethical foundations, societal impact, transparency, accountability, safety, security and data and privacy governance.
Component(s):	*Component(s):*
	Lecture (3 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for INSE 487 may not take this course for credit.

Rationale:
This is a core course in the B.Eng. in AI Engineering and B.Sc. in AI. An AI subject code is being assigned for an existing course (INSE 487), with which AI 487 will be cross-listed.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BEng in Artificial Intelligence Engineering - NEW

Calendar Section Name: AI 490
Calendar Section Type: Course
Description of Change: AI 490 Capstone AI Engineering Design Project - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 490 Capstone Artificial Intelligence Engineering Design Project (6 credits)
Prerequisites:	*Prerequisites:* The following course must be completed previously: AI 390 . Students must have completed 75 credits in the program before enrolling.
Description :	*Description :* Students work in teams of at least four members over two consecutive terms (8 months) to design, develop, deploy, and evaluate a substantial AI-enabled software system for a real client or stakeholder. Projects are based on authentic problem contexts and involve direct interaction with external stakeholders, iterative feedback from end users, and evolving requirements. The system must integrate Artificial Intelligence (AI) components as a central element of its functionality. AI components may include machine learning models, large language models, predictive analytics, intelligent decision systems, or other advanced data-driven techniques. Students may develop, adapt, fine-tune, or responsibly integrate existing AI models within a production-quality software system. Teams are expected to carry out the full software engineering lifecycle, including stakeholder engagement, requirements elicitation and refinement, system and software architecture design, AI model evaluation and validation, risk management, testing, deployment planning, and maintenance considerations. Emphasis is placed on scalability, robustness, security, privacy, ethical considerations, and responsible AI practices in real-world settings. Regular milestone reviews, client presentations, and technical demonstrations are required. Each team member must present their individual contributions and participate in system validation activities, including demonstrating system performance and gathering and incorporating stakeholder feedback.

Present Text calendar	Proposed Text
Component(s):	*Component(s):* Lecture ; Laboratory
Notes :	*Notes :*

Rationale:

This is a core course in the B.Eng. in AI Engineering.

Resource Implications:

Impact Report

Defined Groups

AI Electives - description of requirements
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) -> Degree Requirements -> BEng in Artificial Intelligence Engineering
Source of Impact

AI Engineering Core
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) -> Degree Requirements -> BEng in Artificial Intelligence Engineering
Source of Impact

AI Hardware and Intelligent Systems (elective group)
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) -> Degree Requirements -> BEng in Artificial Intelligence Engineering -> Artificial Intelligence Engineering Electives
Source of Impact

AI Software (elective group)
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) -> Degree Requirements -> BEng in Artificial Intelligence Engineering -> Artificial Intelligence Engineering Electives
Source of Impact

Cybersecurity for AI (elective group)
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) -> Degree Requirements -> BEng in Artificial Intelligence Engineering -> Artificial Intelligence Engineering Electives
Source of Impact

Engineering and Natural Science Group
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.1 Course Requirements (BEng in Artificial Intelligence) -> Degree Requirements -> BEng in Artificial Intelligence Engineering
Source of Impact

Courses

AI 228 System Hardware
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 231 Discrete Mathematics

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 243 Programming Methodology
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 249 Object-Oriented Programming
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 290 Introductory AI Engineering Team Design Project - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 300 Mathematics for AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 330 Applied Machine Learning
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 333 Big Data Analytics
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 334 Deep Learning
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 335 Reinforcement Learning - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 340 Generative Artificial Intelligence - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses

Source of Impact

AI 345 Agentic AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 346 Operating Systems
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 350 Computer Architecture for AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 352 Data Structures and Algorithms
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 370 AI System Design - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 380 Trustworthy and Safe AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 390 AI Engineering Design Project - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 392 AI and Society - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 401 Edge AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 411 AI Hardware Accelerators - NEW

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 412 AI for Wearable Health Applications - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 415 Hardware Security for AI Systems - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 421 Cloud Vector Database Systems for AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 424 Optimization for Machine Learning - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 425 Resilient AI in Safety-Critical Applications - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 431 Cloud AI and Distributed Machine Learning - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 432 Robot Learning - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 434 Distributed Learning - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 436 Deep Learning for Computational Pathology - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses

Source of Impact

AI 441 MLOps: Machine Learning Operations - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 442 Explainable AI Engineering Process and Validation - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 443 Embodied AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 449 Machine Learning Theory - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 454 Quantum Machine Learning - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 459 AI for Media and Content Delivery Networks - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 469 Conversational AI - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 470 Engineering AI-Based Software Systems - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 472 Generative AI for Software Engineering
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 474 AI-Driven Software Improvement and Repair

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 487 AI and ML in Cybersecurity
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 490 Capstone AI Engineering Design Project - NEW
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

Other Units

Addition of **Engineering Core** to **BEng in Artificial Intelligence Engineering** requirement
Source of other unit Impact

- Defined group is housed in Section 71.20 BEng

Addition of **ENGR 245** to **Engineering and Natural Science Group: Artificial Intelligence Engineering** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **MIAE 221** to **Engineering and Natural Science Group: Artificial Intelligence Engineering** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **Engineering Core** to **Degree Requirements** requirement
Source of other unit Impact

- Defined group is housed in Section 71.20 BEng

Addition of **MATH 203** to **AI 228** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 204** to **AI 228** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **COMP 228** to **AI 228** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 228** to **AI 228** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **MATH 204** to **AI 231** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **COEN 231** to **AI 231** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **MATH 204** to **AI 243** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **COMP 248** to **AI 243** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 243** to **AI 243** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **MIAE 215** to **AI 243** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **MATH 203** to **AI 249** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 205** to **AI 249** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **COMP 248** to **AI 249** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 249** to **AI 249** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 243** to **AI 249** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 249** to **AI 300** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 231** to **AI 300** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 249** to **AI 330** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **ENGR 371** to **AI 330** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COEN 330** to **AI 330** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 352** to **AI 333** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 471** to **AI 333** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 352** to **AI 333** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 433** to **AI 334** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 330** to **AI 334** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 228** to **AI 346** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 346** to **AI 346** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 352** to **AI 346** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 228** to **AI 346** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 346** to **AI 346** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COEN 352** to **AI 346** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 228** to **AI 350** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 228** to **AI 350** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 249** to **AI 352** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 352** to **AI 352** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 231** to **AI 352** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COEN 352** to **AI 352** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COEN 330** to **AI 370** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COEN 330** to **AI 380** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENCS 282** to **AI 392** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **INSE 487** to **AI 487** requirement
Source of other unit Impact

- Course is housed in Section 71.100 Concordia Institute for Information Systems Engineering

Addition of **Section 13.3 Admission Requirements** to **Notes** requirement
Source of other unit Impact

- Heading is housed in Admission Regulations

Addition of **Section 13.8 Selection Process and Notification** to **Notes** requirement
Source of other unit Impact

- Heading is housed in Admission Regulations

Addition of **Section 71.20.2 Alternative Entry Programs** to **BEng in Artificial Intelligence Engineering Extended Credit Program** requirement
Source of other unit Impact

- Heading is housed in Section 71.20 BEng

Addition of **Extended Credit Program** to **BEng in Artificial Intelligence Engineering Extended Credit Program** requirement
Source of other unit Impact

- Defined group is housed in Section 71.20 BEng

Addition of **MATH 203** to **BSc in Artificial Intelligence Extended Credit Program** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 204** to **BSc in Artificial Intelligence Extended Credit Program** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 205** to **BSc in Artificial Intelligence Extended Credit Program** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **General Education Humanities and Social Sciences Electives** to **BSc in Artificial Intelligence Extended Credit Program** requirement
Source of other unit Impact

- Defined group is housed in Section 71.110 Complementary Studies for Engineering and Computer Science Students

Addition of **Section 71.110 Complementary Studies for Engineering and Computer Science Students** to **BSc in Artificial Intelligence Extended Credit Program** requirement
Source of other unit Impact

- Sub Section is housed in Section 71.110 Complementary Studies for Engineering and Computer Science Students

Addition of **English as a Second Language Courses** to **BSc in Artificial Intelligence Extended Credit Program** requirement
Source of other unit Impact

- Heading is housed in Section 31.090 Department of Education

Addition of **BIOL 200** to **Artificial Intelligence ECP Electives Exclusion List** requirement

Source of other unit Impact

- Course is housed in Section 31.030 Department of Biology

Addition of **GEOG 264** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.130 Department of Geography, Planning and Environment

Addition of **PHYS 235** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.230 Department of Physics

Addition of **PHYS 236** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.230 Department of Physics

Addition of **EXCI 202** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.120 Department of Health, Kinesiology, and Applied Physiology

Addition of **EXCI 204** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.120 Department of Health, Kinesiology, and Applied Physiology

Addition of **EXCI 206** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.120 Department of Health, Kinesiology, and Applied Physiology

Addition of **EXCI 218** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.120 Department of Health, Kinesiology, and Applied Physiology

Addition of **MATH 208** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 209** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **COMP 218** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **FINA 200** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 61.70 Department of Finance

Addition of **BTM 200** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 61.50 Department of Supply Chain and Business Technology Management

Addition of **BTM 380** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 61.50 Department of Supply Chain and Business Technology Management

Addition of **BTM 382** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 61.50 Department of Supply Chain and Business Technology Management

Addition of **ENGL 206** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.100 Department of English

Addition of **ENGL 207** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.100 Department of English

Addition of **ENGL 208** to **Artificial Intelligence ECP Electives Exclusion List** requirement
Source of other unit Impact

- Course is housed in Section 31.100 Department of English

Section 71.106.1 Course Requirements (BEng in Artificial Intelligence)

Degree Requirements

The BEng in Artificial Intelligence Engineering consists of the Engineering Core, the Artificial Intelligence Engineering Core, Engineering and Natural Science Group: Artificial Intelligence Engineering, and Artificial Intelligence Engineering Electives as shown below. The minimum length of the program is 120 credits.

BEng in Artificial Intelligence Engineering (120 credits)

27.5 credits from the Engineering Core

68.5 credits from the Artificial Intelligence Engineering Core

3.0 credits from Engineering and Natural Science Group: Artificial Intelligence Engineering

19.5 credits from Artificial Intelligence Engineering Electives

Artificial Intelligence Engineering Core (68.5 credits)

- AI 228 System Hardware (4.00)
- AI 231 Discrete Mathematics (3.00)
- AI 243 Programming Methodology (3.00)
- AI 249 Object-Oriented Programming (3.50)
- AI 290 Introductory AI Engineering Team Design Project (3.00)
- AI 300 Mathematics for AI (3.00)
- AI 330 Machine Learning (3.00)
- AI 333 Big Data Analytics (4.00)
- AI 334 Deep Learning (4.00)
- AI 335 Reinforcement Learning (4.00)
- AI 340 Generative Artificial Intelligence (4.00)
- AI 345 Agentic AI (3.00)
- AI 346 Operating Systems (4.00)
- AI 350 Computer Architecture for Artificial Intelligence (3.00)
- AI 352 Data Structures and Algorithms (3.00)
- AI 370 Artificial Intelligence System Design (3.00)
- AI 380 Trustworthy and Safe Artificial Intelligence (3.00)

- AI 390 Artificial Intelligence Engineering Design Project (3.00)
- AI 487 Artificial Intelligence and Machine Learning in Cybersecurity (3.00)
- AI 490 Capstone Artificial Intelligence Engineering Design Project (6.00)

Engineering and Natural Science Group: Artificial Intelligence Engineering (3 credits)

Students must complete 3 credits from the following:

- ENGR 245 Mechanical Analysis (3.00)
- MIAE 211 Mechanical Engineering Drawing (3.50)

Artificial Intelligence Engineering Electives (19.5 credits)

Students must complete 19.5 credits from the Artificial Intelligence Electives listed below. Courses are listed in groups to indicate areas of specialization:

AI Hardware and Intelligent Systems Electives (BEng)

AI Software Electives (BEng)

Cybersecurity for AI Electives (BEng)

General AI Technical Electives (BEng)

- AI 431 Cloud AI and Distributed Machine Learning (4.00)
- AI 432 Robot Learning (4.00)
- AI 454 Quantum Machine Learning (4.00)

AI Hardware and Intelligent Systems Electives (BEng)

- AI 401 Edge Artificial Intelligence (4.00)
- AI 411 Artificial Intelligence Hardware Accelerators (4.00)
- AI 412 Artificial Intelligence for Wearable Health Applications (4.00)
- AI 421 Cloud Vector Database Systems for Artificial Intelligence (4.00)
- AI 424 Optimization for Machine Learning (4.00)
- AI 441 MLOps: Machine Learning Operations (4.00)
- AI 442 Explainable Artificial Intelligence Engineering Process and Validation (4.00)
- AI 443 Embodied Artificial Intelligence (4.00)

AI Software Electives (BEng)

- AI 434 Distributed Learning (4.00)
- AI 436 Deep Learning for Computational Pathology (4.00)
- AI 449 Machine Learning Theory (4.00)
- AI 459 Artificial Intelligence for Media and Content Delivery Networks (4.00)
- AI 469 Conversational Artificial Intelligence (4.00)
- AI 470 Engineering Artificial Intelligence-Based Software Systems (4.00)
- AI 472 Generative Artificial Intelligence for Software Engineering (4.00)
- AI 474 AI-Driven Software Improvement and Repair (4.00)

Cybersecurity for AI Electives (BEng)

- AI 415 Hardware Security for Artificial Intelligence Systems (4.00)
- AI 425 Resilient Artificial Intelligence in Safety-Critical Applications (4.00)

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Appendix 1: Official Program Description

Artificial Intelligence Engineering is concerned with engineering science and design principles related to the development, deployment, and operation of intelligent systems capable of learning from data, making decisions, and interacting with complex environments. Its focus includes ensuring the reliability, robustness, fairness, transparency, and safety of AI-driven systems across a wide range of applications. As an integral component of contemporary technological advancement, artificial intelligence has emerged as a rapidly expanding field, reflecting its transformative impact on industries and society worldwide. AI engineering design challenges encompass a broad spectrum of complexities, including scaling models from research prototypes to real-world systems, integrating AI with heterogeneous hardware and software platforms, ensuring performance under resource constraints, validating and verifying model behavior, and maintaining trustworthy operation throughout the system lifecycle.

Artificial intelligence engineers are typically trained to serve as designers, developers, analysts, and integrators in both public and private sectors. They contribute to the development, deployment, and maintenance of AI systems across domains such as healthcare, finance, manufacturing, transportation, telecommunications, and public services. Their expertise supports data-driven decision-making and complements the work of domain experts, managers, and executives in leveraging AI technologies effectively and responsibly.

The Artificial Intelligence Engineering curriculum integrates core principles from computer science, mathematics, and engineering with specialized AI topics. It includes foundational engineering courses as well as technical electives that enable students to develop advanced knowledge aligned with their interests and emerging industry needs. These domains include, but are not limited to, machine learning, deep learning, computer vision, AI systems and infrastructure, trustworthy and explainable AI, and AI for cyber-physical systems.

B.Eng. in AI Engineering

Appendix 2:

Course Outlines

AI Core Courses

AI 228 System Hardware (4 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: Please see your class schedule for details

Course Calendar Description:
This course covers the following topics: Boolean Algebra, Digital logic and the design of logic circuits; CPU design; addressing modes; instruction sets and sequencing; design of datapath and control units; memory systems and types; cache memory levels; I/O devices and their interconnection to the CPU; assembly language, and Interrupts.

Components: Lecture 3 hours per week; Tutorial 2 hours per week; Laboratory 2 hours per week

Note: Students who have received credit for COMP 228 or SOEN 228 may not take this course for credit.

Prerequisites: MATH 203 or Cegep Mathematics 103, MATH 204 or Cegep Mathematics 105
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Basic mathematical concepts

Course materials
Required Textbook: N/A
Suggested Textbooks: *Computer Organization and Embedded Systems, 6th edition.* Carl Hamacher, Zvonko Vranesic, Safwat Zaky, and Naraig Manjikian; McGraw-Hill; 2012

In addition to the course web page, the faculty web pages have a wealth of information pertaining to our computer systems and software, which includes simple user guides, and answers to many standard questions. You are encouraged to explore these help pages. Begin your exploration from the URL: http://aits.encs.concordia.ca/helpdesk/faq/faq.php/.

Grading Scheme

Assessment tool	Weight
Midterm examination	35%
Final examination	50%
Labs	15%
Total	100%

Completion of the "Safety 1: From Concept to Culture" course is mandatory for all students. A passing grade in this course is a prerequisite for receiving your final grade in AI 228. The course is available in your Moodle account.

Tentative Course Schedule

Include a week-by-week description of course topics (12-week term). You can include any details you like in the schedule.

Lectures	Book chapters	Suggested questions*
1: Basic structure of computers	Chapter 1	
2: Arithmetic and numbering system	Chapter 9	9.2, 9.4, 9.5, 9.6, 9.13, 9.14, 9.21, 9.22, 9.23, 9.24, 9.31,9.32
3: Boolean algebra and digital logic	Appendix A	A.2-9, 11-17, 19-20, 22-34
4: Instruction set architecture	Chapter 2, Appendix E	2.1-2.23, 2.24-2.33 (optional)
5: Basic processing unit	Chapter 5	5.1-5, 5.9, 5.11-12, 5.14-19, 24-26
6: The memory system	Chapter 8	8.2-13, 8.20-21, 8.25
7: Input / Output	Chapters 3 and 7	7.1-2, 4-10, 13-14, 17, 19, 21

*Suggested questions are for practice. There will not be discussed or answered during the class

Details on assessment tools:

Final exam

The exam is a closed-book exam. The final exam date will be set by the University Administration. The exam will cover material from the entire semester, including lectures, textbook, and tutorials. Passing the final exam is necessary for passing the course. There is no substitution for a missed final exam.

Midterm exam

The exam is a closed-book exam. There is no substitution for a missed exam.

Labs

A total of 3 labs experiments (60%) and one project lab (40%). Complete details about the labs are available on a separate document available on Moodle.

Other information

Include any other relevant information you would like to share with your students here.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3 Knowledge base in a specific domain	Introductory
Problem analysis	PA-1 Problem identification and formulation	Introductory

	PA-2 Modelling PA-3 Problem solving PA-4 Analysis	
Design	DE-1 Define objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Introductory
Use of engineering tools	UET-1 Ability to use appropriate engineering tools and resources	Introductory
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution ITW-3 Initiative and leadership ITW-4 Team dynamics	Introductory

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	**Related Graduate Attribute and Indicator**
Analyze various performance issues using assembly language programs.	PA-1, PA-2, PA-3, PA-4
Practical use of low-level computer design principles using assembly language and logic circuit design.	DE-1, DE-2, DE-3, DE-4
Practical use of assembly language (NASM) for low-level system programming and interaction in a computer hardware laboratory setting.	UET-1
Individual and team work on the design and physical realization of a logic circuit and the use of assembly language for various low-level programming tasks.	ITW-1, ITW-2, ITW-3, ITW-4

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 231 Discrete Mathematics (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
Fundamentals of logic: basic connectives and truth tables; logical equivalence; the laws of logic; logical implication; rules of inference; the use of quantifiers; proofs of theorems. Sets: the laws of set theory. Boolean algebra. Relation of Boolean algebra to logical and set theoretic operations. Modulo arithmetic: division algorithm. Induction and recursion: induction on natural numbers; recursive definitions. Functions and relations: cartesian products and relations; functions; function composition and inverse functions; equivalence relations. Elements of graph theory: basic definitions of graph theory; paths, reachability and connectedness; computing paths from their matrix representation; traversing graphs represented as adjacency lists; trees and spanning trees. Finite-state machines (FSM) deterministic and nondeterministic machines; regular languages; FSM with output; composition of FSM.

Components: Lectures: 3 hours per week. Tutorial: 1 hour per week

Note: Students who have received credit for COEN 231 may not take this course for credit.

Credits: 3 credits
Prerequisites: MATH 204 (Cegep Mathematics 105)
Co-requisites: N/A

Course materials
Required Textbook: *Discrete Mathematics and its Applications,* Rosen, K., McGraw-Hill Education, 8th ed., 2018

Other Open Textbook Resources:

- *Discrete Mathematics: An Open Introduction*
- *Discrete Mathematics* (Levin)
- Additional resources will be posted on the course website as the course progresses.

Grading Scheme

Assessment tool	Weight	Indicator
Assignment 1	5%	KB-1, KB-3
Assignment 2	5%	KB-1, KB-3
Assignment 3	5%	KB-1, KB-3
Assignment 4	5%	KB-1, KB-3
Midterm 1	15%	KB-1, KB-3
Midterm 2	15%	KB-1, KB-3
Final Exam	50%	KB-1, KB-3
Total	100%	

Tentative Course Schedule

1. Binary Arithmetic: Base Conversion, Floating Point Notation: Handout Material (Chapter 1 In Discrete Mathematics, By Giguere And Landsberger)
2. Logic: Propositional Logic, Propositional Equivalence. Chapter 1: 1.1, 1.2, 1.3
3. Logic: Predicates & Quantifiers, Rules of Inference, Introduction to Proofs. Chapter 1: 1.4, 1.5, 1.6, 1.7
4. Set Theory: Sets, Set Operations. Chapter 2: 2.1, 2.2
5. Set Theory: Functions, Sequences and Summations. Chapter 2: 2.3, 2.4
6. Set Theory: Cardinality of Sets, Matrices. Chapter 2: 2.5, 2.6
7. Algorithms: Chapter 3: 3.1
8. Induction: Mathematical Induction. Chapter 5: 5.1, 5.2, 5.3
9. Relations Theory: Relations & Their Properties, Representing Relations, Equivalence, Partial Ordering. Chapter 9: 9.1, 9.3, 9.4, 9.5, 9.6
10. Solving Recurrence relations (chapter 8)
11. Graph Theory: Graphs & Graph Models, Graph Isomorphism, Connectivity, Euler & Hamilton Path. Chapter 10: 10.1, 10.2, 10.3, 10.4, 10.5, 10.7
12. Trees. Chapter 11: 11.1, 11.4, 11.5
13. Finite State Machines. Chapter 13: 13.1, 13.2, 13.3

Details on assessment tools:

Assignments

There will be four assignments that are worth 20% of the total grade. Instructions on will be posted on the Moodle course website. The tentative assignment schedule is as follows:

Assignments	**Posted on**	**Due on**	**Type**
Assignment 1	TBD	TBD	Individual
Assignment 2	TBD	TBD	Individual
Assignment 3	TBD	TBD	Individual
Assignment 4	TBD	TBD	Individual

Midterm Exam

There will be two midterm exams, each is worth 15% of your total grade. The details and Instructions on the exam will be posted on the Moodle course website.

Final exam

There will be one final exam that is worth 50% of your total grade. The details and Instructions on the exam will be posted on the Moodle course website. The exam date will be scheduled by the university.

Other information

Academic Honesty

Violation of the Academic Code of Conduct in any form will be severely dealt with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work. Click on the following link for more information: http://www.concordia.ca/students/academic-integrity.html

Course Expectation

- All course materials will be posted on Moodle: https://moodle.concordia.ca/. Please ensure your access to Moodle and contact help@concordia.ca for any technical problems.
- Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.
- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students shall be familiar with the Code of Rights & Responsibilities: http://rights.concordia.ca
- If you cannot attend class for any reason, unforeseen or not, you are to come and talk or write to me as soon as possible.
- Please note that you are responsible for ensuring appropriate, properly functioning technologies (webcam, microphone, Chrome browser, ability to download the required software, as well as a reliable internet connection with a minimum of a 3G connection).
- Please note that all live sessions (such as live lectures, live tutorials, etc.) will be **recorded**, including any questions that you asked during the sessions. You may use the Chat function or email offline to ask questions privately, if you do not wish to be recorded.
- Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the Academic Code of Conduct and/or the Code of Rights and Responsibilities.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of knowledge	CLO	Evaluation method
KB - A knowledge base for engineering	KB-1. Knowledge base of mathematics	Intermediate	1, 2, 3, 4	Assignments and exams
	KB-3. Knowledge base in a specific domain	Intermediate	5, 6, 7	

Course Learning Outcomes (CLOs):
Upon successful completion of the course, students will be able to:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Use logical notation to model and reason about fundamental mathematical concepts such as sets, relations, functions, and integers.	KB-1
2. Evaluate elementary mathematical arguments and identify fallacious reasoning.	KB-1
3. Understand the notion of mathematical thinking, and mathematical proofs, and be able to apply them in problem solving.	KB-1
4. Synthesize induction hypotheses and simple induction proofs.	KB-1
5. Apply graph theory models to solve practical problems of engineering importance.	KB-3
6. Understand and apply finite state machines in modeling computation.	KB-3

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 243 Programming Methodology (3.5 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Labs: Please see your class schedule and lab guidelines for details

Course Calendar Description:
This course is an introduction to computers and programming paradigms. Essential topics from procedural programming languages are discussed such as key elements, reserved words and identifiers, data types and declarations, statements, arithmetic expressions, and different modes of execution. The course covers flow control using If-Else and Switch statements, repetition using loops, recursive functions, pointers, references and dynamic data structures and function pointer. The course material also includes Lambda expression, data structures, built-in arrays, template arrays and vectors, n-dimensional vectors, sorting and searching. Students learn object-oriented programming, user-defined classes, class attributes and methods, object creation, use and destruction. Students are also introduced to exception handling and UML class diagrams.

Components: Lecture 3 hours per week; Tutorial 2 hours per week; Laboratory 12 hours total

Prerequisites: MATH 204 (Cegep Mathematics 105)
Co-requisites: N/A

Course materials
Required Textbook: *C++ How to Program, 10th ed.*, Paul Deitel and Harvey Deitel, Pearson

Other references

- Text book's publisher online resources: http://www.deitel.com/Books/C/CHowtoProgram10e/tabid/3678/Default.aspx
- Additional resources such as Internet links will be posted on the course website as the course progresses

Grading Scheme

Assessment tool	**Weight**
Assignment 1 (individual)	4 %
Assignment 2 (individual)	4 %
Assignment 3 (group)	5 %
Assignment 4 (group)	5 %
Project (group)	7 %
Labs	15 % (5*3%)
Midterm exam	20 %
Final exam	40 %
Total	100 %

Tentative Course Schedule

Week	Topic	Reference
1	Course description	Course Outline
	Introduction to computers and C++	Chapter 1
2	Input and output operators	Chapter 2
	Control statements: 'if' and 'switch'	Chapter 4
3	Repetition with 'while' and 'do-while,' and 'for'	Chapter 4
	Logic operators	Chapter 5
4	Practice exercises – Problem analysis skills	Notes
	Functions	Chapter 6
5	Functions (cont.) and introduction to recursion	Chapter 6
	Practice exercises	Notes
6	Introduction to arrays	Chapter 7
	Class templates array and vector	Chapter 7
7	Midterm Exam	
	Multidimensional arrays and Practice exercises	Chapter 7
8	Introduction to object-oriented programming	Chapter 3
	Introduction to classes and objects	Chapter 3
9	Classes and objects: A deeper look	Chapter 9
	Pointers and references	Chapter 8
10	Pointers and references (cont.)	Chapter 8
	Practice exercises	Notes
11	Introduction to exception handling	Chapter 17
	Introduction to input/output streams	Chapter 13
12	Searching and sorting	Chapter 20
	Review session	All chapters

Lab Details
Please see the lab schedule and lab guidelines (available on Moodle) for details.

Engineering Tools
IDEs that support C++ Programming

Details on assessment tools:

Assignments
There will be four assignments and one project that are worth 25% of the total grade. Instructions on how to package and submit the assignments and project will be posted on the course website. The assignments and project schedules are as follows:

Assignments	Posted on	Due on
Assignment 1 (individual)	TBD	TBD
Assignment 2 (individual)	TBD	TBD
Assignment 3 (group)	TBD	TBD
Assignment 4 (group)	TBD	TBD

Note:

- There is no late submission policy. Late submissions will not be graded.
- For group assignments, you can only have a partner who is enrolled in the same section. You cannot have a partner from a different section.
- Group size: Two (2) students maximum. Groups of 3+ students will not be accepted.

Labs

The labs component accounts for 15% of the overall course grade. The purpose of the labs is to help you be better programmers and develop the skills required to program to specifications. During the lab you will be asked to write the program that produces specific outputs and behaviour.

There will be 6 lab exercises to be completed (Lab 1 to 6). These exercises can only be done during the specified lab period you are registered for and must be submitted at the end of your lab period. The best 5 of 6 grades will be considered (3% for each). Lab topic for each lab will be posted on your course web page the week before. You must attend the lab section you are registered for. **There are no make-up labs.**

Notes:

- The grade for a lab will be zero (0) or maximum for that lab. There will not be an intermediate grade.
  Students need to attend at least 3 out of 6 labs to pass the lab portion of course.
- Lab manual with more details is available on the course webpage.

Midterm Exam

There will be one midterm exam that is worth 20% of your total grade.

Final Exam

There will be one final exam that is worth 40% of your total grade.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning	CLO
A knowledge base for engineering	KB-3 Knowledge base in a specific domain	Introductory	1, 3, 4
Problem analysis	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving PA-4. Analysis (uncertainty and incomplete knowledge)	Introductory	4, 5, 6

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Define the principles of computer-based problem solving and programming	KB-3 Knowledge base in a specific domain
Describe programming concepts and language constructs in C++	KB-3 Knowledge base in a specific domain
Apply C++ concepts including control statement, repetition statement, arrays, classes and objects, pointers, and references	PA-1 Program identification and formulation PA-3 Problem solving
Demonstrate skills in debugging and testing existing C++ programs with the objective of finding faults and improving code quality	PA-1 Program identification and formulation PA-3 Problem solving PA-4 Analysis
Analyze problems using the problem analysis techniques described in the course	PA-3 Problem solving PA-4 Analysis
Demonstrate proficiency in implementing C++ solutions using proper C++ language constructs	PA-1 Program identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 249 Object-Oriented Programming (3.5 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
This course provides a comprehensive introduction to object-oriented programming (OOP), focusing on the design, efficiency, and implementation of software using OOP principles. Key topics include inheritance, polymorphism, exception handling, recursion, and dynamic data structures such as linked lists and array lists. Students explore collections and generics, learning how to develop flexible and reusable code. Through hands-on programming assignments and projects, students gain experience in designing modular, maintainable, and scalable software solutions.

Components: Lecture 3 hours per week; Tutorial 2 hours per week; Laboratory 1.5 hours per week

Prerequisites: AI 243; MATH 203 or Cegep Mathematics 103 or NYA
Co-requisites: MATH 205 or Cegep Mathematics 203 or NYB

Specific Knowledge and Skills Needed for this Course:

- Some previous experience of programming in Java such as that provided in COMP 248 or a similar course. In particular, a good understanding of expressions, statements, methods, parameters, and arrays.
- Knowledge of the basic concepts of objects, classes, and packages.

Course materials
Required Textbook: *Absolute Java* by Walter Savitch, *6th or later*, Addison Wesley

Many resources for the course (slides, assignments, example programs, ...) will be available online.

Grading Scheme

Assessment tool	Weight
Assignments	20%
Midterm exam	25%
Final exam	55%
Total	100 %

Tentative Course Schedule

Week	Chapters	Material
1	4, 5 and 6	Review of Classes, Objects & Arrays
2	7	Inheritance
3	8	Polymorphism and Abstract Classes
4	9	Exception Handling
5	9	Exception Handling

6	10	File I/0 & Serialization
7	11	Recursion
8	13	Interfaces & Inner Classes
9	13	Interfaces & Inner Classes
10	14	Generics
11	15 and 16	Linked Data Structures & Collections
12	17 and 18	Graphical User Interfaces

Details on assessment tools:

Labs

The purpose of the labs are:
1) To provide you with better programming skills, grasp of the course materials, and good preparation for your exams.
2) To assist you with any questions that you might have about your programs and assignments.
3) To conduct lab exercises (please read very carefully): there will be one lab exercise each week during the course. These exercises must be done individually and be submitted during your lab period. To be clear, a lab exercise can only be done during one single lab period (which you are registered into) and must be submitted electronically to the correct lab folder on the Moodle for your section by the end of that lab time.

These lab exercises will not be marked (or only random ones will be selected for marking) and hence may not evaluate to any load of the course. You are required to perform and submit ALL of these lab exercises. Although these lab exercises may not represent any load after all, failing to perform and submit any of them will cost you some significant marks. There is no make-up for a missed lab exercise.

Assignments

There will be 4 to 5 assignments. The assignments will examine the programming materials and subjects covered in class and will allow you to develop a stronger foundation of problem analysis and solving. While all assignments have a programming component; some of them may have a theoretical component as well. You are allowed to work either individually or in a group of two, with another student from the same, or from a different, section. No additional marks are given for working individually. Assignments are to be submitted electronically only - no paper submission. Instructions on submitting assignments will be given in the first assignment. All assignment handouts will be available on the course web pages.

Submission format: For the programming assignments, all assignment-related submissions must be adequately archived in a ZIP file using your ID(s) and last name(s) as file name. The submission itself must also contain your name(s) and student ID(s). Use your “official” name only - no abbreviations or nick names; capitalize the usual “last” name. Inappropriate submissions will be heavily penalized. Students will have to submit their assignments (again, one copy per group for the programming assignments).

Note: For the programming part only, a demo will take place with the markers afterwards. Markers will inform you about the details of demo time and how to book a time slot for your demo. If working in a group, both members must be present during demo time. Different marks may be assigned to teammates based on this demo.

- If you fail to demo, a zero mark is assigned regardless of your submission.
- If you book a demo time, and do not show up, for whatever reason, you will be allowed to reschedule a second demo but a penalty of 50% will be applied.
- Failing to demo at the second appointment will result in zero marks and no more chances will be given under any conditions.

Midterm Exam

The midterm will cover all material presented in the lectures, the textbook, and in the assignments and labs, up to and including the lecture preceding the exam. Passing the midterm exam is necessary for passing the course. There is no make-up midterm exam.

Final Exam

There will be one common final exam for all sections. The final examination will be administered during the examination period at the end of the term. The final examination covers all material seen during the term, and will examine your developed skills of problem analysis, in addition to your programming knowledge of the subjects covered during the entire course.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Description
A knowledge base for engineering	KB-3 Knowledge base in a specific domain	Knowledge of advanced concepts in object-oriented programming, including classes, inheritance, polymorphism, static and dynamic binding, abstract classes, exception handling, file I/O, recursion, interfaces and inner classes. Basic knowledge of the design and implementation of graphical user interfaces, generic programming, collections and iterators
Design	DE-3. Detailed design DE-4. Validation and implementation	Determine appropriate classes and their relationships, data structures, abstractions, use of external libraries in order to design a maintainable and extensible solution that meets the identified specifications and constraints using an object-oriented programming language.
Use of engineering tools	UET-1 Ability to use appropriate tools, techniques and resources	Determine what appropriate syntactical constructs, data structures, libraries and abstractions to use to solve relatively complex programming problems in order to meet the problem's identified specifications and constraints.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to be able to do the following:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator

1. Write more modular, robust and flexible Java programs by building on the knowledge acquired in COMP 243.	KB-3, UET-1
2. Design and implement Java programs which: • Include a hierarchy of classes (inheritance, polymorphism and abstract classes, inner classes and interfaces • Include generic classes • Deal with unexpected situations (exception handling) • Read and/or write data to/from a file • Use Collections and make use of tools that allow you cycle through all elements of a collection (iterators) • Use data structure classes which are available in Java libraries such as Array Lists, Linked Lists, Hash Tables, Trees and Sets to name a few	DE-3, DE-4
3. Design and implement: • Methods that call themselves (recursions) • Graphical user interfaces (GUIs)	DE-3, DE-4, UET-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 290 Introductory AI Engineering Team Design Project (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
The introductory team design project course walks students through the process of designing, developing, and deploying a simple machine learning system. The course puts a strong emphasis on teamwork, project planning and management, design, and professional technical communication. Working in teams, students deliver an end-to-end machine learning prototype that integrates data preparation, model development, model evaluation, deployment, and inference. Students also learn how to use popular machine learning tools and libraries. Teams present their designs and final demonstrations in a competition that is held at the end of term.

Prerequisites: AI 249
Co-requisites: N/A

Topics:

- Project management concepts
- Machine learning system life cycle concepts
- Data visualization
- Data preparation
- Model design and evaluation
- Model deployment and inference
- Responsible AI principles

Grading Scheme
The final grade for the course will be determined based on the following assessment tools and weights.

Assessment Tool	Weight
Data visualization	10%
Data preparation	10%
Model design and evaluation	15%
Model deployment and inference	10%
Teamwork and collaborative project development	10%
Ethical aspects	10%
Final Demo	20%
Final Report	15%
Total	100%

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Introductory
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate engineering tools, techniques and resources	Introductory
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution – practical / conceptual ITW-3 Initiative and leadership ITW-4 Team dynamics	Intermediate / developed
Communication skills	COM-1 Writing process COM-4 Oral presentation	Intermediate / developed Introductory
Ethics and equity	EE-1 Professional ethics and accountability	Intermediate / developed
Economics and project management	EPM-3 Project planning and implementation	Introductory

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Define and manage project requirements for an applied machine learning engineering project	DE-1, EPM-3
2. Plan and execute a team-based project using basic project management concepts	EPM-3
3. Design, build, evaluate, and deploy an end-to-end machine learning system, from data acquisition and preparation through model development and deployment into a working prototype.	DE-1, DE-2, DE-3, DE-4
4. Learn to use machine learning and development tools and libraries such as scikit-learn and PyCharm.	UET-1, UET-2
5. Demonstrate effective teamwork and professionalism through respectful collaboration and constructive feedback.	ITW-1, ITW-2, ITW-3, ITW-4

6. Understand key ethical aspects of AI by applying responsible AI principles (e.g., fairness, privacy, transparency) to project decisions.	EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 300 Mathematics for AI (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence and Machine Learning, with an emphasis on implementation. Students develop core mathematics and programming skills to learn numerical and tensor libraries for expressing linear algebra operations and high-performance tensor computations. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue/SVD intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance/correlation, entropy, and KL divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train/validation/test methodology, performance metrics, model development, and experiment tracking tools.

Components: Lecture 3 hours per week; Tutorial 1 hour per week

Prerequisites: AI 231, AI 249
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

1. Calculus mathematics
2. Statistics and probabilities
3. Programming skills including object-oriented programming

Course materials
Required Textbook: *Mathematics for Machine Learning*, Deisenroth, M. P., Faisal, A. A., & Ong, C. S., Cambridge University Press, 2020

Course Materials: Students will be provided with course slides and Google Colab tutorials.

Grading Scheme

The final grade for the course will be determined based on the following assessment tools and weights.

Assessment tool	Weight
Midterm Exam	25%
Final Exam	25%
Practice Exam	20%
Theoretical Assignments	15%
Lab Assignments	15%
Total	100%

Tentative Course Schedule

Week	Topic	Description & Key Concepts
1	Introduction to Python for Scientific Computing	Introduction to Python, data structures (lists, tuples, sets, dictionaries), data processing libraries (PIL, Pandas/DataFrame, NLTK), lists of objects, error handling, visualization (Matplotlib), Jupyter notebooks, Python environment management (conda/venv, pip, dependency pinning, GPU/CUDA installation notes).
2-3	Linear Algebra and Tensor Libraries	Basic matrix and tensor multiplications, matrix properties (transpose, orthogonality, rank, determinant, trace, norms, distances), eigenvalues and singular value decomposition (SVD), Principal Component Analysis (PCA), Independent Component Analysis (ICA), matrix inversion, Moore-Penrose Pseudoinverse, implementation using NumPy and PyTorch.
4-5	Gradient Analysis	Single-variable derivatives, single-variable minimization and maximization problems with exercises, taylor expansion, partial derivatives for multivariable functions, differentiation rules, chain rule, gradients and matrix-based views of gradients (Stanford reference), gradient computation demonstrations using PyTorch, Jacobian of a vector, second order derivatives and Hessian analysis, Convexity analysis.
6	Midterm Exam	
7-8	Optimization	Objective functions for minimization, numerical vs analytical optimization, gradient-based optimization, non-stochastic gradient descent, stochastic gradient descent, adaptive optimization methods, second order optimizers, constrained optimization, lagrange multipliers, equality and inequality constraints including KKT conditions, exercises and PyTorch implementations.

9-10	**Probability and Statistics**	Random variable, probability density functions, stochastic moments (e.g, expectation, variance) Gaussian distribution and the Central Limit Theorem, transformations, Kullback–Leibler (KL) divergence, entropy, covariance and correlation, statistical significance and hypothesis testing, Bayes'rule, conditional probability, marginal probability, join probability, Markov chains sampling, exercises and PyTorch implementations.
11-12	**Machine Learning Pipelines**	Numerical Computation, Overflow, underflow, random seeds and reproducibility, data manipulation (e.g, shuffling, normalization, augmentation), introduction to machine learning models, parameters and hyperparameters, training, validation, and test splits, performance metrics, regularization, end-to-end workflows. Exercises and PyTorch implementations.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
A knowledge base for engineering	KB-1 Knowledge base of mathematics	Intermediate / developed
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources	Introductory

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Familiarization and fully understanding the mathematical foundations behind Artificial Intelligence (AI) algorithms and models designs	KB-1
2. Familiarization with popular libraries and toolkits used in machine learning and deep learning	UET-1, UET-2
3. Basic implementation and understanding of machine learning pipelines and how they operate in different downstream applications	PA-1, PA-2, PA-3

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 330 Applied Machine Learning (3 credits)

Note: This course is included only in the B.Eng. in AI Engineering. (The B.Sc. in AI includes AI 332 Foundations of AI and AI 336 Machine Learning instead of AI 330.)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
This course on Machine Learning provides a foundation in the principles, algorithms, and applications of machine learning with data-driven best engineering practice. The course introduces students to the concept of machine learning. Students delve into supervised learning algorithms, including linear regression, logistic regression, k-Nearest Neighbors (k-NN), Support Vector Machines (SVM), decision trees, and random forests. The course also covers unsupervised learning models, focusing on various clustering algorithms. Students are introduced to Machine Learning Operations (MLOps) and explore the ethical considerations in machine learning. The course showcases practical applications of machine learning within the field of electrical and computer engineering.

Components: Lecture 3 hours per week; Tutorial 2 hours per week

Prerequisites: AI 249; ENGR 371
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming and probability and statistics

Course materials
Required Textbook: *Introduction to Machine Learning with Python*, A. Mueller and S. Guido

Useful:
- *Pattern Recognition and Machine Learning* by Christopher M. Bishop
- *Machine Learning: A Bayesian and Optimization Perspective* by Sergios Theodoridis
- *Machine Learning* by Zhi-Hua Zhou

Grading Scheme

Assessment tool	Weight
Assignments (five)	25%
Midterm exam	25%
Final exam	50%
Total	

Tentative Course Schedule

Lecture	Topics
1	Introduction to Machine Learning
2	Data preprocessing (understanding data, data cleaning, data transformation, normalization, standardization, feature engineering and selection)
3	Linear Regression (simple and multiple linear regression, evaluating regression models: MSE, RMSE, R-squared)
4	Classification algorithms (logistic regression, model evaluation and validation)
5	Classification algorithms (KNN, SVM, decision trees, random forest)
6	Classification Algorithms Case Study
	Midterm exam
7	Ensemble Methods (Bootstrap, Bagging, Boosting)
8	Ensemble Methods (cont.)
9	Unsupervised Learning (clustering: k-Means, Hierarchical Clustering, DBSCAN)
10	Unsupervised Learning Case Study
11	Model deployment and operations – Introduction to MLOps
12	Model deployment and operations – Introduction to MLOps (cont.) The ethical aspects of ML.

Engineering Tools

- Python Development Environment (e.g., PyCharm, Jupyter Notebook)
-

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning	CLO
A knowledge base for engineering	KB-3. Knowledge base in a specific domain	Intermediate	1, 2, 3, 4
Problem analysis	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving PA-4. Analysis (uncertainty and incomplete knowledge)	Intermediate	2, 3, 4, 5
Ethics and equity	EE-1 Professional ethics and accountability	Introductory	6

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1 Understand the core principles, terminology, and types of machine learning, including supervised and unsupervised learning.	KB-3
2 Apply algorithms such as linear regression, logistic regression, k-NN, SVM, decision trees, and random forests to solve real-world problems.	PA-1, PA-2, PA-3
3 Explore clustering algorithms and apply them to identify patterns in unlabelled data.	PA-4
4 Develop and manage end-to-end machine learning pipelines, focusing on deployment, version control, and model monitoring.	PA-2
5 Apply machine learning techniques to solve practical challenges within the field of electrical and computer engineering.	PA-3, PA-4
6 Understand the ethical concerns of fairness, bias, privacy, and transparency in machine learning applications.	EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 333 Big Data Analytics (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course focuses on the fundamentals of the big data terminology, concepts and technologies. For the technical aspects of big data management systems, the course focuses on big data engines, programming models and file systems. Specific techniques covered include supervised classification, recommender systems, data clustering, frequent itemsets mining, similarity search, data streams and graph analysis. A project provides extensive hands-on experience.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 352
Co-requisites: N/A

Course materials
Required Textbook: MMDS: *Mining of Massive Datasets, 3rd ed. (beta version)*; J. Leskovec, A. Rajaraman, and J. Ullman

Grading Scheme

Assessment tool	Weight
Lab assignments (3)	15%
Midterm exam	20%
Final exam	40%
Project	25%
Total	100%

Tentative Course Schedule

Week	Lecture topic	Assignment / Lab activities
1	Introduction	None
2	Data locality (Hadoop MapReduce & HDFS)	Even teams: Git/GitHub/Python/pytest Uneven teams: Project Definition Project teams must register
3	In memory computing & lazy evaluation (Apache Spark, Dask)	Uneven teams: Git/GitHub/Python/pytest Even teams: Project Definition
4	Supervised Learning	Even teams: Spark RDDs, DataFrames, intro to LA1 Uneven teams: Data model design
5	Recommender Systems	Uneven teams: Spark RDDs, DataFrames, intro to LA1 Even teams: Data model design
6	Clustering	Even teams: Introduction to LA2 Uneven teams: LA1 (data preparation)
7	Midterm Exam	
8	Frequent Itemsets	Uneven teams: Introduction to LA2

		Even teams: Data preparation
9	Data Streams	Even teams: Introduction to LA3 Uneven teams: Model implementation Project data model due during clinic
10	Graph Analysis	Uneven teams: Introduction to LA3 Even teams: Model implementation Project data model due during clinic
11	Similarity Search	All teams: Help with LA3 Uneven teams: Project presentations
12	Project Presentations	Final project presentations

Engineering Tools
Git, GitHub, Python, pytest, Hadoop, Apache Spark.

Details on assessment tools:
Lab Assignments (15%)
You will be required to develop data analysis programs in Python using Apache Spark or Dask. There will be a total of three assignments. You must work on these assignments individually. Assignments must be submitted through GitHub Classroom, you will receive a link for each assignment.

Exams (60%)
There will be a mid-term and a final exam. All examinations will be closed book and no electronic device will be allowed except ENCS calculators. Exams will be Multiple-Choice Questionnaires. The midterm will be conducted in-class and will count for 20% of the final grade. The final exam will count for 40% of the final grade. There will be no substitution for a missed exam.

Project (25%)
This course will walk you through the definition and implementation of a data-science project using Big Data technologies. During the project clinics and lecture, the instructors will guide you through the following milestones:

1. **Project definition**:
   - Option 1: Own Project. You will define your own project by identifying: (1) a dataset of interest, (2) a set of research questions to be answered with the dataset, using techniques studied in class. If you are doing a Master or PhD thesis, you are encouraged to define a project linked to your research topic.
   - Option 2: Industrial Project. You will select a project proposed by a company through the Riipen platform. Industrial projects will be validated by the instructors.

Both project types are expected to follow the same milestones (described below).Milestones for industrial projects might be slightly revised depending on the exact nature of the projects.

2. Model design: choose a class of models in {supervised learning, recommender system, clustering, frequent itemset}. Outline how the data model could be applied to your dataset to answer your research question. Research algorithms and techniques to implement this class of model.

3. Data preparation: inspect the dataset, identify missing data, outliers, data types (categorical data in particular), and write Spark or Dask programs to correct for potential issues.

4. Model implementation: implement the model with Spark, Dask or scikit-learn.

5. Model evaluation: identify evaluation metrics for your model. Implement and discuss them.

Projects will have the following deliverables. Deadlines are indicated on the schedule. No deadline extension will be granted.

1. Team registration (1%) Easy point! Please register your team of 4 students on time to allow for a smooth organization of project clinics.

2. Participation (3%) Attendance and participation to project clinics. Project clinics will follow the following template:

1. Project team presents updates to class (5')
2. Instructor gives feedback and directions (5'). Audience may ask questions.
3. Feedback on project milestones (3').

Don't miss an opportunity to get feedback on your project!

3. Project summary (3%) The project summary will be a 400-word abstract available as a Markdown (.md) document in a GitHub repository. The summary will report on project definition and model design. It will describe the dataset and its main characteristics (number and type of features), the research questions to be addressed in the project, the class of models to be applied to the dataset, and the algorithms that will be used. At least two algorithms must be used and compared. The project summary will be evaluated during the project clinics (see schedule table).

4. Project data model (10%) The project data model will be delivered as a Jupyter notebook containing code and explanations to implement data preparation, model training and (optional) model evaluation. The project data model will be evaluated during the project clinics (see schedule table).

5. Final project presentation (8%) The project presentation will be delivered during the last week of the course as a 6-10 minute presentation putting special emphasis on model evaluation and summarizing the other project milestones.

Project deliverables will be evaluated using specific rubrics. All criteria will be assessed on a 4-level scale: unacceptable, average, good, excellent.

Note: project team grades may be weighted differently for each participant in case the team judges that some team members have not contributed significantly to the project. Grading Scheme: There is no standard relationship between percentages and letter grades assigned. The grading of the course will be done based on the relative percentages assigned to the assignments, project and the exam. There is no definite rule for translation of number grades to letter grades.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Knowledge base for engineering	KB-1 Knowledge base of mathematics KB-3 Knowledge base in specific domain	Advanced Intermediate / developed
Problem analysis	PA-2 Modelling PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate / developed
Investigation	INV-1 Background and hypothesis formulation INV-2 Designing experiments INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Intermediate / developed
Design	DE-1 Define the objective DE-2 Idea generation and selectin DE-3 Detailed design DE-4 Validation and implementation	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources	Intermediate / developed
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution: practical / conceptual ITW-3 Initiative and leadership ITW-4 Team dynamics	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1.Perform data preparation and data labeling on a dataset prior to its use for consumption by the data analysis.	INV-2
2.Perform supervised and unsupervised learning on the dataset.	INV-3
3.Implement a recommender system based on a dataset.	INV-1, PA-2
4.Use frequent itemsets and similarity search in high-dimensional datasets.	UET-1
5.Use graph analysis to handle highly-connected, high-variety data.	INV-3, INV-4, PA-4, UET-1
6.Use data streaming to deploy solutions for real-time decision-making in high-velocity and high-volume scenarios.	INV-3, UET-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 334 Deep Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces conceptual and practical aspects of deep learning and their implementation in software. Topics covered include commonly used deep learning model architectures, loss functions, regularization, optimization methods, and a strong emphasis is placed on review of their foundations and use of software tools such as pytorch, jax, and tensorflow to implement and/or apply these models. Applications in computer vision and natural language processing are covered. A final project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Linear algebra, multivariate calculus, probability, and algorithms

Course materials
Required textbooks:
- *Deep Learning*, Goodfellow et al., freely available at www.deeplearningbook.org
- *Dive into Deep Learning***,** freely available at http://preview.d2l.ai/d2l-en/master

Some material not in the textbook will be covered with appropriate references

Grading Scheme

Assessment tool	**Weight**
Assignments	30%
Project	30%
Quizzes	30%
Labs	10%
Total	100%

Tentative Course Schedule

Lec 1 - Machine Learning Foundations for Deep Learning
Lec 2 - Introduction to Neural Networks
Lec 3 - Backpropagation
Lec 4 - Automatic Differentiation Software

Lec 5 - Optimization for Deep Learning
Lec 6 - Training Deep Neural Networks in Practice
Lec 7 - Convolutional Neural Networks
Lec 8 - RNNs, Sequence models, Seq2Seq
Lec 9 - Attention and Self-Attention
Lec 10 - Multi-task and Transfer Learning
Lec 11 - Introduction to Deep Generative Models
Lec 12 - Self-Supervised Learning

Details on assessment tools:

Assignments (30%)

- 2 Problem sets will be given throughout the semester.
- The assignments will be programming projects and some paper and pencil problems
- (20% of the assignment).
- Assignments are to be done strictly individually.

Quizzes (30%)

- Quizzes will be given throughout the semester in class (announced well in advance).
- The quizzes will be 30-45 minutes long with multiple-choice and long answers.

Project (30%)

Teams of 2-3 students will work on a project. Students will select from a predefined project or give their own proposal.

Lab (10%)

- Throughout the semester weekly labs will be given and TAs will assist students in doing the lab.
- There will be two phases of labs (graded and ungraded): Lab 2-5 will be graded and comprise the lab grade. The rest of the labs are optional but will count as additional marks.
- The labs will be posted on Moodle along with their submission link and due dates.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
A knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate / developed
Problem analysis	PA-1 Problem identification and formulation	Intermediate / developed
Design	DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Explain the theoretical foundations of deep learning, including neural network architectures, loss functions, optimization algorithms, and regularization techniques.	KB-3
Implement deep learning models using modern software frameworks (PyTorch, JAX, TensorFlow) and apply best practices in model construction, debugging, and training.	UET-1
Apply automatic differentiation tools to compute gradients and analyze computational graphs for deep network training.	UET-1, DE-4
Design and train convolutional neural networks (CNNs) for computer vision tasks.	UET-1, DE-4
Build and evaluate recurrent and sequence-based models (RNNs, LSTMs, GRUs, Seq2Seq) for temporal and sequential data.	UET-1, DE-4
Implement and analyze attention mechanisms and transformer-based architectures, including self-attention, for applications in NLP and related areas.	UET-1, DE-4
Apply transfer learning, multi-task learning, and self-supervised learning techniques to address real-world problems with limited labeled data.	UET-1, DE-4
Develop and present a complete deep learning project involving problem formulation, dataset preparation, model selection, evaluation, and communication of results.	PA-1, DE-2, DE-3, DE-4

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 335 Reinforcement Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces reinforcement learning, an active and rapidly developing subfield of machine learning. Reinforcement learning focuses on the design of computational agents that learn to predict and make decisions in complex, uncertain and dynamic environments based on experience. Applications include classical control problems such as power plant optimization and dynamical system control, as well as game playing, inventory management, and other domains. The field has also produced influential models of animal and human learning. This course provides a solid introduction to the filed of reinforcement learning and students learn both the fundamental concepts and advanced topics of RL, including Markov Decision Processes (MDPs), dynamic programming, and policy iteration. The course also covers value-based methods such as Deep Q-Networks (DQN), policy-based methods including policy gradient and actor critic algorithms, as well as model-based reinforcement learning. In addition, students explore how RL techniques are applied in modern computer vision and AI applications. The many possible ethical risks of reinforcement learning are covered. To deepen the understanding, the course includes hands-on project and implementations using Python/PyTorch.

Components: Lecture 2.5 hours per week; Lab 2 hours per week

Prerequisites: AI 330 or AI 332, AI 334
Co-requisites: N/A

Course materials

Suggested textbooks:

- *Reinforcement learning: An introduction*, 2nd ed.; Richard S. Sutton and Andrew G. Barto; MIT Press; 2019
- *Algorithms for Reinforcement Learning*, Szepesvari

Programming: Python / PyTorch

Lecture notes and other relevant materials will be available on course web page.

Grading Scheme

Assessment tool	Weight
Assignments	20%
Project	30%
Exams	50%
Total	100%

Tentative Course Schedule

Week	Topic
1	Introduction to Reinforcement Learning Ethical risks related to Reinforcement Learning
2	Markov Decision Processes
3	Dynamic Programming
4	Monte Carlo and Temporal Difference Learning
5	Q-Learning
6	DQN and advanced techniques
7	Policy Gradient
8	Actor Critic
9	Advanced Policy Gradient
10	Continuous Controls
11	Imitation Learning
12	Model-based RL

Engineering Tools
Python / PyTorch

Details on assessment tools:
Assignments
Throughout the semester, students complete four assignments done individually. In addition, students will be working on a semester-long project in groups of up to 3 that includes implementing RL algorithms in real word problem domain. The project must be programmed in Python / PyTorch. and may involve the writing of a report or an oral presentation, as well as a demo of the work.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate / developed
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Intermediate / developed
Design	DE-2 Idea generation and selection	Intermediate / developed
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Demonstrate a solid understanding of core reinforcement learning concepts and clearly distinguish reinforcement learning from other machine learning paradigms.	KB-3
2. Model real-world decision-making problems within the reinforcement learning framework, including the formulation of Markov Decision Processes (MDPs).	PA-1, PA-2
3. Understand and implement both value-based approaches (e.g., Q-learning and Deep Q-Networks) and policy-based approaches (e.g., Policy Gradients and Proximal Policy Optimization) for solving discrete and continuous control problems.	PA-3, UET-1, UET-2, UET-3
4. Comprehend more advanced value-based and policy-based reinforcement learning methods and apply them to the design of improved or more sophisticated algorithms.	KB-3, DE-2
5. Evaluate and compare reinforcement learning algorithms using appropriate performance metrics and evaluation criteria.	UET-2, UET-3
6. Analyze the strengths, limitations, and practical applicability of state-of-the-art reinforcement learning algorithms in real-world scenarios.	PA-4, UET-3
7. Demonstrate understanding of the ethics/equity risks involved in Reinforcement Learning and implement risk mitigation strategies / models.	EE-1, EE-2

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 340 Generative AI (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course provides a comprehensive overview of modern generative artificial intelligence models and techniques. Students study the theoretical foundations and practical implementations of the most popular generative models, including classical probabilistic models, variational autoencoders, generative adversarial networks, energy-based models, diffusion models, normalizing flows, autoregressive models, and large language models. Advanced topics include multimodal generative models and an overview of the most recent scientific articles in the field. The many possible ethical risks of generative artificial intelligence are covered. Through lectures, assignments, and a course project, students develop the ability to analyze, implement, and critically evaluate generative AI systems.

Components: Lecture 3 hours/week; Laboratory 1 hr/week

Prerequisites: AI 334
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- **Machine Learning:** Supervised and unsupervised learning principles, loss functions, optimization algorithms, and model evaluation metrics.
- **Deep Learning:** Neural network architectures (MLPs, CNNs, RNNs, Transformers), backpropagation, regularization techniques
- Programming skills including object-oriented programming

Course materials
Required Textbook: *Deep Learning: Foundations and Concepts*; Christopher M. Bishop and Hugh Bishop; Springer, 2024

Students will be provided with course slides and Google Colab tutorials.

Grading Scheme

The final grade for the course will be determined based on the following assessment tools and weights.

Assessment tool	Weight
Midterm Exam	20%
Final Exam	30%
Project	40%
Assignments	10%
Total	100%

Tentative Course Schedule

Week	Topic	Description & Key Concepts
1	Introduction to Generative Models	Course Introduction, Discriminative vs Generative models, Historical evolution, Taxonomy of Generative Models, Evaluation, Failure modes (mode collapse, overfitting, generalization), Ethical risks related to Generative Artificial Intelligence
2	Classical Probabilistic Generative Models	Gaussian Mixture Models, EM algorithm, Hidden Markov Models.
3	Variational Autoencoders	Latent variable generative models, Intractability of exact inference, Variational inference and the ELBO, VAE architecture and training, Limitations.
4	Generative Adversarial Networks	Adversarial learning, minimax games, GAN architectures, training, stability, model collapse
5	Energy-based Models	Energy functions and unnormalized densities, Langevin dynamics, Restricted Boltzmann machines.
6	Diffusion	Denoising intuition, forward and reverse processes, sampling, connection to energy-based models
7	Midterm Exam	
8	Normalizing Flow Models	General idea and intuition, Invertible transformations, Continuous normalizing flows, Flow Matching.
9	Autoregressive Generation	Chain rule factorization of distributions, Autoregressive neural architectures, Examples: PixelRNN, Wavnet, sampling strategies, Strengths and limitations.

10	Large Language Models	Autoregressive text generation, Transformer architecture, Training, Scaling laws, Reinforcement Learning from Human Feedback, Benchmarks
11	Multimodal Large Language Models	Image tokens, Audio Tokens, Native Multimodal LLMs
12	Research and Open Problems	Analyses of recent research papers and discussion of open problems

Engineering Tools
PyTorch for designing Generative AI models

Details on assessment tools:

Project
The project component of this course provides hands-on experience in implementing Generative AI systems.

Project expectations:
- End-to-End Implementation: Design and deploy a functional Generative AI model
- Technical Proficiency: Demonstrate skills in implementing and testing deep neural networks for Generative AI, including the ability to clearly explain the results critically.
- Documentation: Provide professional documentation and a technical description of the Generative AI model implemented.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	**Indicators**	**Level of coverage**
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced / Applied
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling	Advanced / Applied
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Advanced / Applied
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
CLO 1: Implement state-of-the-art generative frameworks, such as VAEs, GANs, Diffusion models, and Autoregressive Transformers, using modern AI libraries and GPU acceleration.	UET-1, UET-2, UET-3
CLO 2: Understand the theoretical principles of generative modelling.	KB-3, PA-1, PA-2
CLO 3: Understand potential and limitations of modern generative AI methods.	UET-3
CLO 4: Demonstrate understanding of the ethics/equity risks involved in Generative Artificial Intelligence and implement risk mitigation strategies/models.	EE-1, EE-2

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 345 Agentic AI (3 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces the principles, architectures, and engineering practices of Agentic Artificial Intelligence -- AI systems capable of autonomous perception, reasoning, planning, and action. Students learn how modern agentic systems extend large language models with memory, tools, planning, and collaboration mechanisms to solve complex tasks. The course emphasizes conceptual foundations, engineering design of agent systems, and hands-on development using Python. In addition, the course covers the ethical aspects and responsible use of Agentic AI such as ethical foundations, societal impact, transparency, accountability, safety, security and data and privacy governance. Applications include intelligent assistants, autonomous decision systems, robotics, digital twins, and smart-city infrastructure. A project is required.

Components: Lecture 3 hours per week; Laboratory 1 hour per week

Prerequisites: AI 340
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine learning: Basic knowledge in AI and machine learning.
- Python programming: Basic python programing skills.
- Data structures and algorithms: understanding basics in data structures and algorithms.

Course materials

- Up-to-date course materials will be provided by the instructor.
- Students will be provided with the following materials to support their learning and laboratory work:
  - Sample projects: sample project tutorials and codes will be provided.
  - Lecture Slides and Lab Manuals: Will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	Weight
Midterm exam	20%
Final exam	45%
Design project	35%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Agentic AI	From generative AI to agentic systems; Definitions of autonomy and agency; Historical perspective on intelligent agents; Application domains **Lab**: Explore a simple LLM agent
2	Foundations: LLMs as Cognitive Engines	Transformer architecture overview; Prompting and reasoning capabilities; Limitations of standalone LLMs; Role of LLMs in agent systems. **Lab**: Prompt engineering experiments
3	Prompt Engineering for Agents	Chain-of-Thought, ReAct, Tree-of-Thought; Role prompting, context management **Lab**: Implement ReAct prompting loop
4	Agent Architectures	Perception → cognition → action loop; Planning modules; Controller architectures; Reactive vs deliberative agents **Lab:** Build a basic agent loop
5	Tool Use and Action Execution	Function calling; API integration; External tools; Environment interaction **Lab:** Tool-using agent
6	Memory and Knowledge Integration	Short-term vs long-term memory; Vector databases Retrieval-Augmented Generation; Knowledge grounding **Lab:** RAG-enabled agent
7	Classical Decision-Making Foundations	Decision theory; Utility functions; Markov Decision Processes; Planning under uncertainty **Lab:** Planning simulation
8	Multi-Agent Systems	Cooperation and coordination; Communication protocols; Task decomposition; Orchestrator agents **Lab:** Multi-agent workflow
9	Agent Engineering Frameworks	Overview of frameworks; Workflow orchestration; Engineering best practices **Lab:** Framework-based agent
10	Human-in-the-Loop and Safe Autonomy	Human oversight; Approval mechanisms; Guardrails; Risk mitigation **Lab**: Human-controlled agent pipeline
11	Evaluation and Deployment	Performance evaluation; Testing agent behavior; Reliability and robustness; Deployment considerations **Lab**: Agent evaluation experiments
12	Ethics, Governance, and Future Directions	Responsible AI; Societal impact; Regulatory considerations; Emerging research directions **Final Project Presentations**

Details on assessment tools:

Course Project

Students design and implement a domain-specific agentic system, such as:

- Autonomous research assistant
- Software engineering agent
- Mobility planner
- Smart-city decision agent

- Digital-twin operator

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3: Knowledge base in specific domain	Advanced / applied
Problem analysis	PA-2 Modelling PA-3 Problem solving	Advanced / applied
Investigation	INV-1 Background and hypothesis formulation INV-2 Designing experiments	Advanced / applied
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Advanced / applied
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Advanced / applied
Ethics and equity	EE-1 Professional ethics and accountability	Advanced / applied

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
CLO 1: Explain core concepts of agentic AI systems.	KB-3
CLO 2: Design agent architectures with perception, memory, planning, and action.	DE-1, DE-2, DE-3, DE-4
CLO 3: Implement agents using modern frameworks.	INV-1, INV-2, UET-1
CLO 4: Integrate external tools and knowledge sources. Develop multi-agent workflows.	PA-2, PA-3, UET-1, UET-2, UET-3
CLO 5: Evaluate performance, reliability, and risks. Apply ethical and safety principles and the general principle of responsive use of AI.	INV-3, INV-4, EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 346 Operating Systems (4 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
This course covers the following topics: Fundamentals of operating system functionalities, design and implementation; multiprogramming (processes and threads, context switching, queuing models and scheduling); interprocess communication and synchronization; principles of concurrency; synchronization primitives; deadlock detection and recovery, prevention and avoidance schemes; memory management; device management; file systems; and protection models and schemes.

Components: Lecture 3 hours per week; Tutorial 1 hour per week; Laboratory 2 hours per week

Prerequisites: AI 228; AI 352
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- The hardware structure of modern computers, the role of the different parts (CPU, main memory, secondary memory, system bus, peripheral devices), the inter-connections between the different parts, and how the different parts interact to support computation, communication, and storage.
- The binary number system, basic arithmetic and logical operations on binary numbers, and converting binary numbers to decimal and vice-versa.
- The hardware-software interface including assembly language programming, accessing registers and main memory from software, I/O instructions, interrupts and interrupt handling, etc.
- Common data structures such as queues, stacks, lists, prioritized lists, etc. Implementation of such data structures using arrays, dynamic arrays, and linked-lists. Evaluation of algorithmic complexity of the operations.
- Fundamentals of operating system functionalities, design and implementation.
- The important skills needed to do well in this course include: 1) good programming skills, including the ability to understand, design, implement, and debug programs with non-obvious flow of control, 2) the ability to understand tradeoffs using a mix of qualitative and quantitative reasoning of design choices, 3) the ability to relate the theoretical material covered in class to the practical aspects of implementation, and 4) the ability to abstract the knowledge learnt and apply it to a wide range of problems (not necessarily related to operating systems, or even computer science for that matter).

Course materials
Required Textbook: *Operating System Concepts, 10th ed.;* Silberschatz/Galvin/Gagne; John Wiley & Sons; 2018.

Other references:

- Operating Systems, 3rd ed. (or 2nd ed.); Gary Nutt, Addison-Wesley.
- Applied Operating System Concepts, 1st ed.; Silberschatz/Galvin/Gagne; John Wiley & Sons, 2000.

Grading Scheme

Assessment tool	Weight
Theoretical assignments (individual)	N/A
Programming assignments	20%
Midterm exam	25%
Final exam	55%
Total	100%

Tentative Course Schedule

Week	Topic
1	Introduction – OS Overview
1 and 2	I/O Systems & OS Structures
3	Processes & Threads
4	Process Synchronization
4 and 5	Process Synchronization
6 to 8	High-Level Synchronization
8 and 9	Memory Management
9 and 10	Virtual Memory
10 and 11	Scheduling
11 and 12	File management and Deadlock

Details on assessment tools:

Programming Assignments: 20%
There will be 3 or 4 programming assignments. These assignments are designed to give you more understanding of the course material and to give you practices into aspects of operating system design and implementation. The assignments are using the Java language under Linux operating system. More information on the specific compiler version as well as where it is located in the system will be provided during lab times. You are allowed to work either individually or in a group of two at most. No additional marks are given for working individually. Reasonable attempts of all these assignments are necessary for passing the course.

Important: A demo will take place with the markers afterwards. Markers will inform you about the details of demo time and how to book a time slot for your demo. If working in a group, both members must be present during demo time. Different marks may be assigned to teammates based on this demo.

Submission format: For the programming assignments, all assignment-related submissions must be adequately archived in a ZIP file using your ID(s) and last name(s) as file name. The submission itself must also contain your name(s) and student ID(s). Use your “official” name only - no abbreviations or nick names; capitalize the usual “last” name. Inappropriate submissions will be heavily penalized. Submit only one copy per group for the programming assignments.

Theoretical Assignments

There will be a total of 3 or 4 theoretical assignments, which must be done individually. These assignments will not be marked (or only selected questions may be marked) and hence may not evaluate to any load of the course. The main purpose behind these assignments is to provide you with good preparation for the final. You are required to submit all of these assignments before the term's last day of classes. Although these assignments may not represent any load after all, failing to submit any of these assignments will cost you some "significant" marks (up to 20 marks). Additionally, these assignments must be typed and submitted online on Moodle Scanned Hand-written assignments will be discarded.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
A knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1.Understand fundamental operating system abstractions such as processes, threads, files, semaphores, inter process communication (IPC) abstractions, shared memory regions, etc.	KB-3
2. Understand how the operating system abstractions can be used in the development of application programs, or to build higher level abstractions and be able to apply these concepts for their practical applications.	DE-1, DE-2
3. Understand how the operating system abstractions can be implemented.	DE-3, DE-4
4. Understand the principles of concurrency and synchronization, and apply them to write correct concurrent programs / software.	DE-1, DE-2, DE-4
5. Understand basic resource management techniques (scheduling or time management, space management) and principles ad how they can be implemented. These also include issues of performance and fairness objectives and avoiding deadlocks.	DE-1, DE-2, DE-4

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 350 Computer Architecture for AI (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the hardware principles that influence the execution of AI workloads. Students learn how machine learning computations map onto modern hardware platforms such as CPUs, GPUs, and AI accelerators. Topics include parallel processing, memory hierarchies, data movement, numerical precision formats, and performance considerations for large-scale AI models. The course helps students understand the capabilities and limitations of computing platforms used to train and deploy AI systems.

Components: Lecture 3 hours per week

Prerequisites: AI 228, AI 300, AI 330 or AI 332
Co-requisites: N/A

Course materials
Required Textbook: *Computer Architecture, A Quantitative Approach, 7th ed.*; John L. Hennessy, David A. Patterson, Christos Kozyrakis; 2025

Grading Scheme

Assessment tool	**Weight**
Assignments	10%
Midterm Exam	35%
Final Exam	55%
Total	100%

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	**Indicators**	**Level of coverage**
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced
Problem analysis	PA-4 Analysis (uncertainty and incomplete knowledge)	Advanced
Investigation	INV-2 Designing experiments INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Advanced
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resource	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
CLO 1: Explain how core computer architecture concepts—such as memory hierarchies, parallel processing, and numerical representation—affect the execution of machine learning workloads.	KB-3
CLO 2: Evaluate performance trade-offs in AI systems by considering factors such as data movement, memory bandwidth, computational throughput, and energy efficiency.	PA-4, INV-4
CLO 3: Interpret architectural features of modern AI hardware (e.g., tensor cores, vector units, specialized accelerators) and explain how they influence model training and inference performance.	INV-4
CLO 4: Apply basic performance analysis techniques to assess the suitability of computing platforms for different AI workloads.	INV-2, INV-3, INV-4, UET-1,

Health and Safety Guidelines
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On Campus Resources
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AI 352 Data Structures and Algorithms (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
Mathematical introduction: mathematical induction, program analysis, and algorithm complexity. Fundamental data structures: lists, stacks, queues, and trees. Fundamental algorithms: hashing and sorting. Graph structures and algorithms. Overview of algorithm design techniques, including greedy algorithms, divide and conquer strategies, recursive and backtracking algorithms, and heuristics. Application of data structures and algorithms to engineering.

Components: Lecture 3 hours per week, Tutorial 1 hour per week

Prerequisites: AI 231, AI 249
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Object oriented programming design and development
- Program debugging and trouble shooting
- Programming comments and software development tools

Course materials
Required Textbook: *Algorithms, 4th ed.;* Robert Sedgewick, Kevin Wayne, Addison-Wesley

Other references:
- Text book's publisher online resources: https://algs4.cs.princeton.edu/home/
- *Data structures and Algorithms in Java* by Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser

Grading Scheme

Assessment tool	Weight
Assignment 1	5%
Assignment 2	5%
Assignment 3	8%
Assignment 4	7%
Midterm exam	20%
Final exam	55%
Total	100%

Tentative Course Schedule

Week	Topic	Reference
1	Course description Analysis of algorithms	Course outline 1.4
2	Analysis of algorithms (cont.) Recursion	1.4 Notes
3	Stacks and Queues	1.3
4	Elementary Sorts	2.1
5	Merge Sort Quick Sort	2.2 2.3
6	Priority Queues & Heap	2.4
7	Midterm Priority Queues & Heap (cont.)	 2.4
8	Symbol Tables Binary Search Trees	3.1 3.2
9	Balanced Search Trees	3.3
10	Hash Tables	3.4
11	Graphs and Graph-based Algorithms	4.1 & 4.2
12	Graphs and Graph-based Algorithms (cont.) Review session	4.3 All chapters

Engineering Tools

- IDEs that support Java Programming

Details on assessment tools:

Assignments

There will be four (4) assignments worth 25% of the total grade. Instructions on how to package and submit the assignments will be posted on the course website. All assignments involve algorithmic design and computer programming. For all programming components of your assignments, you need to use Java. Each assignment covers one or more topics. Submitted assignment solutions that are up to 24 hours late will suffer a 50% deduction; more than that: 100%.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Learn Java and (possibly) the Java Collections library, in order to implement solutions in Java and where appropriate using Java Collections	KB-3
2. Design algorithmic solutions to problems, solutions involving data structure and their manipulation through algorithms	KB-3, PA-1, PA-2, PA-3
3. Faithfully implement these solutions as correct object-oriented programs	PA-1, PA-3
4. Work effectively to create, implement and demonstrate a program solution to an open-ended and challenging problem. Further enhance specific graduate attributes (engineering knowledge, problem analysis and life-long learning) in the context of data structures and algorithms	PA-1, PA-2, PA-3, PA-4

Health and Safety Guidelines
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On Campus Resources
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AI 370 AI System Design (3 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course focuses on the design, deployment, and maintenance of end-to-end AI systems. Moving beyond model-centric perspectives, it examines how machine learning components interact with data pipelines, software infrastructure, and operational constraints in real-world applications. Topics include problem formulation, data collection and annotation, evaluation metrics, system and model optimization, deployment on cloud and edge platforms, monitoring and lifecycle management, MLOps, and issues of ethics, security, and sustainability. This course also covers system-level trade-offs among accuracy, efficiency, cost, robustness, and energy consumption.

Components: Lecture 3 hours per week, Laboratory 1 hour per week

Prerequisites: AI 330 or AI 332, AI 334
Co-requisites: N/A

Grading Scheme

Assessment tool	Weight
Assignments	30%
Exams	30%
Project	40%
Total	100%

Tentative Course Schedule
Week 1: Introduction to AI Systems
Week 2: Problem Formulation and Objective Design
Week 3: Data-Centric AI and Data Optimization
Week 4: Metrics, Evaluation, and System-Level Validation
Week 5: Model Selection and Training Optimization
Week 6: Model Efficiency and Inference Optimization
Week 7: AI System Architecture and Pipeline Optimization
Week 8: Deployment and Serving Optimization
Week 9: Monitoring, Maintenance, and Lifecycle Optimization
Week 10: MLOps and Reproducible Optimization
Week 11: Trustworthy, Secure, and Sustainable AI Systems
Week 12: Case Studies and Emerging Directions

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Problem analysis	PA-1 Problem identification and formulation PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate / developed
Investigation	INV-3 Conducting experiments and collection of data	Intermediate / developed
Design	DE-3 Detailed design DE-4 Validation and implementation	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources	Intermediate / developed
Ethics and equity	EE-1 Professional ethics and accountability	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Formulate AI system objectives and requirements, including constraints related to data, infrastructure, deployment, and performance.	PA-1
Design and critique data collection, annotation, and data-centric optimization pipelines for real-world AI applications.	PA-4
Select and apply appropriate evaluation metrics and system-level validation strategies to assess end-to-end AI system performance.	INV-3
Analyze and implement model training and optimization techniques, balancing accuracy, efficiency, robustness, and cost.	PA-4
Architect complete AI pipelines, integrating data processing, model training, inference components, and system-level optimizations.	DE-3, DE-4
Deploy AI models on cloud, distributed, and edge platforms, considering latency, throughput, scalability, and resource constraints.	UET-1
Implement monitoring, maintenance, and lifecycle management strategies consistent with modern MLOps practices.	UET-1
Evaluate and address ethical, security, trustworthiness, and sustainability considerations in the design and deployment of AI systems.	EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
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On Campus Resources
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AI 380 Trustworthy and Safe AI (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces foundational principles and engineering methodologies for developing trustworthy and safe Artificial Intelligence (AI) systems. Students examine trustworthiness and safety principles for AI systems, explainability and interpretability, fairness and bias, transparency and accountability, social value alignment, and AI risk management frameworks. The course also explores the adversarial landscape for AI systems, including adversarial AI threats, model and content provenance, and AI-driven misinformation and disinformation. Through technical methods and practical examples, students learn how to evaluate, analyze, and improve the trustworthiness and safety properties of AI systems across application domains.

Components: Lecture 3 hours per week

Prerequisite: AI 330 or AI 332
Co-requisite: AI 370

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine Learning Fundamentals: Supervised and unsupervised learning, model training and evaluation, overfitting and regularization.
- Probability and Statistics: Knowledge of random variables, probability distributions, and hypothesis testing.
- Programming Skills: Proficiency in Python and experience with at least one ML framework (e.g., PyTorch).
- Software Engineering Basics: Modular design, debugging, testing, and version control.

Course materials
Recommended Textbooks:
- *Responsible AI: Best practices for creating trustworthy AI systems*; Lu, Q., Zhu, L., Whittle, J., & Xu, X.; Addison-Wesley Professional; 2023.
- *Trustworthy AI: From theory to practice*; Catak, F. O., & Kuzlu, M.; 2024

In addition to the required textbook, students will be provided with the following materials to support their learning:
- Research Papers: A curated list of seminal papers to be posted on the course website.
- Software Tools: PyTorch, scikit-learn, MLflow, Pandas/NumPy/Matplotlib, GitHub
- Lecture Slides: Will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	Weight

Assignments	35%
Midterm Exam	25%
Final Exam	40%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Foundations of Trustworthiness and Safety	Definitions and dimensions of trustworthy AI; safety vs. reliability; socio-technical perspectives; trust in AI systems
2	Trustworthiness and Safety Principles	Robustness, reliability, fairness, transparency, accountability, privacy, and human oversight principles
3	Explainability and Interpretability	Model-specific vs. model-agnostic explanations; feature attribution; local/global explanations; limitations of interpretability methods
4	Fairness and Bias in AI Systems	Sources of bias, fairness metrics, disparate impact, bias detection and mitigation techniques
5	Social Value Alignment	Value alignment problem; human-centric AI; alignment challenges in generative and decision-making systems
6	Transparency and Accountability	Documentation practices; auditability; traceability; accountability mechanisms; human-in-the-loop governance
7	AI Risk Management Frameworks	NIST AI Risk Management Framework: Risk identification and categorization; impact and likelihood assessment; AI lifecycle risk management approaches
8	Adversarial Landscape for AI Systems	Threat models; attack surfaces in ML pipelines; robustness evaluation; system-level implications; MITRE ATLAS knowledge base
9	Adversarial AI Threats	Evasion; poisoning; model extraction; prompt injection; detection and mitigation strategies
10	Model and Content Provenance	Data lineage; model versioning; watermarking; provenance tracking; authenticity verification
11	AI Misinformation and Disinformation	Generative AI risks; Deepfake; AI-based spoofing; synthetic data detection; societal and security implications
12	Practical Case Studies in Trustworthy and Safe AI	Analysis of real-world deployments, governance challenges, lessons learned, and bridging to resilient AI systems

Engineering Tools

- Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:
- PyTorch: Model development, robustness testing, interpretability experiments.
- scikit-learn: Baseline models, fairness evaluation, validation workflows.
- Explainability Libraries (e.g., SHAP, LIME): Feature attribution and model interpretability analysis.
- Fairness Toolkits (e.g., AI Fairness 360): Bias detection and mitigation experiments.

- Adversarial Robustness Libraries (e.g., CleverHans, Foolbox): Evaluation of adversarial vulnerabilities and defences.
- Provenance & Model Management Tools (e.g., MLflow): Tracking model lifecycle.
- Synthetic Media Detection Tools (research toolkits or open-source detectors): Evaluation of misinformation and deepfake content.
- Python Scientific Stack (NumPy, Pandas, Matplotlib): Statistical analysis and visualization

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced
Problem analysis	PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Advanced
Investigation	INV-4 Analysis and interpretation of data	Advanced
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources	Advanced
Professionalism	PR-2 Professional practice	Intermediate
Impact of engineering on society and the environment	IES-1 Awareness of society and environment impact	Advanced
Ethics and equity	EE-1 Professional ethics and accountability	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1: Explain and differentiate key dimensions of trustworthy and safe AI, including fairness, transparency, accountability, robustness, and value alignment	KB-3
2: Analyze and quantify bias, uncertainty, explainability, and risk in AI systems using appropriate computational and statistical techniques	PA-3, PA-4, UET-1, UET-2
3: Evaluate AI systems against adversarial threats and misinformation risks and assess mitigation strategies	PA-3, INV-4
4: Apply AI risk management frameworks and provenance mechanisms to support transparency and accountability across the AI lifecycle	PA-3, INV-4, EE-1
5: Assess real-world AI deployments and articulate engineering trade-offs among performance, safety, trustworthiness, and societal impact	IES-1, PR-2

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
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On Campus Resources
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AI 390 AI Engineering Design Project (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
Students work in teams to design and implement an artificial intelligence project from requirements provided by the coordinator. Each team demonstrates the software and the testing of the software, and prepare adequate documentation for it. In addition, each team generates a report based on the process of development.

Prerequisites: AI 290
Co-requisites: N/A

Grading Scheme

Assessment tool	Weight
Release 1	20%
Release 2	30%
Release 3	30%
Completed project requirements	20%
Total	100%

Iterations	Expected deliverables and marking scheme	Weight
Release 1 (~ weeks) Sprint #1 Sprint #2	▪ Repository setup and Continuous Integration (You should setup a GitHub repository and GitHub actions that automate your test executions.): 1 point ▪ User Stories Backlog (You should create user stories for ALL project requirements. Before the beginning of each Sprint you will plan the user stories to be completed and estimate their user story points using planning poker): 3 points ▪ Agile Planning (Each release consists of 2 Sprints and each Sprint is 2-weeks long. For each Sprint you will include the Sprint summary and burndown chart. You will use GitHub Projects for planning): 1 point ▪ Retrospectives: (Include retrospectives for each Sprint. All actions in the retrospective should be justified based on the “lessons learned” from the previous sprints): 1 point ▪ Software Architecture (Domain Model, Component Diagram, analysis of external libraries that will be used with a justification about their pros and cons): 3 points ▪ UI Prototypes (Create mockups for each user story planned in the Sprint, all mockups will be annotated to explain the functionality of buttons/inputs/outputs, Persona descriptions, UI variations based on the personas, show updates to the UI mockups after receiving feedback from the product owner): 3 points Unit/System Testing Report (Unit test coverage report for the current release, Research about automating end-2-end tests: 2 points	20%

	▪ Pull Requests and Code reviewing (All features will be contributed in the form of pull requests. Each pull request will have assigned code reviewers and discussions between the reviewers and authors about potential improvements related to code/design quality): 2 points ▪ Code Quality and Security Report (Software metrics evolution, report the technical debt, security vulnerabilities, and code convention violations for the current release): 2 points ▪ Presentation to the Instructor (the content of the presentation will be announced before the release): 2 points	
Suggested Plan for Sprint #1 Setup your GitHub repository and yml scripts for GitHub workflows 1. Organize your GitHub Wiki according to the sections listed in the provided template 2. Create your project Backlog in GitHub Projects (make user stories and acceptance criteria for ALL project requirements) 3. Define the personas representing potential users and describe some of the tasks they will perform on the system. You should consider how to make your software accessible to more people. People with disabilities (color-blind, blind, deaf, people with hand injuries), illiterate people, or marginalized people. 4. Create UI mockups for the user stories you will implement in Sprint 2 and get feedback from your product owner. 5. Think about and document the design of your app (basic domain model, component diagram). Explore external libraries/frameworks that might be useful for your project and discuss their pros and cons. 6. Plan your Sprint 2 in GitHub Projects by adding some user stories from your backlog (add features than can be completed within 2 weeks) 7. Conduct and document your Sprint 1 Retrospective. Meet with your product owner and get feedback for your mockups and your backlog.		
Suggested Plan for Sprint #2 1. Implement the planned features for Sprint 2 2. Write unit tests for your code 3. Submit your feature implementations as Pull Requests. Assign team members for code review. There should be active discussions and suggestions for improvements. 4. Create UI mockups for the user stories you will implement in Sprint 3 and get feedback from your product owner. 5. Investigate how you can make automated System/UI tests. Try to implement at least one end-2-end test for a completed user story. 6. Install and run SonarQube for your project. Summarize the issues detected by SonarQube and discuss how and when you will address them. 7. Conduct and document your Sprint 2 Retrospective. Meet with your product owner for acceptance testing and getting feedback 8. Prepare your Release 1 presentation for the instructor and practice it with all team members at least once. 9. Submit your presentation on your Discord team channel by Sunday, Feb 8 midnight. 10. Plan Sprint 3 in GitHub Projects by adding user stories from your backlog (add features than can be completed within 2 weeks)		
Release 2 (~1 month) Sprint 3 Sprint 4	-**Agile Planning**: **2** points -**Retrospectives**: (Include retrospectives for each Sprint. All actions in the retrospective should be justified based on the “lessons learned” from the previous sprints): **1** point -**Software Architecture** (Discuss the source code implementation of your design patterns and how you extended these patterns over time as new requirements were implemented): **2** points -**UI Prototypes**: **4** points -**Unit/System Testing Report**: **3** points -**Usability/Performance testing** (Research about usability testing tools for mobile applications): **4** points	30%

	- **Issue Tracker** (Create bug reports with replication steps, screenshots, links to the commits fixing the bug for traceability, links to commits updating tests to cover the reported bug. All issues related to bugs should be tagged with "bug" label, issues related to performance should be tagged with "performance" label): **2** points -**Refactoring activity** (List the commits and pull requests in which refactoring took place. The commits and pull requests should explicitly mention/discuss/motivate the type(s) of refactoring. The complete list of refactoring types is available at https://refactoring.com/catalog/: **2** points **-Code reviewing**: **4** points -**Code Quality and Security Report** (List the commits and pull requests in which technical debt, security vulnerabilities, and code convention violations have been addressed. The commits and pull requests should explicitly mention/discuss/motivate the type(s) of technical debt addressed): **3** points **-Presentation to the Instructor**: **3** points	

Suggested plan for **Sprint #3**

1. Implement the planned features for Sprint 3
2. Write unit tests for your code
3. Submit your feature implementations as Pull Requests. Assign team members for code review. There should be active discussions and suggestions for improvements. These suggestions could also include refactorings. Document systematically your refactoring efforts by collecting commits and PRs with specific types of refactorings
4. Create UI mockups for the user stories you will implement in Sprint 4 and get feedback from your product owner.
5. At this point you should have automated System/UI tests for all implemented features so far. You will do manual system testing for the ongoing features and report well documented bug reports on GitHub as issues. Moreover, your test suite should be mature and large enough to reveal regressions. In case of regression, document the problem with a bug report, before fixing the issue.
6. Investigate potential design patterns that could be useful for your project. Justify their need in your project.
7. Investigate how you will conduct usability testing and create the required infrastructure (setup and try usability testing tools).
8. Plan your Sprint 4 in GitHub Projects by adding some user stories from your backlog (add features than can be completed within 2 weeks. Note that in the next Sprint you will conduct a pilot usability testing. Make a realistic plan)
9. Conduct and document your Sprint 3 Retrospective. Meet with your product owner for acceptance testing and getting feedback

Suggested plan for Sprint #4

1. Implement the planned features following the same practices (PRs, code reviews, unit tests)
2. Introduce design patterns in your project. Document commits where your design pattern instances were introduced and evolved (adding new abstract methods, adding new subtypes)
3. Address technical debt and security warnings from SonarQube. Update your SonarQube (code quality) report
4. Create UI mockups for the user stories you will implement in Release 3 (Sprints 5 and 6) and get feedback from your product owner.
5. Add automated System/UI tests for the newly implemented features.
6. Recruit users for usability testing. Select some of them and run a pilot usability testing to make sure that there will be no problems with the full-scale usability testing in Release 3.
7. Conduct and document your Sprint 4 Retrospective. Meet with your product owner for acceptance testing and getting feedback
8. Prepare your Release 2 presentation for the instructor and practice it with all team members at least once.
9. Submit your presentation on your Discord team channel by Sunday March 8 midnight.
10. Plan your Sprint 5 in GitHub Projects by adding some user stories from your backlog (add features than can be completed within 2 weeks)

<table>
<tr><td>Release 3
Sprint 5
Spring 6</td><td>-Agile Planning: 2 points
-Retrospectives: (Include retrospectives for each Sprint. All actions in the retrospective should be justified based on the “lessons learned” from the previous sprints): 1 point
-Unit/System Testing Report (At this point all user stories should be automated): 4 points
-Usability testing (Collect user session recordings. Analyze the collected data to find ways to improve the UI experience. Implement the UI improvement opportunities you found): 5 points
-Issue Tracker (At this point all open bugs, performance issues should be addressed): 3 points
-Refactoring activity: 4 points
-Code reviewing: 4 points
-Code Quality and Security Report (At this point all technical debt, security vulnerabilities, code convention violations, and code smells should be addressed. If not addressed, you should explain the reasons): 4 points
-Presentation to the Instructor: 3 points</td><td>30%</td></tr>
<tr><td colspan="3">Suggested plan for Sprint #5
1. Conduct full-scale usability testing with all recruited users. Record user sessions and analyze the collected data. Find opportunities to improve the UI experience.
2. Implement the remaining planned features
3. Write unit tests for the new features
4. Submit your features in Pull Requests. Assign team members for code review. There should be active discussions and suggestions for improvements. These suggestions should also include refactorings. Document systematically your refactoring efforts by collecting commits and PRs with specific types of refactorings
5. Add automated end-2-end tests tests for the newly implemented features.
6. Address technical debt and security warnings from SonarQube. Update your SonarQube (code quality) report
7. Plan your Sprint 6 in GitHub Projects by adding any remaining user stories from your backlog.
8. Conduct and document your Sprint 5 Retrospective. Meet with your product owner for acceptance testing and getting feedback</td></tr>
<tr><td colspan="3">Suggested plan for Sprint #6
1. Address the usability issues you found in Sprint 5 usability testing.
2. Add automated System/UI tests for all implemented features.
3. Address all remaining technical debt and security warnings from SonarQube. Update your SonarQube (code quality) report
4. Conduct and document your Sprint 6 Retrospective. Meet with your product owner for any remaining acceptance testing
5. Prepare your Release 3 presentation for the instructor and practice it with all team members at least once.
6. Submit your presentation on your Discord team channel by the deadline</td></tr>
<tr><td>Acceptance tests</td><td>Percentage of the number of user stories signed-off by the product owner through acceptance tests over the total number of user stories in the backlog.

For each user story there should be an acceptance test in the issue tracker of the project.
The test is considered as accepted if it is signed-off with the account of the product owner by making an accept comment on the corresponding issue.</td><td>20%</td></tr>
</table>

Graduate Attributes:

Graduate attribute	Indicators	Level of learning	Link to assessments
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate	Demonstration of application of most of the knowledge and skills learned in all courses in the program in a project specified by the instructor, developing, modelling and documenting analysis and design, implementation and testing. This attribute will be evaluated based on the quality of the final software product and the delivered report (essentially, this graduate attribute is assessed from the final grade for the course).
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis	Intermediate	Analyze and document the provided project requirements. This attribute will be evaluated based on your final Requirements Document and the quality of the User Story Backlog.
Investigation	INV-1 Background and hypothesis formulation INV-2 Designing experiments INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Intermediate	Investigate on different proposed solutions for the project. Design elaborated testing using elaborated tools and techniques to prove important system qualities. This attribute will be assessed based on the Feasibility Analysis performed for the new feature requested by the project owner close to the end of the project.
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Intermediate	Develop and document architectural and detailed design for the adopted solution for the project. This attribute will be evaluated based on your final Software Architecture Document.
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Intermediate	Use appropriate tools to manage, analyze, design and implement the project. This attribute will be evaluated based on the degree of utilization of software engineering tools (e.g., GitHub, ZenHub, Prototyping tools, SonarQube).
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution: practical/conceptual	Intermediate	Work in teams to design and implement a software project from requirements provided by the coordinator. This attribute will be evaluated based on your Sprint

	ITW-3 Initiative and leadership ITW-4 Team dynamics		Planning reports and Sprint Retrospectives
Communication skills	CO-1 Writing process CO-2 Information gathering CO-3 Documentation CO-4 Oral presentation	Intermediate	Demonstrate the software and prepare adequate documentation for it. This attribute will be evaluated from the quality of your project presentations in all iterations.
Professionalism	PR-1 Role and responsibilities of professional engineers PR-2 Professional practice	Intermediate	The project requires professional interactions with the stakeholders and within the team. This attribute will be evaluated based on the peer-evaluation forms.
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate	Analyze the possible ethical aspects of the problem or its solution. This attribute is not always applicable and its applicability depends on the nature of the project. If your project deals with ethical concerns, you should discuss them in the Requirements document.
Economics and project management	EPM-2 Economics evaluation of projects EPM-3 Project planning and implementation	Intermediate	Project cost/effort estimation and tracking. This attribute will be evaluated based on your Risk Management Plan and Test/Quality Reports.

Course Learning Outcomes (CLOs):
By the end of this semester, students will be able to:

Course Learning Outcomes (CLOs)	**Related Graduate Attribute and Indicator**
Collect and document the requirements for a mobile application from a client (product owner)	CO
Design and implement a fully functional software.	DE
Design the user interface for a mobile application and test its usability. Improve the usability based on client's feedback.	DE
Work in small teams following the agile software development process (6 sprints and 3 releases in total, team should deliver a functional software at the end of each release).	ITW
Assess and manage the risks of the project.	EPM
Plan the tasks to be completed before the beginning of each sprint.	EPM
Assess the success of each sprint after its end, and take actions to improve (retrospective).	EPM
Test the functionality of the software (unit, system, integration testing).	INV
Assess the design and code quality of the software and refactor the code to improve quality.	DE
Use software engineering tools for project management (e.g., ZenHub), source code management and bug tracking (e.g., GitHub, Bitbucket), testing (e.g., JUnit, Espresso), source code development and refactoring	EPM

(e.g., Eclipse, IntelliJ IDEs), quality monitoring (e.g., SonarQube), UI prototyping (e.g., Moqups).	
Demonstrate understanding of the ethics/equity risks involved in the project and implement risk mitigation strategies/models.	EE

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 392 AI and Society (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces students to the broader societal contexts that shape and are shaped by artificial intelligence (AI). Students learn to view AI as part of larger social, economic, and environmental systems that influence how AI technology is developed and deployed, and how engineers can respond to these challenging questions in responsible and ethical ways. Students learn about transparency, privacy, ethics, human rights, AI policies, regulations and governance. Students also learn to apply responsible innovation frameworks and the human rights AI impact assessment on case studies. Lectures: three hours per week.

Components: Lecture 3 hours per week

Prerequisites: ENCS 282
Co-requisites: N/A

Course materials
Readings, selected book chapters, international reports, documentaries, films and interviews, will be part of assignments and class activities and preparation for the midterm evaluation. Independent literature research will be required for the project. The lists below show an incomplete selection of resources.

Book chapters

- Karen Hao, “Empire of AI. Dreams and Nightmares in Sam Altman's OpenAI” (Penguin Press, 2025)
- Kate Crawford, “Atlas of AI” (Yale University Press, 2021)
- Ruha Benjamin, “Race After Technology” (Polity, 2019)
- Virginia Eubanks, “Automating Inequality” (Picador, 2019)
- Safia Umoia Noble, “Algorithms of Oppression” (NYU press, 2018)
- Amy Webb, “The Big Nine”, (PublicAffairs, 2020)

Online resources

- AI Now Institute https://ainowinstitute.org/
- AI for good (UN platform on AI) https://aiforgood.itu.int/
- Human Rights AI Impact Assessment https://www3.ohrc.on.ca/en/human-rights-ai-impact-assessment
- Kate Crawford and Vladan Joler (2023) “Calculating Empires” https://calculatingempires.net/
- “Coded bias” documentary on Netflix https://www.netflix.com/ca/title/81328723
- “Responsible Research and Innovation explained” (European Union) https://rri-tools.eu/
- “Algorithmic Justice League” https://www.ajl.org/
- “Gendered Innovations” https://genderedinnovations.stanford.edu/

- “Last week tonight with John Oliver” (HBO) (“Housing discrimination”, “Facial recognition”, “Police”, “Government surveillance”, and many others.) https://www.youtube.com/show/SC1Dd2OxhAzUXWuhFBFecIAA?season=1&sbp=CgEx
- “AI, Ain’t I a Woman?” Joy Buolamwini (youtube) https://www.youtube.com/watch?v=QxuyfWoVV98
- “Atlas of AI: Kate Crawford in conversation with Judy Wajcman” (youtube) https://www.youtube.com/watch?v=a7Tx-yHHEYo&t=1516s

Reports, declarations, and articles

- Universal Declaration of Human Rights https://www.un.org/en/about-us/universal-declaration-of-human-rights
- Sustainable Development Goals https://sdgs.un.org/goals
- Stanford’s AI100 Report https://ai100.stanford.edu/
- UNESCO’s report on artificial intelligence and gender equality https://en.unesco.org/AI-and-GE-2020
- What Really Happened When Google Ousted Timnit Gebru (Wired, June 2021) https://www.wired.com/story/google-timnit-gebru-ai-what-really-happened/
- Are These Tech Companies Complicit In Human Rights Abuses Of Child Cobalt Miners In Congo? (Forbes, January 2020) https://www.forbes.com/sites/ewelinaochab/2020/01/13/are-these-tech-companies-complicit-in-human-rights-abuses-of-child-cobalt-miners-in-congo/?sh=2abbb28c3b17
- Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., ... & Nerini, F. F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. Nature communications, 11(1), 1-10. https://www.nature.com/articles/s41467-019-14108-y
- Zou, J., & Schiebinger, L. (2018). AI can be sexist and racist—it’s time to make it fair. https://www.nature.com/articles/d41586-018-05707-8
- Brundage, M., Avin, S., Clark, J., Toner, H., Eckersley, P., Garfinkel, B., ... & Amodei, D. (2018). The malicious use of artificial intelligence: Forecasting, prevention, and mitigation. https://arxiv.org/ftp/arxiv/papers/1802/1802.07228.pdf
- Buolamwini, J. & Gebru, T., “Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification”. Proceedings of Machine Learning Research 81:1–15, 2018 https://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf

Grading Scheme

Assessment tool	**Weight**
Mini-assignments (short quizzes on class content)	20%
Midterm knowledge evaluation	35%
Presentation of project plan and topic (group assignment)	15%
Final project in-class presentation (group assignment)	15%
Final project video (group assignment)	15%
Total	100%

Tentative Course Schedule

Slight modifications might occur based on the specific interest of students and in response to current events and developments.

Week	Input
1	Introduction to AI and Society
2	History of AI in society
3	Datasets, algorithms and classification
4	Bias and transparency
5	Environment and planetary costs
6	Data labor, data business
7	AI and Democracy
8	AI Ethics
9	Governance, policy, and regulations
10	Responsible research and innovation
11	AI Human Rights Impact Assessment
12	Final Project Presentations

Details on assessment tools:

Mini-assignments (20%)

These mini-assignments will be short presentations, handwritten reflections on in-class discussions, quizzes, etc. The mini-assignments will be unannounced and completed in class.

Midterm knowledge evaluation (35%)

The midterm knowledge evaluation will give you to opportunity to demonstrate what you have learned in the course.

Group assignment

There will be one major group assignment consisting of a presentation of the project topic and plan, an in-class presentation of the project and a final project video.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Knowledge base in engineering	KB-3 Knowledge base in specific domain	Intermediate
Professionalism	PR-1 Role and responsibilities of professional engineers PR-2 Professional practice	Intermediate
Impact of engineering on society and the environment	IES-1 Societal impact of engineering IES-2 Sustainability and environmental stewardship	Intermediate
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Understand the larger social, economic, and environmental context of AI	IES-1, IES-2
Articulate current societal concerns related to AI	IES-1, EE-1, EE-2
Reflect engineering practice and research in AI development	KB-3
Gain knowledge of policies, regulations, legislations and institutional frameworks	PR-1, PR-2
Develop skills to perform a human rights impact assessment of AI systems	EE-2
Apply responsible research and innovation (RRI) practices on AI	PR-1, PR-2, EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 487 Artificial Intelligence and Machine Learning in Cybersecurity (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
The course introduces students to advanced topics of artificial intelligence and machine learning (AI/ML) in cybersecurity, including threats, risks, and mitigations for secure and trustworthy AI/ML deployment as well as threats, risks, and mitigation against adversarial AI/ML like DeepFake and others targeting security, privacy, and other applications. In addition, the course covers the ethical aspects and responsible use of AI and machine learning in cybersecurity such as ethical foundations, societal impact, transparency, accountability, safety, security and data and privacy governance.

Components: Lecture 3 hours per week

Prerequisites: AI 300
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming (Python)
- Basic concepts and algorithms of artificial intelligence and machine learning
- Technical writing and reporting

Course materials
Suggested Textbook: To be determined based on the specific projects available each term.
Instructor's lecture notes: Will be posted on the Moodle course site.
Software use: To be determined based on the specific case studies available each term

Grading Scheme

Assessment tool	Weight
Assignments	10%
Midterm quiz	25%
Project	25%
Final exam	40%
Total	100%

Tentative Course Schedule

Week	Modules
1	Introduction to the AI/ML Ecosystem and Cybersecurity Implications
2-3	Cyber Threats to AI/ML: Poisoning and Evasion Attacks
4-5	Cyber Threats to AI/ML: Model Inference and Other Threats
6	Risk Assessment and Management for AI/ML Systems
7	Midterm Quiz
7-8	Adversarial Machine Learning and Their Cybersecurity Implications

9-10	Adversarial AI/ML in Broader Context: DeepFake, Privacy and Beyond
11	Building Secure, Ethical, Responsible, Explainable and Trustworthy AI/ML
12	Project Presentations

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
A knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate
Investigation	INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Intermediate
Use of engineering tools	UET-1 Ability to use appropriate engineering tools and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Advanced
Communication skills	COM-1 Writing process COM-2 Information gathering COM-3 Documentation COM-4 Oral presentation	Intermediate
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution: practical / conceptual ITW-3 Initiative and leadership ITW-4 Team dynamics	Intermediate
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate
Life-long learning	LL-1 Identifying missing knowledge and learning opportunities LL-2 Continuous improvement and self-learning	Intermediate

Course Learning Outcomes (CLOs):
By the end of this semester, students can expect to acquire the following skills:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Describe advanced cybersecurity principles and practices for AI/ML systems	KB-3
Identify and describe cybersecurity requirements, risks, and mitigations for AI/ML systems	PA-1, PA-2, PA-4, COM-2, COM-3
Identify and describe security models, standards, controls and countermeasures to protect AI/ML systems against cyber threats	PA-2, UET-2, UET-3, COM-2, COM-3, LL-1, LL-2

Apply ethical and safety principles and the general principle of responsive use of AI in cybersecurity.	INV-3, INV-4, EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
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On Campus Resources
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AI 490 Capstone AI Engineering Design Project (6 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
Students work in teams of at least four members over two consecutive terms (8 months) to design, develop, deploy, and evaluate a substantial AI-enabled software system for a real client or stakeholder. Projects are based on authentic problem contexts and involve direct interaction with external stakeholders, iterative feedback from end users, and evolving requirements. The system must integrate Artificial Intelligence (AI) components as a central element of its functionality. AI components may include machine learning models, large language models, predictive analytics, intelligent decision systems, or other advanced data-driven techniques. Students may develop, adapt, fine-tune, or responsibly integrate existing AI models within a production-quality software system. Teams are expected to carry out the full software engineering lifecycle, including stakeholder engagement, requirements elicitation and refinement, system and software architecture design, AI model evaluation and validation, risk management, testing, deployment planning, and maintenance considerations. Emphasis is placed on scalability, robustness, security, privacy, ethical considerations, and responsible AI practices in real-world settings. Regular milestone reviews, client presentations, and technical demonstrations are required. Each team member must present their individual contributions and participate in system validation activities, including demonstrating system performance and gathering and incorporating stakeholder feedback.

Prerequisites: AI 390; 75 program credits
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Software engineering design and implementation.
- Machine learning frameworks, LLM platforms and OSS models, MLOps

Grading Scheme
A grading rubric including engineering design and implementation is shared with the class and will be used by the TAs and Professor. Grades are assigned at each release. You must pass the final release and presentation to pass the course. You will lose 1% of your total grade for any missed deadline.

Assessment tool	**Weight**
Release 1	30%
Release 2	30%
Final Release and presentation	40%
Total	100%

Tentative Course Schedule

Students will work in two- to three-week iterations. There will be three releases, each is worth the following:
Release 1: 30%, due TBD
Release 2: 30%, due TBD
Final Release and presentation: 40%, due TBD

Engineering Tools
GitHub, Docker, and Continuous Integration and Release tooling, Machine learning frameworks, LLM platforms and OSS models, MLOps

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of knowledge
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving	Advanced
Investigation	INV-1 Background and hypothesis formulation INV-2 Designing experiments INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Advanced
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Advanced
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources	Advanced
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution: practical/conceptual ITW-3 Initiative and leadership ITW-4 Team dynamics	Advanced
Communication skills	CO-2 Information gathering CO-3 Documentation CO-4 Oral presentation	Advanced
Professionalism	PR-1 Role and responsibilities of professional engineers PR-2 Professional practice	Advanced
Impact of engineering on society and the environment	IES-1 Societal impact of engineering IES-2 Sustainability and environmental stewardship	Advanced
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Advanced
Economics and project management	EPM-1 Fundamentals of economics EPM-2 Economics evaluation of projects EPM-3 Project planning and implementation	Advanced

Life-long learning	LL-1 Identifying missing knowledge and learning opportunities LL-2 Continuous improvement and self-learning	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students will be able to:

Course Learning Outcomes (CLOs)	**Related Graduate Attribute and Indicator**
This course is about the demonstration of application of most of the skills learned in all courses in the program in a real-life project, ranging from project management issues, to analysis and design modelling, implementation and testing.	KB-3
The project is open-ended and requires an analysis phase that is to be done using techniques / documentation taught in preceding courses dedicated to analysis.	PA-1
Design elaborated testing using elaborated tools and techniques to prove important system qualities.	INV-1
Investigate different proposed solutions for the project. The project is open-ended and requires elaborated architectural and detailed design solutions to be documented and implemented.	DE-2
The project requires the use of many tools whose use was taught in preceding courses, during all phases of development, and to manage the project. Resource analysis needs to be undertaken as part of the project, and proper standards, tools and libraries be found and used for the implementation.	UET-1
By the end of this semester, students are expected to master and to have demonstrated substantial engineering design and implementation of a real software system that integrates AI in a substantial manner.	All GAs in table above.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI Elective Courses

AI 401 Edge AI (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: Please see your class schedule for details

Course Calendar Description:
This course provides a comprehensive study of deploying Artificial Intelligence (AI) and Machine Learning (ML) models on resource-constrained embedded systems and edge devices. It examines the challenges imposed by tight power, memory, and computational budgets, and introduces key model optimization techniques such as weight clustering, low-rank adaptation, and pruning. The course also covers efficient neural network architectures for edge inference and deployment frameworks for both microcontroller-based and GPU-based edge platforms. Through a combination of foundational TinyML concepts and broader system-level perspectives from modern Edge AI concepts, students gain hands-on experience deploying and evaluating AI models on industry-standard platforms such as ARM Cortex-M microcontrollers or NVIDIA Jetson devices. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 350
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Embedded Systems Fundamentals: Understanding of microcontroller architectures, memory-mapped I/O, interrupts, and real-time constraints.
- Machine Learning Basics: Understanding of supervised learning, neural network fundamentals (CNNs, RNNs), loss functions, and training procedures.
- Programming Skills: Basic proficiency in Python and C/C++.

Course materials
Required Textbook: *TinyML: Machine Learning with TensorFlow Lite on Microcontrollers*; Warden, P., & Situnayake, D.; O'Reilly Media; 2019

Recommended references:
- *Designing Machine Learning Systems: An Iterative Process for Production-Ready Applications*; Huyen, C.' O'Reilly Media; 2022.
- *AI at the Edge*. Daniel Situnayake & Jenny Plunkett. O'Reilly Media, 2023.

Additional Course Materials: In addition to the textbooks, students will be provided with curated research papers, technical documentation, and software tutorials to cover advanced topics such as GPU-based edge platforms, neural architecture search, and federated learning

Lecture Slides: Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	45%
Design Project	35%
Total	100%

Tentative Course Schedule

Week	Topic	Description & Key Concepts
1	Introduction to Edge AI and Deployment Platforms	Cloud vs. Edge AI; motivations (latency, privacy, bandwidth); overview of edge platforms and use cases; introduction to deployment targets such as ARM Cortex-M microcontrollers and NVIDIA Jetson; overview of Edge AI toolchains and the overall deployment process.
2	Edge Platforms and Embedded Constraints	Microcontroller architectures (ARM Cortex-M); memory and power constraints; real-time considerations; characterization of edge workloads on target hardware; measurement of memory footprint, latency, and power consumption.
3	DNN Fundamentals for Edge I	Review of neural networks for edge inference (CNNs, RNNs, and Transformers); computational and memory requirements; analysis of model components that dominate computation and memory usage.
4	DNN Fundamentals for Edge II	Data representation; fixed-point and integer formats; model representation and parameter storage; encoding mechanisms (e.g., weight sharing and Huffman coding); impact on memory footprint and inference efficiency.
5	Model Quantization and Weight Clustering	Post-training quantization; quantization-aware training; INT8, INT4, and mixed-precision inference; accuracy–performance trade-offs.
6	Pruning and Sparsity	Structured and unstructured pruning; sparsity patterns; Magnitude-based and gradient-based methods; Hardware support for sparse inference.
7	Knowledge Distillation Midterm Exam	Teacher-student frameworks; soft labels and temperature; feature-based and attention-based distillation; trade-offs between accuracy and model size.
8	Efficient Architectures I	Depthwise separable convolutions; MobileNet V1/V2/V3; ShuffleNet; Inverted residuals.
9	Efficient Architectures II	EfficientNet and compound scaling; SqueezeNet; Neural Architecture Search (NAS) for edge devices.
10	Deployment Frameworks	TensorFlow Lite; ONNX Runtime; PyTorch Mobile; Model conversion and deployment pipelines.
11	GPU-Based Edge Platforms	NVIDIA Jetson family; TensorRT optimization; CUDA basics for edge; Performance benchmarking.

12	Applications & Future Trends	Edge AI applications (vision, audio, sensors); Federated learning; On-device training; Emerging hardware.

Project Details
The project component of this course provides hands-on experience with Edge AI systems through a progressive approach. Students begin by deploying a pre-built reference neural network on a real edge platform to become familiar with the hardware, software toolchain, and execution workflow. Once the deployment environment is mastered, students progressively analyze, modify, optimize, and redeploy the model by applying concepts introduced throughout the course, including model compression and efficient architecture techniques.

Project Expectations:
The project is expected to address the following phases:

- **Initial Deployment and Platform Familiarization**: Deployment of a provided, pre-built neural network model on an edge platform (ARM Cortex-M microcontroller or NVIDIA Jetson). Familiarization with the toolchain, runtime environment, and deployment workflow.
- **Model Characterization**: Measurement and analysis of memory footprint, latency, and (when applicable) power consumption of the deployed model on target hardware.
- **Model Analysis**: Profiling the original, uncompressed model to analyze computational complexity, memory footprint, and inference performance.
- **Model Optimization**: Progressive application of optimization techniques such as pruning, quantization, encoding, and/or architectural modifications.
- **Redeployment and Evaluation:** Deployment of the optimized model on the target platform and evaluation of improvements relative to the initial deployment.

Project Documentation and Instructions:
Project guidelines and setup instructions for the required tools and hardware platforms will be available on the course Moodle site to support the deployment-first project workflow.

Engineering Tools
Students will be introduced to and utilize the following industry-standard engineering tools throughout the course:

- **TensorFlow Lite:** Framework for deploying machine learning models on mobile, microcontrollers, and edge devices.
- **ONNX Runtime:** Cross-platform inference engine for deploying models in ONNX format.
- **PyTorch/TensorFlow:** Primary frameworks for model design, training, and optimization experimentation.
- **Edge Impulse Studio:** End-to-end platform for developing embedded ML applications.
- **NVIDIA TensorRT:** SDK for high-performance deep learning inference on NVIDIA GPUs.
- **ARM CMSIS-NN:** Optimized neural network kernels for ARM Cortex-M processors.
- **Profiling Tools:** Power monitors, memory analyzers, and latency profilers for embedded systems.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Evaluate edge AI platforms and their constraints for specific AI workloads.
CLO 2: Implement efficient DNN models using compression techniques such as weight clustering, low-rank, and pruning.
CLO 3: Compare and select edge-optimized neural network architectures.
CLO 4: Deploy and benchmark AI models using TensorFlow Lite, ONNX Runtime, or PyTorch Mobile.
CLO 5: Explore emerging Edge AI applications and on-device learning techniques.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 411 AI Hardware Accelerators (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course provides an in-depth study of hardware architectures and systems designed to efficiently accelerate Deep Neural Networks (DNNs) and modern AI workloads. Students examine the computational, memory, and energy challenges posed by large-scale models, including data movement bottlenecks and the memory wall. Topics include accelerator architectures and dataflow optimizations, hardware-aware model compression techniques (quantization, pruning, sparsity), and case studies of industrial platforms such as Google TPU, NVIDIA NVDLA, and emerging AI accelerators. The course also covers distributed machine learning systems and hardware–software co-design approaches that reduce computation and communication costs. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 350
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics:

- **Digital System Design:** Proficiency in combinational and sequential logic, finite state machines (FSM), and timing analysis.
- **Hardware Description Languages (HDL):** Experience in designing and simulating hardware modules using VHDL/Verilog or SystemVerilog.
- **Computer Architecture:** Understanding of memory hierarchies (caches, buffers, DRAM), pipelining, and ISA (Instruction Set Architecture) fundamentals.
- **Machine Learning Basics:** Understanding of supervised learning, neural network fundamentals, loss functions, and training procedures.

Course materials
Required Textbook: *Efficient Processing of Deep Neural Networks*; Vivienne Sze, Yu-Hsin Chen, Tien-Ju Yang, and Joel S. Emer; Morgan & Claypool Publishers (Springer Nature), 1st Edition, 2020.

Other course materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- Research Papers: A curated list of seminal papers including the "Eyeriss" architecture, Google TPU (ISCA 2017), and NVIDIA NVDLA documentation
- Software Tools: * PyTorch: For DNN model design and exploration
- Accelergy & Timeloop: Infrastructure for evaluating the energy and performance of DNN accelerators
- Xilinx Vivado HLS: For High-Level Synthesis laboratory exercises
- Lecture Slides and Lab Manuals: Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	45%
Design Project	35%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to AI Hardware Architectures	Evolution of AI computing; CPUs vs. GPUs vs. Accelerators; Review of DNN layers (CNN, FC), Systolic Arrays basics
2	FPGA based AI Hardware Accelerator	Instruction Set Architecture (ISA); Matrix Multiply Unit design; introduction to hardware-software co-design; Performance analysis
3	Model Quantization	Number formats (INT8, FP16, Bfloat16); Linear/Non-linear quantization; Impact on area and energy
4	Stationary Dataflows I	Analysis of Weight-Stationary (WS) and Output-Stationary (OS) flows; Data reuse strategies
5	Stationary Dataflows II	Row-Stationary (RS) dataflow; Case study of the Eyeriss architecture and hierarchical memory
6	Memory Hierarchy Design	On-chip buffers (Scratchpads); Global buffers; Network-on-Chip (NoC) for data distribution
7	Sparsity and Pruning Midterm Exam	Structured vs. Unstructured pruning; Hardware support for zero-skipping; Compressed storage (CSC/CSR)
8	Evaluation Metrics	Accuracy, Latency, Throughput; Energy efficiency (J/op); The "Memory Wall" challenge. Benchmarks.
9	Case Study: Google TPU	Instruction Set Architecture (ISA); Matrix Multiply Unit (MXU) design; Performance analysis.
10	Advanced Industry Designs	Review of NVIDIA NVDLA (modular SoC) and SCNN (sparse CNN accelerator).
11	Emerging Paradigms	Processing-In-Memory (PIM); Neuromorphic computing basics.
12	Hardware-Aware NAS	Introduction to Neural Architecture Search; Designing DNNs for specific hardware latency targets.

Project Details
The project component of this course provides hands-on experience in designing, modeling, and evaluating AI hardware accelerators using industry-standard tools.

Project expectations:

- **Inference and DNN Model Design:** Introduction to DNN modeling in Python/PyTorch; analyzing computational complexity and estimating energy costs for various network architectures.
- **Kernel + Tiling Optimization:** Using tools like **Timeloop** and **Accelergy** to explore data reuse strategies and optimize tiling for different memory hierarchies.

- **Hardware Design & Mapping:** Designing a Systolic Array or a Matrix Multiplication Unit using **Verilog/SystemVerilog** or **High-Level Synthesis (HLS)**.
- **Sparse Accelerator Design:** Implementing and evaluating hardware techniques for zero-skipping and exploiting sparsity in weights and activations.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **PyTorch:** Utilized for designing Deep Neural Network (DNN) models and extracting workload characteristics (e.g., weights and activations) for hardware mapping.
- **Timeloop:** A systematic infrastructure for evaluating and exploring the architecture design space of DNN accelerators.
- **Accelergy:** An architecture-level energy estimation framework used in conjunction with Timeloop to quantify energy efficiency.
- **Xilinx Vivado HLS (High-Level Synthesis):** Used for transforming C/C++ specifications into Register Transfer Level (RTL) implementations for FPGA-based acceleration.
- **SystemVerilog/Verilog:** For RTL-level design and functional verification of Processing Elements (PEs) and memory interfaces.
- **Simulators:** Various architectural simulators for analyzing Network-on-Chip (NoC) traffic and memory bandwidth utilization.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Evaluate and quantify the energy, throughput, and latency trade-offs of various DNN hardware architectures.
CLO 2: Analyze and select optimal dataflow strategies (Row-Stationary, Weight-Stationary) for specific AI workloads.
CLO 3: Implement and assess hardware-aware model compression techniques, including quantization and pruning.
CLO 4: Utilize professional engineering tools (Timeloop, Accelergy, Vivado HLS) to simulate and optimize AI hardware.
CLO 5: Design a modular AI hardware accelerator and document its performance through technical reporting.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 412 AI for Wearable Health Applications (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces students to the design, development, and evaluation of artificial intelligence systems for health applications using wearable and large-scale sensor data. The course covers data acquisition, signal processing, feature engineering, machine learning, deep learning, large language models, and multimodal systems, with emphasis on clinical validation, ethical deployment, and personalized health monitoring.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Basic concepts of machine learning: Students should be familiar with classical machine learning concepts and models, specially supervised machine learning. Recommended resource: https://www.kaggle.com/learn/intro-to-machine-learning
- Signal processing: Students should understand basic signal processing concepts including frequency domain analysis, sampling, and filters. Recommended resource: https://matlabacademy.mathworks.com/details/signal-processing-onramp/signalprocessing
- Programming: Students should be proficient in programming, ideally with Python. Recommended resources:
- Intro to Python: https://colab.research.google.com/github/cs231n/cs231n.github.io/blob/master/python-colab.ipynb
- Advanced Python: https://colab.research.google.com/drive/1gCqFEquqNvEoTDX3SNhR2PZkXWPHKXnc?usp=sharing
- Working with Time Series: https://colab.research.google.com/github/jakevdp/PythonDataScienceHandbook/blob/master/notebooks/03.11-Working-with-Time-Series.ipynb

Course materials
Required Textbook: *Machine learning for healthcare technologies*. Clifton, D. A. The Institution of Engineering and Technology. Available online via Concordia Library: https://concordiauniversity.on.worldcat.org/oclc/962412218

Other suggested textbooks:

- Najarian, K., & Splinter, R. (2012). Biomedical Signal and Image Processing. CRC Press. Available online via Concordia Library https://concordiauniversity.on.worldcat.org/oclc/1030993403
- Labrador, M. A., & Lara Yejas, O. D. (2014). Human activity recognition : using wearable sensors and smartphones. CRC Press. https://concordiauniversity.on.worldcat.org/oclc/869311332
- de Vries, G., Blachman, J., O'Reilly for Higher Education (Firm), & Safari, an O'Reilly Media Company. (2020). The Patient Equation (1st edition). Wiley. https://concordiauniversity.on.worldcat.org/oclc/1266265767

Supplementary notes will also be provided.

Grading Scheme

Assessment tool	Weight
Participation, quizzes. tutorials	10%
Midterm Exam	30%
Final Exam	30%
Project	-
Assignments	30%
Total	100%

Tentative Course Schedule

Week	Topics / Activities
1	Introduction to AI healthcare and digital health. The role of wearables in digital health. Sense–Think–Act paradigm. Types of applications. Digital biomarkers.
2	Sensors and embedded data acquisition: Accelerometers and gyroscopes. ADCs, sampling, power constraints. Signal conditioning and filtering. Case study: Step detection.
3	Classical Machine Learning with Engineered Features. Windowing. Time/frequency feature extraction. Feature selection. Traditional classifiers. Case study: Activity recognition.
4	Deep Learning for Wearable Time-Series Data. CNNs, RNNs, and temporal convolutions. End-to-end learning. Case study: Activity classification.
5	Actuators and closed-loop health systems. Haptic, audio, and visual feedback. Control strategies. AI-driven interventions. Case study: Activity coaching system.
6	Actuators and closed-loop health systems. Haptic, audio, and visual feedback. Control strategies. AI-driven interventions. Case study: Activity coaching system.
7	Midterm Exam
8	Model evaluation and physiological interpretation. Optical and physiological sensors. PPG sensing principles. Signal quality assessment. Artifact removal. Case study: Heart rate estimation.
9	Representation Learning and Self-Supervised Learning for Health Data. Contrastive learning. Autoencoders. Foundation models for wearables.
10	Multimodal and large-scale health AI systems. Early and late fusion. Cloud–edge architectures. Population-scale modeling. Case study: Stress detection.
11	Ethical implications and regulations: privacy, ethics, user control. Understanding the effects on health. PIPEDA and Quebec's Law 25.
12	Embedded AI tools for wearables. – Final Review

Engineering Tools
Python
Wearable data acquisition platform (emotibit / max health band)

Project description:
The project component of this course provides hands-on experience in designing, modeling, and evaluating AI for wearable health applications.

Project expectations:
The project will be completed in three phases: proposal, model development, and personal data collection and evaluation. In the proposal phase, students will define a health or behavioral application, review relevant literature and datasets, and clearly describe the sensing, analysis, and action components of their system. In the model development phase, students will use a public dataset to design, train, and evaluate a machine learning model following a standard data processing and validation pipeline. In the final phase, students will collect and annotate personal sensor data using mobile or wearable devices, test their model in realistic

conditions, and demonstrate that the system's action or feedback component works. Projects must be feasible within the course timeline.

Other information

Teaching approach

The teaching approach for this course will be dynamic and inclusive, integrating a combination of interactive lecturing, case study discussions, small group activities and discussions, and coding tutorials designed to accommodate students with diverse preferences. During the lectures, there will be frequent opportunities for students to engage with the content, ask questions, check their knowledge and receive feedback. Tutorials will deepen or expand the concepts being taught during the lectures, often through a case study. This approach aims to create an engaging and supportive learning environment where all students can thrive.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following computer engineering concepts.

1. Describe the principles, limitations, and performance trade-offs of sensors and actuators used in wearable and embedded health systems.
2. Implement data acquisition, signal processing, and data engineering pipelines for AI-based analysis of physiological and behavioral data.
3. Develop machine learning, deep learning, and self-supervised learning models for health monitoring and prediction using wearable and multimodal data.
4. Evaluate end-to-end AI-enabled health systems using appropriate experimental design, performance metrics, and validation protocols.
5. Analyze ethical, privacy, regulatory, and societal implications of deploying AI systems in healthcare.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 415 Hardware Security for AI Systems (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course provides a comprehensive introduction to cybersecurity principles with a focus on hardware security in AI-enabled systems. It covers the hardware foundations of modern AI platforms, including GPUs, TPUs, and specialized AI accelerators, and examines fundamental hardware security primitives. Students analyze threat models and attack surfaces specific to AI hardware, including hardware Trojans, supply chain vulnerabilities, side-channel attacks, and fault injection techniques. The course also explores trust mechanisms for AI devices, memory security, data protection strategies, and trusted execution environments for AI workloads. Emphasis is placed on hardware-aware defenses, secure AI accelerator design, and hardware–software co-design approaches to resilient system development. Emerging challenges and future research directions in securing next-generation AI hardware platforms are also discussed.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 334, AI 350
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Computer Organization, Embedded Systems, Machine Learning, Basic Digital Logic, and Programming in C / Python

Course materials

Required texts:

- *Hardware Security: Design, Threats, and Safeguards.* Tehranipoor, M., & Wang, C. (2012). Springer.
- *Security and Privacy in Machine Learning.* Shokri, R., & Shmatikov, V. (Eds.). (2023). Cambridge University Press.

Other Course Materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work. This will include lecture slides and lab manuals as they will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	Weight
Midterm Exam	25%
Final Exam	50%
Assignments	10%
Design Project	15%
Total	

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Cybersecurity and AI	Overview of AI system architectures and the unique cybersecurity challenges introduced by AI-driven and AI-enabled platforms.
2	Hardware Foundations for AI Systems	Fundamentals of digital hardware, processors, memory hierarchies, and AI accelerators that underpin modern machine learning systems.
3	Hardware Security Primitives	Core hardware-based security mechanisms such as secure boot, roots of trust, cryptographic modules, and physical unclonable functions (PUFs).
4	Threat Models and Attack Surfaces	Systematic analysis of attacker capabilities, threat modeling methodologies, and identification of hardware-level attack surfaces in AI systems.
5	Hardware Trojans & Supply Chain Risks	Design-time and fabrication-time hardware Trojan threats, detection techniques, and vulnerabilities across the semiconductor supply chain.
6	Side-Channel Attacks on AI Hardware	Various side-channel attacks targeting AI inference and training hardware.
7	Fault Injection Attacks	Various fault injection techniques and their impact on AI model integrity and system reliability.
8	Trust for AI Devices	Trusted computing concepts, device attestation, and establishing verifiable trust in edge and embedded AI platforms.
9	Memory Security and Data Protection	Secure memory architectures, encryption, access control, and protection of model parameters and sensitive datasets.
10	Trusted Execution for AI Workloads	Trusted execution environments (TEEs), confidential computing, and secure isolation of AI training and inference workloads.
11	GPU, TPU & AI Accelerator Security	Security vulnerabilities and protections specific to GPUs, TPUs, and domain-specific AI accelerators.
12	Defense, Co-Design & Future Topics	Hardware–software co-design strategies, hardware-aware AI defenses, and emerging research challenges in secure AI infrastructure.

Engineering Tools
Throughout the course project and assignments, students will gain experience using various free/open-source software vulnerability (static and dynamic) analysis tools.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master concepts.

Course Learning Outcomes (CLOs)
CLO 1 Explain the architecture of AI systems and identify hardware-level security risks across the AI–hardware stack.
CLO 2: Analyze hardware-based attacks on AI systems, including side-channel, fault-injection, and supply chain threats.
CLO 3: Develop basic threat models for AI platforms operating in edge, embedded, and cloud environments.
CLO 4: Evaluate hardware trust mechanisms such as secure boot, hardware roots of trust, and trusted execution environments for AI workloads.
CLO 5: Assess security vulnerabilities in GPUs, TPUs, and AI accelerators, particularly in shared and multitenant settings.
CLO 6: Propose hardware-aware and hardware–software co-designed defenses to improve the security and trustworthiness of AI systems.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 421 Cloud Vector Database Systems for AI (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
Vector databases (VDBs) have become a foundational component of modern AI systems, driven by the widespread use of large language models. Unlike traditional databases, VDBs are designed for high-dimensional similarity search and approximate query processing, prioritizing retrieval efficiency over strict transactional guarantees. This course presents a system-level and practical study of vector databases, covering embedding models and vector representations, similarity metrics, exact and approximate nearest neighbor search (ANNS), and vector query processing. Core indexing and retrieval techniques include inverted file indexing (IVF), graph-based ANN search (HNSW), product quantization (PQ), and hybrid approaches such as IVF-PQ and HNSW-PQ. The course also examines cloud and distributed V-DBMS architectures and the integration of VDBs with LLMs through Retrieval-Augmented Generation (RAG). A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 352
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Data Structures and Algorithms: Proficiency in algorithmic complexity analysis (Big-O notation), and familiarity with trees, graphs, and basic clustering or search concepts.
- Programming Experience: Working knowledge of C++ and/or Python, including understanding of memory management, file I/O, and object-oriented programming principles.
- Basic Mathematical and Analytical Skills: Comfort with linear algebra concepts (e.g., vectors and distances) and general analytical reasoning. Prior exposure to introductory machine learning concepts (e.g., K-means, k-NN, and PCA) is recommended but not required.

Course materials
Required Textbook: *Vector Databases: A Practical Introduction, 1st ed.*. Nitin Borwankar. O'Reilly Media

Grading Scheme

Assessment tool	Weight (UG)	Weight (G)
Individual Assignments	30%	30%
Project	N/A	30%
Midterm Exam	30%	N/A
Final Exam	40%	40%
Total	100%	100%

Graduate students complete a forward-looking course project in place of the midterm examination. This substitution reflects the advanced expectations at the graduate level, emphasizing system design, implementation, experimental evaluation, and deeper analytical reasoning.

Tentative Course Schedule

Week 1: Introduction, LLM Embeddings, and Vector Representations

- **Topics:** Week 1 introduces the motivation for vector databases and their role in modern AI systems. Topics include dense and sparse vector embeddings, embedding generation pipelines for text and documents, and common embedding models used with LLMs. Students study vector dimensionality, similarity and distance metrics (cosine similarity, Euclidean distance, inner product), and the implications of high-dimensional spaces, including the curse of dimensionality

Week 2: DBMS vs. V-DBMS: Transaction vs. Vector Retrieval

- **Topics:** Week 2 contrasts traditional relational and NoSQL DBMS designs with vector database workloads. Topics include SQL and NoSQL data models, ACID properties and MVCC, and why strict transactional semantics are often relaxed in vector retrieval systems. The week introduces hybrid query processing that combines metadata filtering with vector similarity search, highlighting design tradeoffs in “vector search + SQL” systems.
- Additional Readings: Pinecone VDB

Week 3: Cloud Vector Database Architecture

- **Topics:** Week 3 focuses on the architecture of cloud-based vector database systems. Topics include ingestion pipelines, index construction, storage layouts (in-memory, SSD, and hybrid designs), separation of control and data planes, metadata management, replication strategies, and failure handling. Students analyze architectural bottlenecks and scalability considerations in large-scale deployments.
- Additional Readings: VDB Tutorial (SIGMOD-Companion’24)

Week 4: Vector Query Processing and Exact Nearest Neighbor (ENN) Search

- **Topics:** Week 4 examines vector query execution pipelines and exact nearest neighbor (ENN) search as a baseline. Topics include brute-force similarity search, computational complexity analysis, memory bandwidth considerations, and the use of FAISS flat indexes. Students evaluate performance limitations of exact search at scale.

Week 5: Efficient Indexing I: Approximate Nearest Neighbor Search (ANNS) with IVF

- **Topics:** Week 6 introduces approximate nearest neighbor search using inverted file indexes (IVF). Topics include coarse quantization via clustering, assignment of vectors to partitions, query probing strategies, and tuning parameters such as the number of clusters and probes. Tradeoffs between recall, latency, and index build cost are analyzed.

Week 6: Midterm/Project Proposal

- **Topics:**
  - Undergraduate students take a midterm exam.
  - Graduate students submit their project proposals outlining a vector database related problem, system design goals, datasets, baseline methods, and evaluation metrics. Emphasis is placed on scoping, system-level contributions, and experimental methodology. Feedback is provided to refine project direction and feasibility.

Week 7: Efficient Indexing II: Graph-Based ANN and HNSW

- **Topics:** Week 7 covers graph-based ANN algorithms with a focus on Hierarchical Navigable Small World (HNSW) graphs. Topics include multi-layer graph construction, neighbor selection heuristics, greedy and beam search strategies, and parameter tuning. Comparisons between graph-based and partition-based indexing methods are discussed.

Week 8: Efficient Indexing III: Product Quantization and IVF-PQ

- **Topics:** Week 8 focuses on vector compression techniques for memory- and storage-efficient retrieval. Topics include product quantization, subspace decomposition, codebook construction, approximate distance computation, and hybrid IVF-PQ indexing. Students study accuracy–compression tradeoffs and performance at large scale.

Week 9: Retrieval-Augmented Generation with Vector Databases

- **Topics:** Week 9 explores the integration of vector databases with LLMs through Retrieval-Augmented Generation (RAG). Topics include RAG system architecture, document chunking strategies, hybrid retrieval, query rewriting, index freshness, and common failure modes such as retrieval mismatch and hallucination. End-to-end system performance considerations are emphasized.

Week 10: Cloud V-DBMS: Load Balancing and Scalability

- **Topics:** Week 10 examines scalability challenges in cloud vector databases. Topics include data and index sharding, query routing, replication for throughput, handling skewed workloads, and tail latency optimization. Students analyze how load balancing strategies impact retrieval performance and system reliability.

Week 11: Distributed Vector Databases and Emerging Trends

- **Topics:** This week studies distributed vector database designs and open research challenges. Topics include distributed ANN search, global versus local recall,

consistency–performance tradeoffs, multi-tenant systems, and emerging trends such as hybrid symbolic–vector databases, learned indexes, and vector support within traditional DBMSs.

- **Additional Readings:**
  - Harmony (SIGMOD'25)
  - Milvus (SIGMOD'21)

Week 12: Final Project Presentation

- **Topics:** Students present final projects demonstrating the design, implementation, and evaluation of a vector database system or application. Presentations emphasize system architecture, indexing choices, experimental results, and lessons learned from building scalable vector retrieval systems.

Assignments:

A1: Vector Embeddings and Exact Nearest Neighbor Search
A1 examines vector embeddings, similarity metrics, and exact nearest neighbor (ENN) search. Students analyze distance computations, high-dimensional effects, and the time and space complexity of brute-force vector search. Emphasis is placed on theoretical understanding and performance analysis.

A2: Approximate Nearest Neighbor Search and Indexing Techniques
A2 focuses on approximate nearest neighbor search (ANNS) algorithms, including IVF, HNSW, and product quantization (PQ). Students compare indexing structures, analyze algorithmic design choices, and reason about accuracy–latency–memory tradeoffs. Questions emphasize conceptual understanding and comparative analysis.

A3: Cloud Vector Databases and LLM-Based Systems
This assignment explores the integration of vector databases with LLM-based applications and cloud environments. Students analyze system architectures for cloud and distributed V-DBMS, including query processing, load balancing, and scalability challenges. Conceptual questions address Retrieval-Augmented Generation (RAG) and end-to-end system design considerations.

Projects:

The course project focuses on designing and implementing a vector database management system (V-DBMS) for large-scale similarity search. The project emphasizes system design, indexing algorithms, query processing, and scalability. Students may work individually or in teams of up to two.

M1: Query Interface and Single-Server V-DBMS. Students build a multi-client, single-server vector database manager that supports vector ingestion and similarity search through a defined query interface (e.g., REST or RPC). The system should support basic query execution and configurable similarity metrics.

M2: Vector Indexing Engines. Students implement and integrate at least two vector indexing methods chosen from IVF, IVF-PQ, HNSW, HNSW-PQ, ANNOY, or LSH. Indexes must be evaluated and compared in terms of recall, latency, and memory usage, highlighting tradeoffs between different ANN techniques.

M3: Cloud-Native and Distributed V-DBMS. Students extend their system to a distributed setting by supporting data or index partitioning, query routing, and basic load balancing across multiple nodes. The focus is on scalable architecture rather than full production-grade fault tolerance.

M4: Advanced Features and Extensions. Students add one or more advanced features that demonstrate creativity and deeper understanding, such as Retrieval-Augmented Generation (RAG), integration with LLMs, hybrid vector–SQL queries, or performance optimizations.

The project is evaluated based on system design, correctness, performance analysis, and clarity of documentation.

Engineering Tools
Students will be introduced to and utilize industry-standard and research-grade tools throughout the course, including:

- Vector Databases and Extensions: Systems such as Pinecone, Qdrant, Chroma, and vector extensions of traditional databases (e.g., PostgreSQL with pgvector).
- Indexing and Similarity Search Libraries: Libraries such as FAISS (Meta), Annoy, and HNSWlib for exact and approximate nearest neighbor search.
- Retrieval-Augmented Generation (RAG) Frameworks and Local LLMs: Frameworks such as LangChain and LlamaIndex, and lightweight local LLM runtimes including Ollama and LM Studio with models such as Llama 3 (8B), Mistral 7B, or Gemma.

Course Learning Outcomes (CLOs):
1. Understand vector representations, LLM embeddings, similarity metrics, and the challenges of exact and approximate nearest neighbor search in high-dimensional spaces.
2. Design and implement vector indexing and retrieval algorithms, including IVF, HNSW, product quantization (PQ), and hybrid approaches such as IVF-PQ and HNSW-PQ.
3. Analyze performance tradeoffs in vector search systems, including latency, accuracy, memory usage, and scalability.
4. Understand and evaluate cloud-native and distributed vector database architectures, including indexing pipelines, query execution, and load balancing.
5. Build and assess AI applications using vector databases, including Retrieval-Augmented Generation (RAG) and integration with LLM-based systems.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 424 Optimization for Machine Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
The constrained optimization problem for machine learning; Pareto optimality; KKT conditions for optimality; gradient descent, Newton's, and interior point algorithms; Lagrange duality; data statistics and pre-processing; applications to predictive analytics using time-series models, regression, and classification using neural networks, and support vector machines; applications to k-means clustering using Lloyd's algorithm. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 300
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

1. Basic knowledge of calculus, linear algebra, probability, and mathematical analysis
2. Working knowledge of MATLAB/SIMULINK or Python (for the project)

Grading Scheme

Assessment tool	Weight
2 midterm exams	33% + 33%% = 66%
Homework	9%
Project	25%
Total	100%

Tentative Course Schedule

Part I: Constrained Optimization

- Constrained optimization and Pareto optimality
- Karush-Kuhn-Tucker (KKT) necessary conditions of optimality
- Sufficient conditions of optimality
- Lagrange Duality

Part II: Numerical Algoritms

- Gradient descent method
- Newton's method
- Interior point algorithms

Part III: Applications to Machine Learning and AI

- Predictive analytics using time-series models

- Regression using neural networks
- Classification using neural networks and support vector machines
- k-means clustering using Lloyd's algorithm

Project Details
The project component of this course provides hands-on experience in designing a machine learning system for one of the applications discussed in class using data from a publicly available database.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **Python (PyTorch) or Matlab:** utilized for designing Deep Neural Network (DNN) models and extracting characteristics (e.g., weights and activations).
- **Matlab+cvx or Python+cvx:** used to solve optimization problems

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts:

1. formulate mathematically an AI-based optimization problem given a problem statement
2. classify AI-based optimization problems into convex and nonconvex programs
3. solve AI-based optimization problems subject to equality and inequality constraints
4. use steepest descent, Newton and interior point methods to find locally-optimal solutions
5. acquire working knowledge of neural networks, support vector machines and Lloyd's algorithm to solve predictive analytics, regression, classification, and clustering problems

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 425 Resilient AI in Safety-Critical Applications (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course provides an in-depth study of principles and technologies for designing and operating resilient Artificial Intelligence (AI) systems in safety-critical applications. Students examine the reliability, robustness, and security challenges posed by AI components integrated into domains such as industrial control, autonomous driving, smart grids, robotics, and other critical systems and services. The course focuses on resilience by design and resilience in operation against unintentional faults, misconfigurations, model drifts, data loss, hardware errors, network failures, and system-level disruptions. Topics include resilience engineering principles, AI failure modes, resilience metrics, architectural redundancy, fault injection and evaluation, reliability-aware model development, runtime monitoring, anomaly detection, adaptive mitigation, AI resilience in real-time and embedded systems, verification and validation, and safety standards and certifications for AI-integrated components and systems. Case studies from industrial safety-critical domains and recent research literature are integrated. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 380
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine Learning Fundamentals: Understanding of supervised and unsupervised learning, neural networks, model training and evaluation, overfitting, generalization, and basic optimization techniques.
- Probability and Statistics: Knowledge of random variables, probability distributions, and hypothesis testing.
- Programming Skills: Proficiency in Python and experience with at least one ML framework (e.g., PyTorch), and familiarity with simulation or data analysis tools.
- Computer Systems & Embedded Systems: Understanding of OS fundamentals, real-time constraints, embedded platforms, and system-level integration.
- Basic Cyber-Physical Systems Concepts (recommended): Understanding of sensing, actuation, communication, feedback control, stability concepts, and system-level interactions in engineering systems

Course materials
Recommended Textbooks

- Hollnagel, E., Woods, D. D., & Leveson, N. (Eds.). (2006). Resilience engineering: Concepts and precepts. Ashgate Publishing, Ltd.
- Nemeth, C. P., & Hollnagel, E. (2016). Resilience engineering in practice, Volume 2: Becoming resilient. CRC Press

Other materials

- Research Papers: A curated list of seminal papers to be posted on the course website.
- Software Tools: PyTorch.
- Lecture Slides: Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	40%
Design Project	40%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Resilient AI in Safety-Critical Systems	Overview of safety-critical domains (autonomous systems, smart grids, healthcare, industrial control); AI in cyber-physical systems (CPS); resilience vs. reliability vs. robustness; failure modes of AI-enabled systems.
2	Foundations of Resilience Engineering	Principles of resilience engineering; fault, error, failure taxonomy; redundancy and diversity; graceful degradation; resilience metrics (availability, MTBF, MTTR).
3	Failure Modes in AI-Enabled Systems	Data distribution shift; sensor/actuator faults; hardware errors; model drift; cascading failures; real-world case studies of AI system incidents.
4	Resilience by Design: Architectures and Redundancy	Architectural redundancy (spatial/temporal); ensemble methods for reliability; watchdog architectures; fail-operational vs. fail-safe design; diversity in models and sensing.
5	Fault Injection and Reliability Evaluation	Fault modelling (bit flips, sensor dropouts, timing faults); fault injection frameworks; stress testing; resilience benchmarking methodologies.
6	Reliability-Aware AI Model Development	Robust training under noisy data; uncertainty-aware models; calibration; out-of-distribution detection (non-adversarial); confidence estimation for safe decisions.
7	Runtime Monitoring and Anomaly Detection	Online performance monitoring; health monitoring of AI models; runtime verification; anomaly detection in system states; detection of abnormal operational behavior.
8	Adaptive and Self-Healing AI Systems	Dynamic reconfiguration; model switching; fallback control strategies; adaptive thresholding; recovery and re-learning strategies during operation.
9	AI in Real-Time and Embedded Systems	Timing constraints; real-time scheduling; edge AI deployment; resource constraints; hardware–software co-design for dependable inference.

10	Verification & Validation of AI-Infused Systems	Testing strategies for AI systems; coverage metrics; scenario-based validation; simulation environments; safety cases for AI components.
11	Safety Standards and Certification	Overview of standards (e.g., ISO 26262, IEC 61508); assurance arguments; traceability; hazard analysis (FMEA, FTA); regulatory considerations for AI-enabled systems.
12	Integrated Case Studies and Emerging Directions	Case studies in autonomous driving, smart grids, medical AI, or other applications; resilience trade-offs; system-level integration challenges; emerging research trends in resilient AI.

Project Details
The project component of this course provides hands-on experience in designing, implementing, and evaluating resilient AI systems for safety-critical applications. Students will develop and experimentally assess resilience mechanisms under realistic fault and operational scenarios using simulation and/or embedded platforms.

Project expectations:
- **Safety-Critical Use Case Definition:**
  Select a representative application (e.g., autonomous perception module, smart grid load forecasting, medical signal classification, industrial anomaly detection). Define operational requirements, safety constraints, and potential failure modes.
- **Baseline AI System Development:**
  Implement and train a machine learning or deep learning model (e.g., a CNN, RNN, or transformer-based model) in Python (e.g., PyTorch). Establish baseline performance metrics (accuracy, latency, resource usage).
- **Fault Modelling and Injection:**
  Design and implement fault models, such as sensor noise, missing data, distribution shifts, communication delays, or hardware-level perturbations (e.g., bit flips in weights/activations). Conduct systematic fault injection and quantify system-level impact.
- **Resilience-by-Design Mechanisms:**
  Incorporate architectural or algorithmic resilience strategies, such as redundancy (e.g., ensemble models, multi-sensor fusion), uncertainty estimation, confidence-based rejection, fallback logic, or graceful degradation. Compare with baseline behaviour.
- **Runtime Monitoring and Adaptive Response:**
  Develop runtime monitoring mechanisms (e.g., performance drift detection, anomaly detection on inputs/outputs, and health metric tracking) and implement adaptive mitigation strategies, such as model switching, threshold adaptation, or safe-fallback control.
- **Resilience Evaluation and Reporting:**
  Define resilience metrics (e.g., performance under fault, recovery time, degradation slope, availability). Perform quantitative analysis and discuss trade-offs among resilience, accuracy, latency, and computational cost.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:
- **PyTorch:** Used for developing and training AI models, implementing uncertainty-aware inference, and evaluating model performance under fault and distribution-shift conditions.

- **Python Scientific Stack (NumPy, SciPy, Pandas, Matplotlib):** For data preprocessing, statistical analysis, fault modeling, and visualization of resilience metrics (performance degradation, recovery time, confidence calibration).
- **Fault Injection Frameworks (e.g., PyTorchFI or custom fault injection tools): Used to simulate model-level and hardware-inspired faults such as bit flips, weight perturbations, sensor noise, or missing data, enabling controlled resilience evaluation.**
- **Simulation Environments (e.g., CARLA, Grid simulators, or CPS simulation platforms):** For modelling safety-critical operational scenarios such as autonomous driving, smart grids, or industrial processes, and evaluating the system-level impact of AI failures.
- **Runtime Monitoring & Logging Tools:** Implementation of health monitoring modules, anomaly detection pipelines, and performance drift detection using Python-based monitoring frameworks.
- **Docker or Virtual Environments:** For reproducible deployment, controlled experimentation, and testing of resilience mechanisms under consistent system configurations.
- **Testing & Verification Tools:** Unit testing frameworks (e.g., pytest), scenario-based simulation testing, and coverage analysis tools for validation of learning-enabled components.
- **Embedded/Edge Platforms (optional, depending on offering):** NVIDIA Jetson, Raspberry Pi, or similar platforms for evaluating real-time performance, resource constraints, and operational resilience in edge AI deployments.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Identify and analyze failure modes and operational risks in AI-enabled safety-critical systems, and quantify resilience metrics such as availability, degradation, and recovery time.
CLO 2: Design AI models and system architectures with resilience-by-design techniques, including redundancy, reliability-aware modelling, and fault-tolerant mechanisms.
CLO 3: Implement and evaluate resilience-in-operation strategies, such as runtime monitoring, anomaly detection, adaptive mitigation, and graceful degradation under realistic fault or operational scenarios.
CLO 4: Apply engineering and simulation tools (Python, PyTorch, fault injection frameworks, simulators) to experimentally assess and improve the robustness and reliability of AI systems.
CLO 5: Communicate engineering solutions effectively through structured technical documentation, reporting resilience analysis, experimental results, and system-level design trade-offs.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 431 Cloud AI and Distributed Machine Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the foundations and practice of cloud-based artificial intelligence and distributed machine learning. Students learn how modern AI workloads are trained, deployed, and managed across cloud and distributed computing platforms. Topics include cloud computing fundamentals, virtualization and containers, distributed data processing, parallel and distributed model training, model serving, orchestration, scalability, reliability, and security/privacy issues in cloud AI systems. The course includes hands-on work with contemporary cloud and ML tools.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 333 and AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Data Structures and Algorithms
- Probability/Statistics for Engineering or Computer Science
- Introductory Machine Learning or Artificial Intelligence
- Operating Systems or Computer Networks.

Course materials
Required Textbook: *Cloud Computing for Machine Learning and Cognitive Applications,* Kai Hwang (MIT Press), 1st Edition, 2017

In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- *Handson: Distributed Machine Learning Patterns* by Yuan Tang, Manning, 2023
- **Lecture Slides and Lab Manuals:** Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Assignments/Labs	30%
Midterm Exam	25%
Final Exam	25%
Course Project	20%
Total	

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Cloud AI and Distributed ML	What cloud AI is, why distributed ML matters, major application domains, overview of the course project
2	Cloud Computing Foundations	Cloud service models, public/private/hybrid cloud, compute, storage, networking, elasticity and multitenancy
3	Virtualization, Containers, and Microservices	VMs vs. containers, Docker basics, containerized ML environments, reproducibility
4	Distributed Storage and Data Processing	Distributed file systems, object storage, data pipelines, batch vs. stream processing, data locality
5	ML Workloads on Cloud Infrastructure	/GPU/TPU resources, scheduling, performance bottlenecks, training pipelines.
6	Parallel and Distributed Training	Data parallelism, model parallelism, synchronous vs. asynchronous training, communication overhead
7	Distributed ML Frameworks	Introduction to tools such as PyTorch Distributed, TensorFlow distributed strategies, Ray, Spark ML, or similar.
8	Model Deployment and Serving	Inference pipelines, REST/gRPC services, model packaging, latency vs throughput, autoscaling
9	Orchestration and MLOps Basics	Kubernetes basics, workflow automation, CI/CD for ML, experiment tracking, model versioning
10	Reliability, Monitoring, and Cost Optimization	Fault tolerance, observability, logging, resource utilization, cloud cost awareness
11	Security, Privacy, and Responsible Cloud AI	Access control, data confidentiality, model leakage, adversarial concerns, federated learning basics, ethics.
12	Emerging Topics and Project Presentations	Edge-cloud AI, distributed LLM serving/training overview, green AI, final project demos

Lab Details

The labs will progressively build practical skills:

- Lab 1: Dockerizing a simple ML application
- Lab 2: Running training jobs on cloud VMs or containers
- Lab 3: Basic distributed training experiment
- Lab 4: Deploying a model as a scalable service
- Lab 5: Monitoring and evaluating performance/cost
- Lab 6: Final mini-project milestone.

Possible Course Project Ideas

- Distributed image classification training pipeline
- Cloud-based smart-home anomaly detection system
- Scalable model serving for a chatbot or recommender
- Federated learning prototype for privacy-preserving analytics
- Cost-performance comparison of ML training across deployment choices
- End-to-end MLOps pipeline for a small AI application

Engineering Tools

Depending on available infrastructure, the course could use:

- Python
- PyTorch or TensorFlow
- Docker
- Kubernetes
- Ray or Spark
- GitHub Actions or similar CI/CD tools
- AWS Educate, Google Cloud credits, Azure for Students, or local servers at Concordia

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO1: Explain the fundamental concepts of cloud computing, including service models, virtualization, containerization, and distributed resource management
CLO2: Describe the architecture and workflow of cloud-based AI systems and distributed machine learning pipelines
CLO3: Apply appropriate tools and frameworks to package, deploy, and manage AI/ML applications in cloud environments
CLO4: Analyze and compare different approaches to parallel and distributed machine learning, including their scalability, communication cost, and performance tradeoffs
CLO5: Design and implement basic end-to-end cloud AI workflows involving data processing, model training, deployment, and inference serving
CLO6: Work effectively in teams to develop and communicate a practical cloud AI or distributed ML solution through reports, demonstrations, and presentations

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 432 Robot Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the principles and methodologies that enable robots to learn from interaction, data, and demonstrations. Topics include Markov Decision Processes, imitation learning, reinforcement learning, actor–critic and policy gradient methods, optimal control, deep model-based RL, inverse reinforcement learning, intrinsic motivation, robot simulation and sim-to-real transfer, and emerging vision- and language-based robot learning techniques. The course also integrates visual learning approaches for robot decision-making, including generative models and representation learning, reflecting the growing role of multimodal foundations in robotics. A term project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 300, AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine Learning Fundamentals: Supervised learning, optimization, neural networks.
- Probability & Stochastic Processes: Understanding of Markov chains, expectations, distributions.
- Programming Requirements: Python (PyTorch preferred), ability to work with simulation libraries (e.g. Isaac Sim).
- Control & Robotics Basics: Kinematics, dynamics, control fundamentals (helpful but not required)

Course materials
Recommended Textbooks:
- Sutton, R. S., & Barto, A. G. (1998). *Reinforcement learning: An introduction* (Vol. 1, No. 1, pp. 9-11). Cambridge: MIT press.
- Lapan, M. (2024). *Deep reinforcement learning hands-on*. Packt Publishing Ltd.
- Lynch, K. M., & Park, F. C. (2017). *Modern robotics*. Cambridge University Press. (for control background)

Other Course Materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- **Research Papers:** Key papers on imitation learning, deep RL, model-based RL, sim2real, visual learning for robotics, and foundation-model-based robotics.
- **Software Tools:**
  - PyTorch: for DNNs and RL algorithms.

- Robomimic, RLlib, stable-baselines3, or equivalent libraries

Lecture Slides and Lab Manuals: Will be posted weekly on Moodle.

Grading Scheme

Assessment tool	Weight
Midterm Exam	25%
Final Exam	40%
Design Project	35%
Total	100%

Tentative Course Schedule

Week 1. Intro to robot learning
Week 2. Markov Decision Process basics and imitation learning
Week 3. Reinforcement Learning basics for robot control
Week 4. Policy gradient methods, actor critic methods
Week 5. Optimal control and planning
Week 6. Deep model based RL
Week 7. Inverse RL
Week 8. Curiosity driven exploration
Week 9. Robot simulation and sim2 real
Week 10. Safe RL and safe robot learning
Week 11. Foundation models in robotics
Week 12. Case studies/hands on robot learning in simulation

Project Details
The final project is a practical investigation into a topic in robot learning. Students may work individually or in pairs and will propose, implement, evaluate, and present an end-to-end learning system.

Project expectations:

- Robot Learning Algorithm Implementation: Implement or extend an RL, imitation learning, or model-based method.
- Simulation-Based Experimentation: Use Mujoco, dm_control, Isaac Gym, or similar environments; evaluate performance under multiple condidtions
- Sim2Real Component (Optional/Bonus): Deploy on a real robot or include robustness analysis.
- Technical Report & Presentation: Document experiments, results, and engineering methodology.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- PyTorch: Neural network and RL algorithm development.

- Simulation Environments: Mujoco, PyBullet, Isaac Gym, Gymnasium, dm_control.
- RL Libraries: stable-baselines3, RLlib, Robomimic, or custom implementations.
- Visualization Tools: TensorBoard, Matplotlib, and robot trajectory tools

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Formulate robot learning problems using MDPs and apply imitation learning and RL methods
CLO 2: Evaluate and compare robot learning algorithms for stability, safety, and sample efficiency
CLO 3: Implement modern RL algorithms (e.g., PPO, SAC, TD3) for continuous robotic control
CLO 4: Apply model-based RL and sim-to-real strategies to improve robot generalization
CLO 5: Design, implement, and document a complete robot learning system through a final project

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 434 Distributed Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods are also studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students engage critically with current research through regular readings and presentations of recent papers. A final project is also required.

Components: Lecture 3 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Grading Scheme

Assessment tool	Weight
Assignments	15%
Exams	35%
Project	30%
Presentations	20%
Total	100%

Tentative Course Schedule

Week 1 : Introduction: Gradient Descent, Distributed Data Parallelism
Week 2 : Communication-Efficient Data Parallelism: Gossip, Local SGD, Communication Compression
Week 3: Federated Learning: Client Drift, Heterogeneity, Privacy, Personalization
Week 4 : Theoretical Analysis of Distributed Optimization
Week 5 : Model Parallelism 1: Pipelining, Tensor Parallelism, Context Parallelism
Week 6 : Model Parallelism 2: Sharded Parallelism, Implementations
Week 7 : Asynchrony and Communication Overlap
Week 8 : Recent Advances Federated Learning
Week 9 : Recent Advances Decentralized Learning
Week 10 : Recent Advances in Model Parallelism
Week 11 : Recent Advances in Asynchronous Methods
Week 12 : Final Project Presentation

Course Learning Outcomes (CLOs):
TBD.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 436 Deep Learning for Computational Pathology (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces deep learning in computational pathology, covering theory and practical experience. It includes diagnostic pathology and clinical applications, detailed exploration of digital pathology with high-resolution Whole Slide Image (WSI) acquisition, revisiting foundational deep learning principles, data gathering with domain expertise, preprocessing of WSIs, representation learning models from examining robustly supervised to minimally supervised tasks. Special topics in computational pathology will be emphasized on inductive bias, OOD, privacy-preserving learning, and foundational modeling. The course also delves into Computer-Aided Diagnosis (CAD) system development for clinical deployment and related challenges. Labs provide hands-on experience where students gain insights applicable to computational modeling of digital pathology images. Project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.
1. Sufficient knowledge from machine learning and deep learning topics
2. Data structure and algorithms
3. Python programming including libraries from Sklearn, Matplotlib, Numpy, Pillow, PyTorch
4. Calculus/Linear algebra topics from mathematics and Basic image processing concepts

Course materials
There is no specific textbook for this course. There will be series of papers, course slides, reports, GitHub repositories which will be assigned during the lecture for reading and preparation.

Grading Scheme

Assessment tool	**Weight**
Lab Assignment: three (3) lab assignments (programming exercises and reporting)	15%
Seminar Presentation: two (2) presentations with report submissions on selected papers	20%
Course Project (individually or in group of two): two progress report submissions	40%
Final Exam: project report submission and presentation by exam date	20%
In-class participation: engage in class discussions	5%
Total	100%

Grades will be based on five different modules. Each student will be assigned with Three(3) papers for critical review and reporting as the first assignment task. Student will write three-pages of review and criticise the papers in detail. According to the paper critiques, student will give a presentation to the class. Class discussion will be taken to account during presentation and will be accrued towards their participation mark. In addition, there are four lab assignments that will be reviewed during lab sessions and a submission is required for each lab. The course has a major project either done individually or in group. For groups more than two people, students require instructor's consent and the project is required to be more substantial. Students are required to submit a project proposal, two progress reports, a final report, and do a project presentation as their exam. Project presentations will be conducted on last session 12 and final exam session.

Tentative Course Schedule

Week	Lecture topic
1	Introduction to digital pathology: microscopy resolution, Whole Slide Imaging (WSI), preprocessing
2	Introduction to deep learning and computer vision: data processing, image encoders, optimization
3	Pathology medicine and clinical applications
4	Laboratory workflow in clinical pathology (site visit)
5	Computational Pathology-I: application design, data supervision, normalization, deep training process
6	Computational Pathology-II: patch- to slide- level encoding, self-supervision, foundation modeling
7	Special Topics in Computational Pathology: domain generalization, vision-language modeling
8	Seminar presentation-I: students presentations from paper collection(s) followed by report submissions
9	Seminar presentation-II: students presentations from paper collection(s) followed by report submissions
10	Seminar presentation-III: students presentations from paper collection(s) followed by report submissions
11	Seminar presentation-IV: students presentations from paper collection(s) followed by report submissions
12	Seminar presentation-V: students presentations from paper collection(s) followed by report submissions

Lab Details

The following lists the lab training and experiments.

- Introduction to digital Whole Slide Images (WSI) and viewing systems
- Introduction to Tissue Image Analysis (TIA) Toolbox
    - WSI reading and writing
    - WSI pixel-level pre-processing and filtering
    - WSI patch extraction
    - WSI tissue semantic segmentation
    - WSI registration
- Patch image classification

- Class object (e.g. nuclei) detection and segmentation
- Deep feature extraction from pretrained neural network models e.g. CNNs, ViTs
- Visualization techniques
- Classifier designs with self-supervised learning and downstream tasking

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following science engineering concepts:

Course Learning Outcomes (CLOs)
• familiarization with full concept of clinical pathology in relation to engineering science for developing meaningful diagnostic CAD tools for clinical practice and integration
• fully understand the digital pathology pipeline for whole slide tissue imaging, being able to view and process slide images for post-processing preparation in deep learning
• learning the necessary deep learning tools for developing useful tasks in computational pathology and understanding different deep learning models for representation learning tasks in whole slide imaging
• familiarization with different toolboxes for processing WSI data and related project development.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 441 MLOps: Machine Learning Operations (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
Machine Learning Operations (MLOps) focuses on the deployment, monitoring, and management of machine learning models in production environments. This course covers end-to-end model lifecycle operations, including Continuous Integration/Continuous Deployment (CI/CD) pipelines, versioning, model governance, and infrastructure automation using orchestration frameworks such as Docker and Kubernetes. Students learn how to design reproducible machine learning workflows, implement automated training and deployment pipelines, manage data and model versioning, and monitor model performance, drift, and reliability in real-world systems. The course emphasizes scalable architectures, testing strategies for ML systems and ethical model governance. Through a hands-on project, students build and deploy production-ready machine learning services, gaining practical experience with experiment tracking, containerization, API deployment, cloud-based infrastructure, and performance monitoring. By the end of the course, students are able to operationalize machine learning models efficiently, ensuring robustness, scalability, and maintainability in dynamic production environments.

Components: Lecture 3 hours per week

Prerequisites: AI 370
Co-requisites: N/A

Course materials
Required Textbook: *Designing Machine Learning Systems: An Iterative Process for Production-Ready Applications*. Huyen, C. O'Reilly Media, 2022

Other references:

- *Machine Learning Production Systems: Engineering Machine Learning Models and Pipelines* by Robert Crowe, Hannes Hapke, et al., 2024
- *Machine Learning System Design*: With end-to-end example by Valerii Babushkin and Arseny Kravchenko, 2025

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	45%
Project	35%
Total	100%

Tentative Course Schedule

Week	Topic
1	Introduction to MLOps and production machine learning systems
2	Reproducible machine learning workflows and experiment management
3	Data and model versioning for collaborative development
4	Design and implementation of end-to-end ML pipelines
5	Containerization and environment management for ML deployment
6	Serving machine learning models via APIs and microservices
7	Continuous integration and continuous deployment for machine learning systems
8	Orchestration and scaling with Kubernetes for ML workloads
9	Monitoring, observability, and performance management of ML Systems
10	Monitoring, observability, and performance management of ML Systems (cont.)
11	Advanced strategies for scaling ML systems in cloud and distributed environments
12	Governance and responsible AI in production systems

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Design and manage reproducible end-to-end ML pipelines
CLO 2: Deploy and scale ML models using containers and orchestration tools
CLO 3: Monitor and optimize ML model performance in production.
CLO 4: Implement CI/CD and automated workflows for reliable ML systems.
CLO 5: Apply governance, security, and ethical standards in MLOps.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 442 Explainable AI Engineering Process and Validation (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course provides an in-depth study of Explainable Artificial Intelligence (XAI) as a system-level engineering discipline within AI-intensive software systems. Students examine how explainability capabilities are designed, integrated, tested, validated, deployed, and monitored across the AI system lifecycle. The course emphasizes engineering processes, system invariants, testing frameworks, quantitative validation methodologies, performance profiling, computing cost estimation, and sustainability monitoring in cloud-native environments. Topics include explainability-by-design system patterns, architectural and system invariants, reproducibility and traceability engineering, testing strategies for XAI pipelines, quantitative explanation validation (fidelity and stability), performance benchmarking, multi-objective trade-off analysis, and sustainability-aware AI system governance. An engineering project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Software Engineering: System decomposition, modular design, API contracts, and software testing fundamentals.
- Machine Learning: Supervised learning, neural network fundamentals, model training and evaluation.
- Programming: Proficiency in Python; experience with ML frameworks preferred.
- Cloud Computing (recommended): Basic understanding of microservices and cloud-native architectures.

Course materials
Required Textbook: *Interpretable Machine Learning,* Christoph Molnar
Online Open Source accessible https://christophm.github.io/interpretable-ml-book/

Other course materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- Research Papers: Selected publications on explainable AI engineering, validation methodologies, system invariants, and sustainable AI systems.
- Software Tools: PyTorch, libraries for attribution analysis, MLflow (experiment tracking), Docker and Github Integration (continuous engineering), free-tier cloud services.
- Lecture Slides and Tutorial Notebooks: Posted weekly on Moodle.

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Three Assignments	30%
Final Exam	30%
Engineering Project	20%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1 Foundation	Foundations of Explainable AI Engineering	Taxonomy of interpretable machine learning; Feature attribution methods; Formal definitions of explanation fidelity and completeness; Role of explainability in high-stakes AI systems.
2 Foundation	AI Lifecycle and Process Integration	AI system lifecycle stages; explainability integration checkpoints; Documentation and governance processes; reproducibility requirements
3 Metrics	Quantitative Explanation Validation	Measuring Explanation Faithfulness; Sensitivity Analysis; Quantitative Benchmarks vs. Qualitative "Plausibility."
4 Design	Explainability-by-Design	System decomposition for XAI integration; Modular explanation services; Interface contracts for prediction and explanation APIs; fService Patterns for Explainable AI systems
5 Verification	System Invariants and Contract-Based Validation for XAI Systems	System Invariants in AI Systems; Specification of Explanation Requirements; Interface Contracts for Explanation Services; Invariant Assertion Checking; Runtime Verification Patterns
6 Verification	Continuous Testing Infrastructure for XAI	Unit, Integration, Regression Testing; GitHub and CI/CD Automation
7 Automation	Scalable Cloud Architectures for XAI	Microservice Orchestration for XAI; Handling "Long-Tail" latency in real-time explanation APIs
8 Systems / Validation	Sustainability Monitoring and Cost Estimation	Energy Consumption Modeling, GPU/CPU Utilization Analysis; Cloud Cost Estimation
9 Operations / Validation	Provenance and Traceability	Experiment Tracking; Data and Explanation Lineage Tracking
10 Operations / Validation	Robustness and Adversarial XAI	Stability Metrics; Sensitivity Analysis; Variance across Model Retraining; Adversarial attacks on XAI
11 Human / Decision	Human-in-the-Loop Engineering	Interactive Explainability; APIs for "Why" and "What-if" queries; User comprehension validation; Designing feedback loops to improve explanation compliance based on expert audit.
12 Synthesis / Decision	Trade-off and Multi-Object Optimization	Accuracy-Interpretability Trade-offs; Latency-Explanation Depth Trade-offs; Resource-aware Pareto Frontier Construction

Project Details
The project component of this course provides hands-on experience in engineering, validation and operate on Explainable AI.

Project expectations:

The core project objective is to move from "Explainability as an afterthought" to "Explainability as a System Requirement." Students will gain the skillset to

- **Engineer** a decoupled architecture that separates model inference from explanation generation.
- **Implement** rigorous quantitative metrics to mathematically verify explanation fidelity.
- **Enforce** system invariants through interface contracts (e.g., rejecting an AI output if its **Enforce** explanation is unfaithful).

Evaluate the operational trade-offs (latency, cost, and energy) of adding an explainability layer to a cloud native system.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **Programming and Core ML Frameworks:** Python, PyTorch, Scikit-learn
- **Interpretable Machine Learning and XAI Libraries:** SHAP, LIME, Captum, Alibi
- **Testing and Validation Infrastructure:** pytest, Assertion libraries for invariant enforcement, custom validation scripts for metric computation
- **Experiment Tracking and Reproducibility:** MLflow, Version control (Git), Configuration management (YAML)
- **API and System Integration Tools:** FastAPI, Docker, OpenAPI specification
- **Performance Profiling and Resource Monitoring:** Python profiling tools, PyTorch profilers, Memory usage monitoring tools, Basic cloud resource monitoring dashboards
- **Sustainability and Cost Estimation:** Cloud pricing calculators, GPU/CPU utilization monitoring tools, Energy estimation frameworks

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Design Explainability-Integrated AI Systems. Design AI systems that incorporate explainability as a structured system-level requirement, including modular explanation services, interface contracts, and lifecycle integration points.
CLO 2: Specify and Enforce System Invariants for XAI. Formulate specification requirements and system invariants governing prediction–explanation consistency, reproducibility, and service-level constraints, and implement assertion-based enforcement mechanisms.
CLO 3: Develop Testing and Quantitative Validation Frameworks Construct automated testing pipelines and apply quantitative explanation validation metrics (e.g., fidelity, stability, sensitivity) to evaluate explanation quality under controlled experimental conditions.
CLO 4: Analyze System Performance and Trade-offs. Evaluate the performance, scalability, and resource overhead of explainable AI systems, and conduct multi-objective trade-off analysis among accuracy, explainability, latency, and computational cost.

CLO 5: Assess Sustainability and Operational Cost of XAI Systems. Estimate computational cost and resource utilization of explanation pipelines, and propose sustainability-aware deployment strategies for explainable AI services in cloud-based environments

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 443 Embodied AI (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the principles and modern practice of Embodied AI, where intelligent agents perceive, reason, and act in physical or simulated environments. Using a simulation-first workflow, the course surveys core task settings (e.g., navigation, manipulation, and interaction) and the benchmarks and metrics used to evaluate embodied systems. Students learn how sensing and geometry (cameras, coordinate frames, proprioception, and basic sensor fusion) support spatial understanding, and how agents build and use representations such as occupancy maps, point clouds, scene graphs, and memory under partial observability. The course then develops learning-based decision-making foundations through reinforcement learning and imitation learning, before moving to current trends, including vision-language grounding, vision language model (VLM)-based planning with tool use, and vision-language-action (VLA) models for instruction-conditioned control. Finally, students study world models for prediction and planning (including video-based prediction and latent dynamics with imagination rollouts) and deployment-oriented topics such as runtime monitoring, reliability, observability, and failure analysis. By the end of the course, students are able to design and evaluate embodied agents, integrate perception and representation with learning and planning, and implement basic VLM/VLA- and world-model-enabled pipelines with robust evaluation and diagnostics.

Components: Lecture 3 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Course materials
Required Textbook: *AI for Robotics: Toward Embodied and General Intelligence in the Physical World*. Imran, Alishba, and Keerthana Gopalakrishnan. Apress, 2025

Other references:
- Sutton, Richard S., and Andrew G. Barto. Reinforcement learning: An introduction. Vol. 1. No. 1. Cambridge: MIT press, 1998.
- Selected papers from Robotics and ML conferences

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	40%
Project	40%
Total	100%

Tentative Course Schedule

Week	Topic
1	Embodied AI: tasks, benchmarks, and the agent loop. For example, POMDP intuition; short intro to navigation vs manipulation vs interaction; simulation-first workflow; datasets/benchmarks and what they measure
2	Sensors for Embodiment: cameras, camera model, coordinate frames, proprioception, sensor fusion
3	Representation of Space: occupancy maps, point clouds, scene graphs; implicit representations (high-level intuition); object-centric vs scene-centric; short-term vs long-term memory
4	Reinforcement Learning Foundations (for embodied settings)
5	Imitation Learning for Embodied Tasks
6	Vision-language grounding for embodied tasks: grounding language in perception; segmentation/detection as “grounders”; evaluation of grounding
7	VLMs as planners: plan-then-act + tool use. For example, VLM prompting for subgoals; constraint-aware planning (collision, reachability); tool APIs (map, detector, motion primitive library)
8	Vision-Language Action models
9	World Models and Prediction I: predictive learning; video prediction as world model
10	World Models and Prediction II: latent dynamics; imagination rollouts; model predictive control with learned models
11	Monitoring and runtime reliability in Embodied AI systems
12	Observability and failure analysis for Embodied AI

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Formulate and evaluate embodied AI problems.
CLO 2: Build perception- and geometry-aware embodied pipelines.
CLO 3: Develop learning-based embodied decision makers.
CLO 4: Integrate language into embodied intelligence.
CLO 5: Use prediction and reliability methods for deployment.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 449 Machine Learning Theory (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces students to some fundamental concepts and techniques at the mathematical foundations of machine learning (ML). Students learn how to apply simple but reasonable approximations of complex high-dimensional models to obtain deep insights into non-trivial phenomena like neural scaling laws, multiple descent, and model collapse. The course also highlights open research problems.

Components: Lecture 3 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Course materials
Recommended Textbooks:

- *Elements of Statistical Learning,* by Jerom Friedman, Robert Tibshirani, and Trevor Hastie
- *AI by Hand,* by Tom Yeh
- *Learning from First Principles,* by Francis Bach
- *High-Dimensional Statistics: A Non-Asymptotic Viewpoint,* by Martin Wainwright
- *High-dimensional Probability,* by Roman Vershynin

Grading Scheme

Assessment tool	Weight
Assignments	30%
Paper review and presentation	10%
Quizzes	20%
Final exam	20%
Research projects	20%
Total	100%

Tentative Course Schedule

Week 1. Mathematical Preliminaries

- Matrices, eigenvalues, eigenvectors, and the SVD
- Laws of Large Numbers, Central Limit Theorems
- Markov, Chebychev, Hoeffding and Bernstein inequalities
- High-dimensional geometry of random vectors

Week 2. Linear Models

- Ordinary-Least Squares (OLS) regression
- Ridge regression
- Bias-Variance decomposition (formula for test error)

Week 3. Random Matrix Theory for ML

- Motivation

Week 3. Random Matrix Theory for ML
• Motivation
• The Stieltjes transform
• The Marchenko–Pastur Law
• High-dimensional analysis of linear regression (exact formula for limiting test error)

Week 4. High-dimensional classification problems
• Recap of basic concepts in convex analysis (Fenchel-Legendre conjugates, dual norms, etc.)
• CGMT (Convex Gaussian Min-max Theorem)
• Exact analysis of logistic classification in high-dimensions

Week 5. Neural Scaling Laws
• Kaplan laws
• Compute-optimal (Chinchilla) scaling laws
• Provable neural scaling laws for associative memories
• Provable neural scaling laws for high-dimensional regression
• Beating neural scaling laws via data-pruning

Week 6. Model Collapse
• Synthetic data: the good, the bad, and the ugly
• Model collapse in mean estimation
• Model collapse in LLMs: empirical results
• Model collapse in toy language model

Week 7. Free Probability Theory for ML
• Crash course on SymPy
• Linear pencils
• R-transform and fixed-point equations
• Marchenko–Pastur Law (again!)

Week 8. Analysis of Covariate-Shift in High-Dimensions
• Linear setting
• Random features model

Week 9. Model Collapse (continued)
• Model collapse in the regression setting
• Mitigation strategies: pruning, mixing, accumulation, etc.
• Strong model collapse
• Open problems

Week 10. Theory of Adversarial Examples
• The strangeness of high-dimensional geometry
• Spurious features and adversarial examples
• Strong negative results (No Free Lunch theorems)
• Memorization and robustness

Week 11. A Theoretical Glimpse at Transformers
• Introduction to self-attention (SA)
• In-context multi-task regression via SA
• Some theoretical results

Week 12. A Few Open Problems
• Reconciling explainability and privacy
• Pitfalls of alignment in LLMs
• Length-generalization in LLMs
• The mystery of chain-of-thought in LLMs
• Adversarial examples: the case of LLMs

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
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On Campus Resources
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AI 454 Quantum Machine Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
As classical computing approaches its physical limits, a new frontier of computation is emerging. This course provides a formal introduction to the intersection of quantum information theory and machine learning. Students rigorously examine the geometry of quantum states, the complexity of quantum kernels, and the theoretical speedups offered by quantum algorithms. Topics include the quantum circuit model, quantum feature mapping, and quantum optimization. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 300, AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics:

- Linear algebra: Proficiency in vector spaces, complex numbers, orthonormality, matrix operations, and especially Eigenvalues/Eigenvectors.
- Probability and Statistics: Understanding of expectation values and probability distributions.
- Classical Machine Learning: Understanding of kernel methods and neural networks.

Course materials
Required textbook: *Quantum Machine Learning: A Hands-on Tutorial for Machine Learning Practitioners and Researchers*; Yuxuan Du, Xinbiao Wang, Naixu Guo, Zhan Yu, Qian Yang, Kaining Zhang, Min-Hsiu Hsieh, Patrick Rebentrost, and Dachen Tao; ArXiv: 2502.01146, 2025

Other course materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- Research Papers: A curated list of seminal papers including the QSVM paper, VQE paper, and Quantum Enhanced Feature Space paper.
- Software Tools: Qiskit**:** For implementing quantum neural network.
- Lecture Slides and Lab Manuals: Will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	**Weight**
3 Assignments	60% (or 20% each)
Final project	40%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Quantum computing	History of quantum computing; Shor's algorithm, Grover's algorithm, and HHL algorithm.
2	Review of the necessary mathematical background	Review of linear algebra and basic probability theory.
3	Mathematical formalism of quantum information I	Qubit, quantum states, unitary operation, and measurements.
4	Mathematical formalism of quantum information II	Density matrix and Bloch sphere, general measurements, partial trace, and quantum circuits.
5	Quantum linear algebra	Block encoding, basic arithmetic for block encodings, and quantum singular value transformation.
6	Quantum kernel methods I	Classical kernel methods, quantum feature encoding.
7	Quantum kernel methods II	Quantum kernel machines and their designs.
8	Quantum kernel methods III	Theoretical foundation of quantum kernel methods: expressivity and generalization. Code demonstration.
9	Quantum Neural Network I	Classical neural network, and quantum variational circuits.
10	Quantum Neural Network II	Quantum perceptron and Grover's algorithm. Discriminative learning with QNN and Generative learning with QNN.
11	Quantum Neural Network III	Code demonstration: quantum classifier and quantum GAN.
12	Final project presentation	Quantum ML application demonstration

Project Details

The project component of this course provides hands-on experience in applying Quantum ML methods to real-world applications.

Project expectations:

- **Problem Justification:** Identifying a specific dataset and articulating why a quantum approach (e.g., high-dimensional feature mapping) is theoretically relevant.
- .**Technical Implementation:** Coding a functional model using **Qiskit** or **PennyLane** that includes data encoding, a parameterized quantum circuit (PQC), and a classical optimization loop.
- **Comparative Analysis:** Evaluating the quantum model against a classical baseline (like a standard SVM or MLP) and documenting the impact of circuit depth and qubit scaling.
- **Critical Reflection:** A detailed discussion on hardware constraints, such as the effect of **Barren Plateaus** or device noise on the training landscape.

Engineering Tools

Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **Quantum Development Kit:** PennyLane, Qiskit, and Cirq/TensorFlow Quantum.
- **Scikit-learn:** Essential for establishing classical baselines
- **PyTorch / JAX / TensorFlow:** Used to handle the "classical" half of the hybrid loop—updating weights, backpropagation, and data preprocessing..
- **Qiskit Aer / Lightning (PennyLane):** High-performance simulators that mimic quantum noise. For complex projects, students may need **GPU-accelerated simulators** (like NVIDIA's cuQuantum) to handle more than 20 qubits.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts:

CLO 1: Learn the foundations of quantum information and computation.
CLO 2: Implement and compare different encoding methods to encode classical data into quantum states.
CLO 3: Design, simulate, and optimize Variational Quantum Circuits (VQCs) and Quantum Neural Networks (QNNs).
CLO 4: Identify and mitigate common hurdles in current hardware, specifically Barren Plateaus and hardware-induced decoherence/noise.
CLO 5: Perform rigorous comparative analysis between QML models and classical benchmarks using standard metrics.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 459 AI for Media and Content Delivery Networks (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
The course introduces the key concepts involved with AI-driven networked multimedia systems. Topics include concepts of generating, delivering, and consuming multimedia content. The course explores and covers data-driven techniques and artificial intelligence optimizations (such as deep reinforcement learning, (un)supervised learning and machine learning) that improve the performance, efficiency, and robustness of networking and multimedia system applications. The course introduces the theory and principles in coding, packaging, and securing multimedia data, with a focus on methods for reliable and scalable transport over IP networks for video streaming applications such as: one-way streaming (i.e., video-on-demand and live streaming), two-ways streaming (i.e., video conferencing), and 3D volumetric streaming applications. The course discusses best practices in network and operating system support for media delivery, and the state-of-the-art in current deployments. Additionally, special topics on LLM serving for networking and multimedia systems, reinforcement learning-guided video streaming, ML-based video telephony, Neural volumetric media compression and delivery, AI-enabled Internet protocols for media delivery, ML-based congestion control, AI for next-generation networks and technologies, ML in resource-constrained environments, video analytics, green ML-based communication. A project is required.

Components: Lecture 3 hours per week; Lab 3 hours per week

Prerequisites: AI 330 or AI 336
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine learning fundamentals
- Python programming

Grading Scheme (Undergraduate)

Assessment tool	**Weight**
Implementation Assignments (2)	20%
Paper Summary & Discussions	20%
Quizzes (4)	20%
Course Project (Engineering & Implementation focus)	40%
Total	100%

Tentative Course Schedule

Class Format (3 Hours total): To accommodate students without a networking background, the class is divided into two distinct parts:

• Hour 1 (Instructor Background Lecture): Foundational networking and multimedia systems concepts are taught to prepare students for the following week's AI applications.

• Hours 2 & 3 (Student Presentations & Implementations): Students present practical implementations and engineering papers applying AI techniques to the background material covered in the previous week

Week	Hour 1: Instructor background lecture (preparing for next week)	Hours 2 and 3: Student presentations (AI optimizing last week's background)
1	Course Intro & Multimedia Provisioning: Fundamentals of video coding and generating multimedia content	Course Overview & AI in Systems Instructor overview of syllabus and AI trends. (No student presentations yet).
2	Multimedia Delivery: Video streaming pipelines for various applications	Topic: Neural Media Compression & AI optimizations for video coding
3	Multimedia Playback: Adaptive Bitrate (ABR) logic, throughput estimation, and Quality of Experience (QoE) metrics	Topic: ML-Driven Multimedia Delivery & Pipeline Optimizations
4	Transport Protocols: How TCP, UDP, and QUIC work. Understanding QoS metrics (packet loss, throughput, delay, congestion).	QUIZ 1 Topic: Reinforcement Learning (RL)-guided Video Streaming Playback & Super resolution Optimization
5	Routing Protocols & Architectures: Intra/Inter-domain routing (OSPF, BGP) and 5G/6G network technologies	Topic: AI-Enabled Internet Protocols & ML-based Congestion Control
6	Network Resource Allocation & Scheduling: System bottlenecks, bandwidth allocation, and fairness	QUIZ 2 Topic: AI for Next-Generation Networks, Technologies, & Routing
7	Network Queue Management: Buffer bloat, dropping algorithms (DropTail, RED).	Topic: ML for Network Resource Allocation & Intelligent Scheduling.
8	Datacenter & Distributed Systems: Infrastructure for massive workloads (LLM training and inference).	Topic: ML-based Active Queue Management & Green ML-based Communication
9	Video Analytics & Processing Pipelines: Edge-to-cloud offloading and computer vision workloads	QUIZ 3 Topic: LLM Serving for Networking & AI-based Networking optimization for LLM
10	Video Conferencing: Mechanics of WebRTC, strict latency constraints, and jitter	Topic: AI-Driven Video Analytics over Networks
11	Edge Computing: Distributed compute paradigms and hardware constraints	QUIZ 4 Topic: ML-Based Video Telephony & Robustness
12	Course Wrap-up:	Topic: ML in Resource-Constrained Environments (Edge) & Course Project

	Synthesis of networking protocols, constraints, and Project presentation	Presentations

Monitoring Details
Monitoring sessions will be held for 2 hours each week, guided by senior PhD students who will assist in the completion of course implementation assignment and project. Students are expected to bring and use their laptops during the sessions.

Engineering Tools
Networking tools, Multimedia tools, AI tools, Systems tools.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

A. Demonstrate a comprehensive understanding of AI-driven techniques and their practical application in optimizing multimedia systems.
B. Understand multimedia content generation, delivery, and underlying networking protocols.
C. Apply existing AI techniques to optimize the performance, efficiency, and robustness of video streaming applications.
D. Analyze modern AI-driven networked multimedia systems and understand how contemporary AI tools address practical engineering challenges.
E. Develop a hands-on project that applies AI-based optimizations to multimedia systems, demonstrating the ability to design, implement, and validate a scalable engineering solution.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 469 Conversational Artificial Intelligence (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces key concepts related to Conversational AI, covering both theoretical and practical aspects. The lectures provide a general overview of modern conversational AI systems. The review covers basic machine learning concepts used in Conversational AI, including speech processing techniques. The course addresses Large Language Models and Multimodal Large Language Models which are an essential part of modern conversational AI methods. The lectures are designed to provide a complete overview of the field of Conversational AI. A project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:

- Strong Python programming skills.
- Good knowledge of linear algebra, calculus, and math in general.
- Basic knowledge of neural networks, and deep learning.
- Basic knowledge of PyTorch

Course materials
Suggested textbooks:

- *Deep Learning*, Christopher Bishop and Hugh Bishop
- *Deep Learning,* Ian Goodfellow, Yoshua Bengio, and Aaron Courville, 2016
- *Dive into Deep Learning*

Additional reading materials, such as scientific articles, blog posts, and videos will be suggested at the end of each lecture.

Grading Scheme

Assessment tool	**Weight**
Project	30%
Midterm Exam	30%
Final Exam	30%
Lab Assignment (1% each, best 10 of 12)	10%
Total	100%

Tentative Course Schedule

Week	Lecture topics	Extra material	Lab to topics
1	Introduction to Conversational AI		Exercises with PyTorch
2	Foundations of Modern Deep Learning	Deep Learning Tips and Tricks (Part 1)	Deep Learning with PyTorch
3	Sequence Learning	Deep Learning Tips and Tricks (Part 2)	Attention Mechanisms
4	Transformers	Self-supervised Learning	Transformers
5	Language Models		Language Models
6	Large Language Models (LLMs)		Language Models (from scratch)
7	Mid-term Exam		
8	LLM Adaptation	Speech Features	LLM adaptation
9	Agents and Reasoning	Speech Recognition	Reasoning
10	Advanced LLM Architectures	Advanced Speech Recognition Techniques	Mixture of Experts
11	Multimodal LLMs		Audio Tokens
12	Recent Trends and Open Challenges		

Lab Details
The lab sessions will be held in person as well. Students are strongly encouraged to attend labs carefully. The topics addressed during the labs can be objects of question in the mid-term and final exams. Labs are a major learning opportunity in this course, in terms of practical skills and understanding how the algorithms work. During the lab section, the instructor will typically do some practical tutorials on the week's topic. Then, the instructor will introduce the lab assignment of the week. The lab will be made available at the beginning of the week. You are thus encouraged to start solving the lab even before your lab session. This way you can take advantage of the lab session to ask clarification questions to the TA. Note that the lab assignment will require some hours to be solved and cannot be completed during the lab session (you will likely need to conclude this at home). You have until the end of the week to submit the final lab assignment in Moodle. We will do our best to grade the lab as soon as possible to provide feedback to the students. For this reason, we cannot grant any extensions to the deadlines. There are 12 labs worth 1% each up to a maximum of 10% of the total grade. This means that you can skip two labs without any score penalization.

Notes:
- You must attend your assigned lab section ONLY. Please respect this rule, it helps balance work among the TAs and keeps them organized.
- Students are encouraged to help each other with labs verbally, but copying code is forbidden. You must be the author of all your submitted answers. Violations will be reported.
- Do not copy past solutions that you can find online or use LLMs to solve the lab. Violations will be reported.
- You have to submit the lab assignment according to the deadline specified by the instructor. Extensions cannot be granted. Late submissions will not be graded.

Details on assessment tools:

Project

The project is an important part of the machine learning course. The goal of it is to show that you gained familiarity with the conversational AI techniques explained during the lecture and labs and that you can implement an actual model. The project grade counts as 30% of the final grade.

The instructor will make available some project proposals in the first weeks of the course. As an alternative, students are welcome to propose a project. In this case, the students have to write a project proposal (max two pages) and submit it before the deadline for a project proposal. The instructor will review it and must explicitly approve it (on Moodle). The instructor might ask you to fine-tune the proposal (or write another proposal) if the project does not meet the expectations (e.g, the project is too similar to one of the labs, the project is unfeasible with the current time and computation constraints, the proposal is not clear, etc).
The project must be individual work done by the student (no group projects). Students are welcome to meet, exchange opinions, and suggestions, share issues, etc when working on their projects. However, the project must be the individual work of the students. Every violation will be reported. Each student will be assigned to a project advisor. The project advisor will monitor the evolution of the project and provide some suggestions along the way. Nevertheless, the project advisor is not supposed to solve the problem or debug the code for you.
Further details are available in the Project guidelines on Moodle.

Exams

We plan to do a mid-term exam that will focus on the topics of the first 6 lectures, labs, tutorials, and extra lecture. A final exam will be done at the end of the course on the topics addressed in the last 5 lectures and labs. The exams will be quizzes composed of different questions (ranging from simple to more challenging ones).

Course Learning Outcomes (CLOs): TBD

Health and Safety Guidelines
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On Campus Resources
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AI 470 Engineering AI-Based Software Systems (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces key concepts related to the engineering of AI-based software systems. Topics include requirements and architectures of AI-based software systems, data validation and management, model selection, quality assurance, deployment and continuous delivery of AI-based software systems. Additionally, special topics on interpreting and monitoring models, and operations in large-scale AI based system are included. A course project involving a real-world open-source AI-based software system is required.

Components: Lecture 3 hours per week

Prerequisites: N/A
Co-requisites: N/A

Course materials
Suggested textbook: *Building Intelligent Systems: A Guide to Machine Learning Engineering*. Geoff Hulten. 2018.

Many resources for the course (lecture slides, assigned readings, example projects, etc.) will be available on the course Moodle page.

Grading Scheme

Assessment tool	Weight
Class participation	10%
Paper critiques & activities	20%
Project proposal	10%
Research project	40%
Quizzes and exams	20%
Total	

Tentative Course Schedule

Week	Topic
1	Introduction & overview
2	AI for Software Engineers
3	Software requirements and architectures for AI-based systems
4	Data validation and management
5	Interpretation vs. Explanation
6	Project updates (student presentations)
7	Deployment and testing (MLOps)
8	Technical Debt in AI-based systems
9	LLMs in AI-based systems
10	Continuous delivery

11	Quiz
12	Project presentations (student presentations)

Details on assessment tools:

Class Participation

Students are expected to attend all classes. In each class, we will have discussions based on the assigned readings. Students are expected to participate and make meaningful contributions to these discussions.

Research Proposal and Project

A large portion of the course deliverables is a course research project. You are expected to work on the course project in groups. Each group is expected to write a research paper by the end of the semester. The topic is to be determined with the instructor. Examples include a new contribution on a specific related topic, a survey paper of a related topic (typically involves surveying 30 – 60 papers), or building a tool to support the engineering of AI-based software systems.

The first deliverable of the course project is a project proposal. The project proposal should be 3 pages in length (plus references). The project proposal should be submitted by the end of week 6. A project progress presentation will be held in week 6. The final project will be presented in week 12 and the final project report (10 pages in length) should be submitted by the end of week 12. The final submission is expected to be of publishable quality. All project-related documents (i.e., project proposal and project report) should use the IEEE conference publication format. If the paper is deemed publishable, the instructor will work with the students to make appropriate changes to the final report and submit the paper for publication.

Course Learning Outcomes (CLOs): TBD

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 472 Generative AI for Software Engineering (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces key concepts about using Generative AI (GenAI) in software engineering practice and research. The course includes sessions on the topics of prompt engineering and fine-tuning Large Language Models for software engineering research. Subsequently, the course focuses on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, the course covers special topics related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of GenAI. A project is required.

Components: Lecture 3 hours per week; Laboratory 1 hour per week

Prerequisites: AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Understanding of the Software Engineering lifecycle
  - Software requirements
  - Software design and development
  - Software testing and maintenance
- Basic understanding of Machine Learning
  - Training supervised machine learning models.
- Programming logic

Course materials
Required Textbook: *AI Engineering: Building Applications with Foundation Models. 1st ed.* Huyen, C. 2024. O'Reilly Media, Sebastopol, CA

Grading Scheme

Assessment tool	Weight
Class participation	10%
Lab Assignments	15%
Paper Reviews	15%
Quiz	20%
Course project	40%
Total	100%

Tentative Course Schedule

Week	Topics
1	Introduction to GenAI in Software Engineering
2	Prompt Engineering for Practitioners and Researchers
3	Embedding SE Expertise in Foundational Models (RAG, Agents)
4	Experiment Design for Software Engineering Studies with GenAI
5	GenAI applied to Software Requirements
6	GenAI applied to Software Design
7	GenAI applied to Software Development
8	GenAI applied to Software Testing
9	GenAI applied to Software Maintenance and Repair
10	Special topics: Engineering Agentic Systems
11	Quiz
12	Final Project presentation

Details on assessment tools:

Lab Assignments

Each week, the lecture will be complemented by a 1-hour laboratory session, equipped with prepared materials to guide students in running experiments with LLMs for software engineering research.

Project description

Undergraduate students will develop an LLM-based solution for software engineering practitioners and write a detailed report on the process.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following concepts.

- Comprehend GenAI Foundations. Explain the fundamental principles, capabilities, and evolution of Generative AI and Large Language Models (LLMs), specifically within the context of software engineering.
- Apply Domain-Embedding Techniques to LLMs. Apply specific techniques (e.g., as Prompt Engineering, RAG and Fine-tuning) to optimize off-the-shelf LLMs for domain-specific software tasks.
- Understand the Challenges of Developing GenAI-based Systems. Design and evaluate strategies for implementing and deploying software systems that contain GenAI components.
- Evaluate Risks and Ethics. Critically assess the limitations and risks associated with LLMs (e.g., non-determinism, lack of transparency/explainability) and analyze the ethical and societal implications of deploying these tools in professional practice.Learn Fundamentals of SE Research. Understand the different types of study designs, and scientific methodology for research the application of GenAI to SE tasks.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 474 AI-Driven Software Improvement and Repair (4 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems.

Components: Lecture 3 hours per week; Laboratory 1 hour per week

Prerequisites: AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Students should know to program in one of the common programming languages, e.g., Java or Python. Basic concepts on software development process, debugging and testing are required.

Course materials
The reading materials include research papers and articles.

Grading Scheme

Assessment tool	Weight	Notes
Class Participation	10%	Each week, students are expected to participate in the paper discussions when applicable
Lab assignment(s)	20%	Students are required to finish lab assignments that cover relevant techniques on AI-driven software improvement and repair that are taught in the course.
Course project	40%	Each group of students needs to submit an original 10-page project report in either IEEE or ACM double column format.
Exam	30%	
Total	100%	

Tentative Course Schedule

Week	Topics
1	Software Improvement and repair: an overview on background and history
2	Bugs, errors, and failures
3	Fault localization
4	AI-assisted fault localization
5	Automated program repair
6	History-driven and AI-assisted automated program repair
7	Benchmarks, evaluation, and reflection
8	Project proposal presentations
9	AI-driven software improvement and repair
10	Fairness and trust
11	In-class final
12	Final project presentations

Lab Details
Lab topic 1: IR-based fault localization
Lab topic 2: Classic automated program repair
Lab topic 3: Learning-based repair with LLMs
Lab topic 4: LLMs for automated software refactoring.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

Appendix 3: Surveys and market analysis data

This appendix includes the following:

1. Industry expert survey questionnaire and results
2. Undergraduate student interest survey questionnaire and results
3. CEGEP student Open House survey questionnaire and results
4. AI specialist job postings analytics for Canada and Quebec

Industry Experts Survey Questionnaire

Undergraduate AI Program Industry Survey

Q1



Thank you for participating in this survey. Your insights will help us design two new undergraduate programs in Artificial Intelligence at Concordia University's Gina Cody School of Engineering and Computer Science:

- Bachelor of Engineering (BEng) in Artificial Intelligence Engineering
- Bachelor of Science (BSc) in Artificial Intelligence

The survey should take approximately **15–20 minutes** to complete.

Q2

Name

Q3

Current job title

Q4

Organization

Q5

Which of the following best describe(s) your core responsibilities? (Select all that apply.)

- [ ] Executive / Senior management
- [ ] People / Talent management
- [ ] Engineering / Development
- [ ] Data / AI / ML / Analytics
- [ ] Product management
- [ ] Research / R&D
- [ ] Operations
- [ ] Other (please specify):

Q6

Sector: Which sector best describes your organization? (Select one.)

- ○ Aerospace
- ○ Automotive / Transportation / Logistics
- ○ Robotics / Industrial Automation
- ○ Telecommunications
- ○ Manufacturing (including advanced / high-tech manufacturing)
- ○ Energy / Utilities
- ○ Construction / Civil / Infrastructure
- ○ Mining / Natural Resources
- ○ Agriculture / Agri-tech
- ○ Medical Devices / Healthcare Technology / Hospitals
- ○ Software / ICT / AI Products and Services
- ○ Finance / Insurance / Fintech
- ○ Defense / Security / Public Safety
- ○ Government / Public Sector / Crown Corporation
- ○ Specialized Engineering Consulting / R&D Services
- ○ Other (please specify):

Q7

What is the size of your organization (globally)?

- ○ 1–9 employees
- ○ 10–99 employees
- ○ 100–999 employees
- ○ 1,000–9,999 employees
- ○ 10,000+ employees

Q8

Concordia University's Gina Cody School is developing two new undergraduate programs in Artificial Intelligence:

- **Bachelor of Engineering (BEng) in Artificial Intelligence Engineering** – focused on designing and building AI-enabled systems (software, hardware, robotics, data, infrastructure), designed to meet CEAB engineering accreditation requirements
- **Bachelor of Science (BSc) in Artificial Intelligence** – focused on algorithms, theory, and hardware/software for AI, with fewer engineering core courses and more room for technical and general electives

Both programs share a strong AI core and address ethics, safety, security, fairness, and explainability in AI systems.

Q9

Future demand: How do you expect demand for AI-related roles in your industry to change over the next 5 years?

- ○ Increase significantly
- ○ Increase somewhat
- ○ Remain about the same
- ○ Decrease somewhat
- ○ Decrease significantly
- ○ Unsure

Q10

Existing AI job titles: What job titles in your organization currently require AI-related knowledge and skills? (e.g., ML Engineer, AI deployment, Data Scientist, AI Product Manager) (Optional)

Q11 ✶

Need for training / upskilling: How would you assess the need for training and skill updating in AI-related roles within your organization?

- ○ No need
- ○ Low need
- ○ Moderate need
- ○ High need
- ○ Critical need

Q12 ✶

Hiring difficulty for AI roles: Does your organization face challenges in recruiting skilled professionals for AI-related roles?

- ○ Yes
- ○ No
- ○ Unsure

Q13

Display this question

If Hiring difficulty for AI roles: Does your organization face challenges in recruiting skilled prof... Yes Is Selected

If Yes, which positions are most difficult to hire for, and what skills are most in demand? (Optional)

Q14

How likely is your organization to support or subsidize the following for employees?

	Extremely unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Extremely likely
Short professional certifications or training programs	○	○	○	○	○
Undergraduate certificate in AI or related field	○	○	○	○	○
Graduate certificate or diploma in AI or related field	○	○	○	○	○
Bachelor of Engineering (AI Engineering or similar)	○	○	○	○	○
Bachelor of Science (AI or related field)	○	○	○	○	○
Master of Engineering	○	○	○	○	○
Master of Science	○	○	○	○	○

Q15

How quickly do you expect a new graduate in an AI-related role to become productive in your organization?

- ○ Within 3 months
- ○ 3-6 months
- ○ 6-12 months
- ○ More than 12 months
- ○ Unsure

Q16

Which AI-related job roles in your organization require or would benefit from graduates with a CEAB-accredited engineering program (e.g., BEng)? Please list job titles. (Optional)

Q17

Which AI-related job roles in your organization do not require graduates from a CEAB-accredited program and could be filled by BSc graduates? Please list job titles. (Optional)

Q19

In your view, what should most clearly differentiate a BEng in AI Engineering graduate from a BSc in AI graduate? (e.g., types of roles, responsibilities, depth of engineering design, regulatory responsibilities) (Optional)

Q20

For entry-level graduates of our AI programs, how important are the following competencies in your organization?

	Not important	Slightly important	Moderately important	Very important	Critically important
Technical proficiency (e.g., programming, algorithms, ML, data handling)	○	○	○	○	○
Problem-solving and analytical skills	○	○	○	○	○
Ethical judgment and integrity	○	○	○	○	○
Risk management and awareness of AI-related risks	○	○	○	○	○
Communication skills (written and oral)	○	○	○	○	○
Teamwork and collaboration	○	○	○	○	○
Practical experience with real-world projects	○	○	○	○	○
Commitment to continuous / life-long learning	○	○	○	○	○

Q21

Are there any additional competencies you believe are crucial for graduates of our AI programs? Please list them and briefly explain why. (Optional)

Q22

How important is interdisciplinary knowledge (e.g., legal/regulatory, ethical, managerial, domain-specific) for AI professionals in your organization?

- ○ Very important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not important at all

Q23

If applicable, which interdisciplinary areas do you find most relevant (e.g., healthcare, finance, law, operations, product management) (Optional)

Q24

For entry-level AI roles, which of the following are most important? (Select up to 5.)

- [ ] Strong programming skills (e.g., Python, C/C++)
- [ ] Machine learning and deep learning fundamentals
- [ ] Data engineering and data pipelines
- [ ] Software engineering best practices (version control, testing, CI/CD)
- [ ] MLOps and deployment of models to production
- [ ] Cloud platforms (e.g., AWS, Azure, GCP)
- [ ] AI ethics and responsible AI practices
- [ ] Cybersecurity and secure AI systems
- [ ] Domain knowledge (e.g., finance, healthcare, manufacturing)
- [ ] Communication and stakeholder engagement
- [ ] Project management and teamwork

Q25

Based on your experience, which technical topics or areas should be emphasized in our AI programs to prepare students for the evolving AI workforce? (Optional)

Q26

What types of projects or portfolio evidence (e.g., capstone projects, internships, open-source contributions) most influence your decision to hire entry-level AI graduates? (Optional)

Q27

What types of experiential or work-integrated learning opportunities could your organization provide to students in our BEng/BSc AI programs? (Select all that apply.)

- [ ] Course-based projects / capstone projects (students work on your organization's problem within a course)
- [ ] Onsite internships or co-op placements
- [ ] Virtual internships
- [ ] Short field projects (site visits + focused tasks)
- [ ] Research collaborations
- [ ] Mentorship opportunities
- [ ] Job shadowing experiences
- [ ] Industry-sponsored competitions or hackathons
- [ ] Live case studies or simulations
- [ ] None of the above
- [ ] Other (please specify):

Q28

In addition to experiential learning, what other forms of collaboration would your organization be interested in? (Select all that apply.)

- [ ] Guest lectures and workshops by industry professionals
- [ ] Participation in program advisory committees
- [ ] Providing input into course or program design/content
- [ ] Joint research or innovation projects
- [ ] Facilitating networking events with industry experts
- [ ] Offering mentorship and career guidance to students
- [ ] Providing access to specialized tools, datasets, or software for educational use
- [ ] None of the above
- [ ] Other (please specify):

Q29

Would your organization be interested in reviewing and providing feedback on a draft curriculum or selected course outlines in the future?

- ○ Yes
- ○ No
- ○ Maybe (depending on time and scope)

Q30

What specific AI-related topics, threats, or challenges do you foresee becoming significant in the near future (e.g., AI safety, regulatory changes, workforce impact, AI impact on Society/environment)? (Optional)

Q31

Over the next 5–10 years, how do you anticipate the AI landscape will change, and what impact might this have on the skills and knowledge required of AI professionals? (Optional)

Q32

Please share any additional comments, suggestions, or concerns regarding our proposed AI programs (BEng and BSc), including anything you feel is missing or could be improved. (Optional)

Undergraduate student interest survey questionnaire

BEng / BSc AI Student Survey



The Gina Cody School of Engineering and Computer Science is exploring **two new undergraduate programs in Artificial Intelligence**:

- **Bachelor of Engineering (BEng) in Artificial Intelligence Engineering**
- **Bachelor of Science (BSc) in Artificial Intelligence**

We are asking current Concordia students for feedback on how interesting these programs would be and what features matter most to them.

The survey takes about **5-10 minutes** to complete and will close on **March 27, 2026**. Your responses are confidential and will only be used in aggregate to help shape future programs.

Thank you for your time and feedback.

Warm regards,

Dr. Ait Mohamed
Associate Dean, Academic Programs
Gina Cody School of Engineering and Computer Science
Concordia University

Q2

What program are you currently enrolled in?

- ○ BCompSc – Computer Science
- ○ BEng – Aerospace Engineering
- ○ BEng – Building Engineering
- ○ BEng – Chemical Engineering
- ○ BEng – Civil Engineering
- ○ BEng – Computer Engineering
- ○ BEng – Electrical Engineering
- ○ BEng – Industrial Engineering
- ○ BEng – Mechanical Engineering
- ○ BEng – Software Engineering
- ○ Other (please specify):

Q3

What is your current year of study?

- ○ 1st year
- ○ 2nd year
- ○ 3rd year
- ○ 4th year or above
- ○ Other (please specify):

Q4

How interested are you in AI-related topics (e.g., machine learning, data, robotics, AI software)?

- ○ Very interested
- ○ Somewhat interested
- ○ Neutral
- ○ Not very interested
- ○ Not at all interested

Q5

We are considering **two new AI programs** at Concordia:

1. Bachelor of Engineering (BEng) in Artificial Intelligence Engineering

- A **four-year engineering degree**
- Focused on **building real AI systems**, combining:
  - AI software and algorithms
  - Data and cloud infrastructure for AI
  - Hardware, embedded systems, and robotics using AI
- Includes strong **math and engineering foundations**, engineering science, and team design projects
- Leads toward **engineering-type roles** that design, build, and deploy AI systems in the real world (e.g., AI engineer, ML engineer, AI systems engineer, AI developer in robotics or autonomous systems).

2. Bachelor of Science (BSc) in Artificial Intelligence

- A **three-year science degree (90 credits)**
- Focused on **algorithms, data, and software for AI**
- Fewer engineering core courses (less emphasis on hardware, engineering design projects, and some engineering math)
- More room for **AI, computer science, and general electives**
- Leads toward more **software and data-focused roles** (e.g., ML developer, data scientist, AI software developer, AI analyst).

Both programs:

- Share a strong **AI core** (machine learning, deep learning, data analytics, AI systems)
- Include content on **ethics, safety, security, fairness, and explainability** in AI
- Offer **hands-on projects** and opportunities to work with real data and tools.

Q6 ✶

Based on this description, how likely is it that you would apply to the **BEng** in Artificial Intelligence Engineering if it became available today (assuming you were at the stage of choosing a program)?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q7 ✶

If the **BEng** in Artificial Intelligence Engineering had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q8

How likely is it that you would apply to the **BSc** in Artificial Intelligence if it became available today (assuming you were at the stage of choosing a program)?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q9

If the **BSc** in Artificial Intelligence had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q10

How relevant do these proposed AI programs feel to your academic and career goals?

- ○ Very relevant
- ○ Somewhat relevant
- ○ Not very relevant
- ○ Not relevant at all
- ○ Don't know

Q11

Display this question

If How relevant do these proposed AI programs feel to your academic and career goals? Not relevant at all Is Selected

Or How relevant do these proposed AI programs feel to your academic and career goals? Don't know Is Selected

If you responded, "Not very relevant", "Not relevant at all" or "Don't know", please briefly explain why.

Q12

Which of the following **course areas** are most interesting to you? (Select up to 5.)

- ☐ Machine learning and deep learning
- ☐ Generative AI and large language models
- ☐ Reinforcement learning and agents
- ☐ Data analytics and data engineering
- ☐ AI + robotics / autonomous systems
- ☐ Edge AI and embedded/real-time AI systems
- ☐ Cloud AI and distributed ML
- ☐ Trustworthy, safe, and fair AI
- ☐ AI security and AI for cybersecurity
- ☐ Advanced AI theory and algorithms
- ☐ AI for specific domains (e.g., healthcare, energy, telecom)
- ☐ None of the above

Q13

How important are the following features in an AI-related program for you?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Co-op or paid internships in AI-related roles	○	○	○	○	○
Hands-on labs and projects using real datasets and tools	○	○	○	○	○
Industry-sponsored capstone projects	○	○	○	○	○
Opportunities for undergraduate research in AI	○	○	○	○	○
Courses on ethics, law, and societal impacts of AI	○	○	○	○	○
Access to GPUs / cloud resources for AI projects	○	○	○	○	○

Q14

In what ways could an AI program be made more attractive to students like you? (Select all that apply.)

- ☐ Co-op option available
- ☐ Mandatory co-op included in the program
- ☐ More hands-on training and projects
- ☐ Clear specializations (e.g., AI + Robotics, AI + Cybersecurity, AI + Healthcare)
- ☐ Flexible electives that can be tailored to interests
- ☐ Opportunities to work directly with companies on AI projects
- ☐ Other (please specify):

Q14

In addition to the BEng and BSc in AI, we will be offering a **Minor in Artificial Intelligence** that could be added to many existing degrees.

Q15

If a 25-credit Minor in Artificial Intelligence were available and compatible with your program, how likely is it that you would consider completing it?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q18

Looking at your own situation, which of the following would be most appealing to you? (Select one.)

- ○ A full BEng in Artificial Intelligence Engineering
- ○ A full BSc in Artificial Intelligence
- ○ A Minor in AI added to my current program
- ○ More AI-focused electives within my current program (no new credential)
- ○ None of the above

Q19

What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?

Q20

What is the main reason you would **not** consider an AI-focused program?

Q21

Any final comments or suggestions about the proposed AI Engineering or AI programs?

Q2 - Name

20 Responses

Name
Jean-Samuel Chenard
Jean-Samuel Chenard
Mike Lee
Fiona Simpson
Naysan Saran
Camille Matte
LUCA CROTTI
Patrick Jean-Baptiste
jean-francois cantin
Marco de Tavira
Jacques Gauthier
Oz Gurtuna
Fiona Simpson
Salma Iamrini
Daniel Ratchford
Tamara Vandersluis
Parul Khanna
Anders Jeppsson
Mehdi Abedinpour Fallah
ZHENGLIN XIONG

Q3 - Current job title

Current job title

President
President
CEO
Chief Executive Officer
Co-founder and CEO
Associate Manager, System Design
Consultant
Security Director
transport engineer
Director of Operations, PSS
VP Business Development
Founder / CEO
Chief Executive Officer
Responsable marketing
VP & Head of Delivery
VP Innovation
Vice President - Cybersecurity
Vice President Engineering
R&D Principal specialist, Controls Software Engineering
CEO

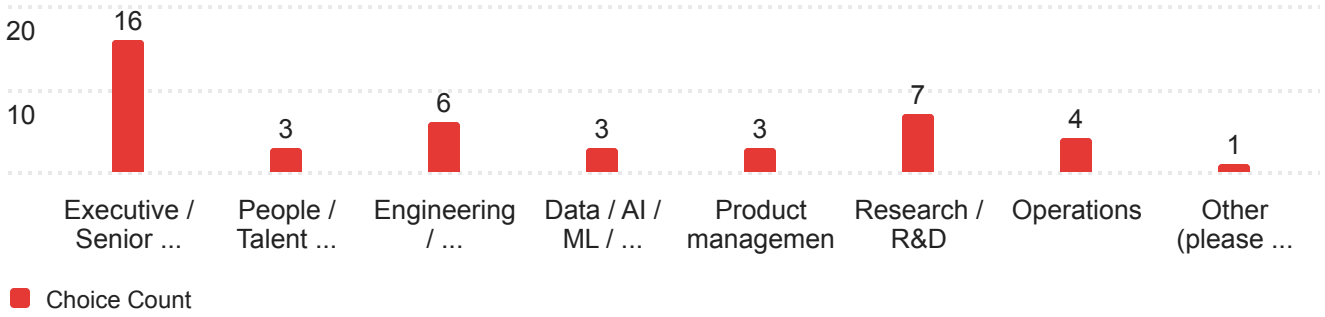
Q4 - Organization

Organization
Motsai
Motsai

Fundica
BioMimir Inc.
CANN Forecast
Zimmer Biomet
Alfiere Innovation
Sunphinx inc.
Gbi
Laurentide Controls
Upbrella International
Plumfind
BioMimir Inc.
Makila
Applexus Technologies
R2i
BNP Paribas
Syntronic R&D Inc
Pratt & Whitney Canada
AEROPORT AI

Q5 - Which of the following best describe(s) your core responsibilities? (Select all that apply.) - Selected Choice

20 Responses



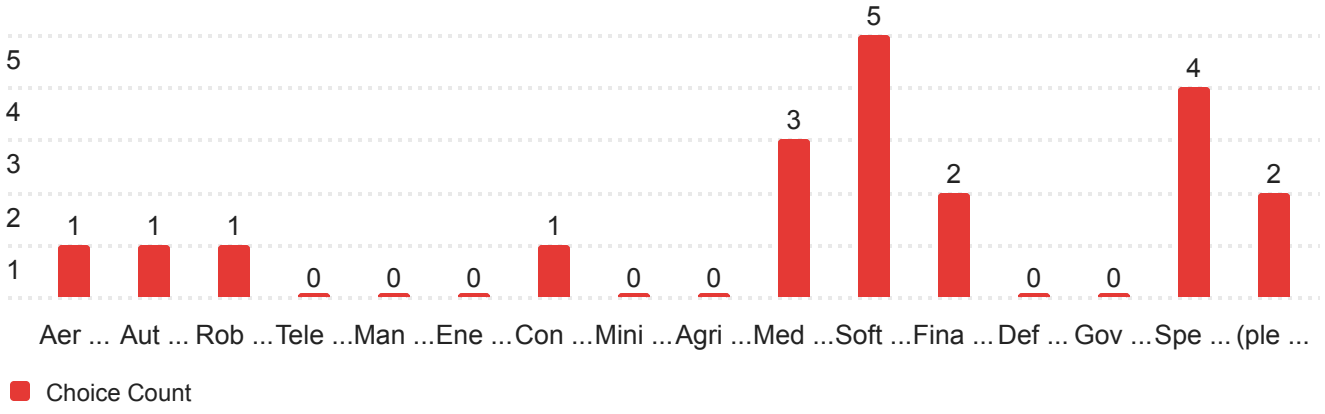
Q5_8_TEXT - Other (please specify): - Text

Other (please specify): - Text

+consultant

Q6 - Sector: Which sector best describes your organization? (Select one.) - Selected Choice

20 Responses



Q6_16_TEXT - Other (please specify): - Text

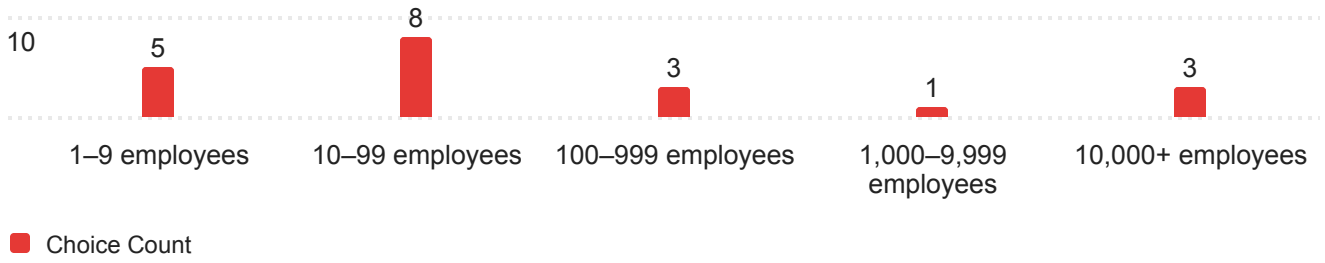
Other (please specify): - Text

Information technology - servers

R&D Design services

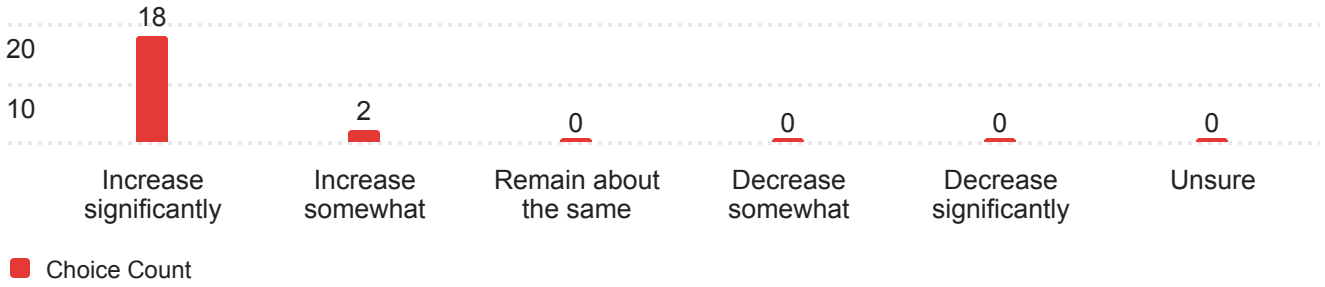
Q7 - What is the size of your organization (globally)?

20 Responses



Q9 - Future demand: How do you expect demand for AI-related roles in your industry to change over the next 5 years?

20 Responses



Q10 - Existing AI job titles: What job titles in your organization currently require AI-related knowledge and skills? (e.g., ML Engineer, AI deployment, Data Scientist, AI Product Manager) (Optional)

16 Responses

Existing AI job titles: What job titles in your organization currently require AI-related knowledge and skills? (e.g., ML Engineer, AI deployment, Data Scientist, AI Product Manager) (Optional)
We don't yet call the roles AI-something, but we need AI Electronics engineers and AI Firmware developpers
Firmware designer, hardware designer
ML Engineer

Data Scientist
AI Product Manager
MLOps engineer

System designer/engineer, Software designer/engineer

Embedded hardware and software development Eng.; data analysis, testing Engineer, feasibility engineer

Data Scientist

None exists at this time - We need to create the role

AI/ML Specialist (we don't use the term "engineer" due to QC regulations)

ML Engineer

Data Architect, Data scientist, ML engineer

Product Development

Solution architect, sales team

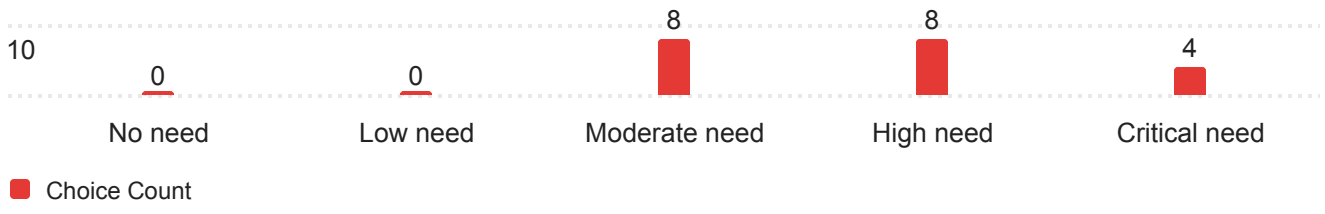
Data Scientist, ML Engineer, Automation Engineer, AI Engineer, Applied Machine Learning Scientist, AI Research Scientist, Data and ML Engineer, Credit Risk Modeling Scientist, Financial Data Scientist,AI Transformation Lead, AI Program Manager, Head of AI Strategy, AI Risk Modeling Lead, Chief AI Officer

ML, AI neural network algorithms

Industrial AI Engineer, ML Engineer

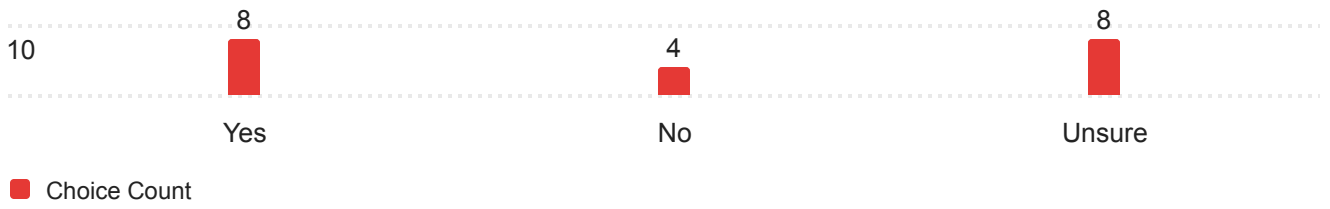
Q11 - Need for training / upskilling: How would you assess the need for training and skill updating in AI-related roles within your organization?

20 Responses



Q12 - Hiring difficulty for AI roles: Does your organization face challenges in recruiting skilled professionals for AI-related roles?

20 Responses



Q13 - If Yes, which positions are most difficult to hire for, and what skills are most in demand? (Optional)

5 Responses

If Yes, which positions are most difficult to hire for, and what skills are most in demand? (Optional)

Knowledge of hardware systems with AI accelerators. Basically Electrical engineers with knowledge of hardware that is accelerated with AI (NPUs, embedded devices).

There is a bit of a disconnect between the realitity of the market and electrical engineering, so we usually aim to hire more senior and train in house.

We hire AI professionals at the intersection of ML and biochemistry and it is very difficult to find professionals with dual skills sets. We also have difficulty hiring professionals who have the skills to build training data sets and train new ML models. Existing programs focus more on operationalizing existing ML models than building new models.

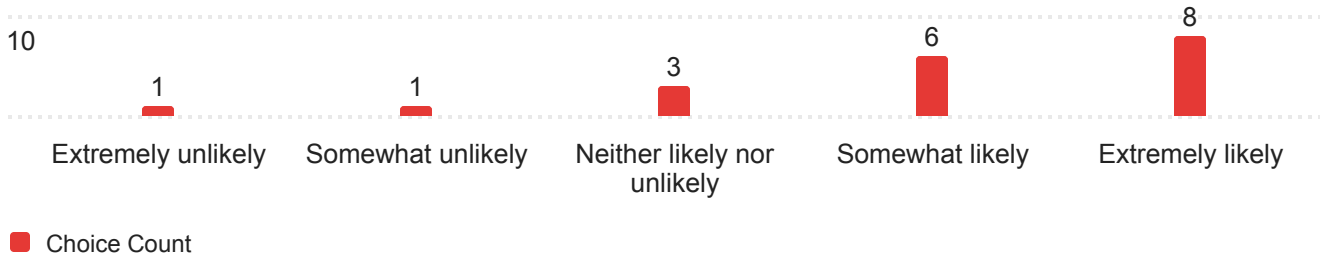
We provide applied AI services, so deployment, quality control and cloud computing are also essential skills.

We need AI specialists at the intersection of biochemistry and physiology and ML. It's been extremely hard to find individuals with dual skillsets.
We have also found very few individuals with sufficient theoretical and mathematical training to develop new AI/ML models. Current graduates may have run models and read about artificial neural networks, but they haven't been forced to do sufficient problem solving on the theoretical level, so they are incapable of determining appropriate training data, designing layer structure, and building new ML models.
We have also found the coding skills of current graduates to be severely lacking. AI/ML professionals need to be fluent in at least one coding language (Java, Python, C#) and the current curriculum (and Git and vibe coding) isn't turning out professionals who are fluent enough to solve the type of advanced problems with code that are required to build ML models in a time and cost-effective manner.

Agentic development. People with skills in python, orchestration and modeling.

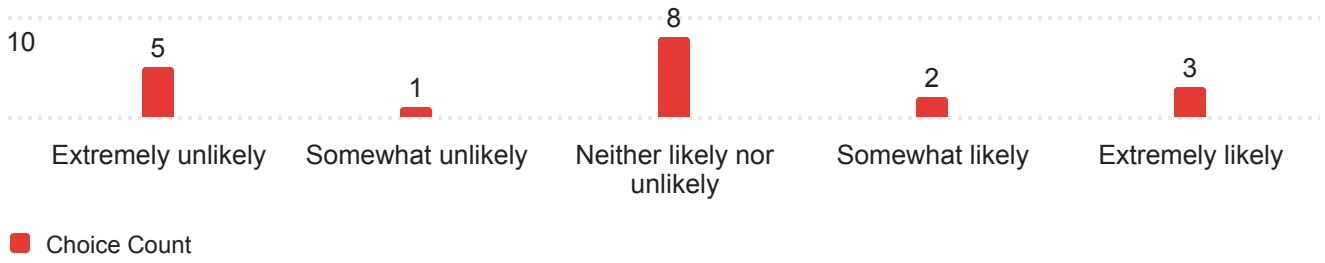
Q14_1 - Short professional certifications or training programs

19 Responses



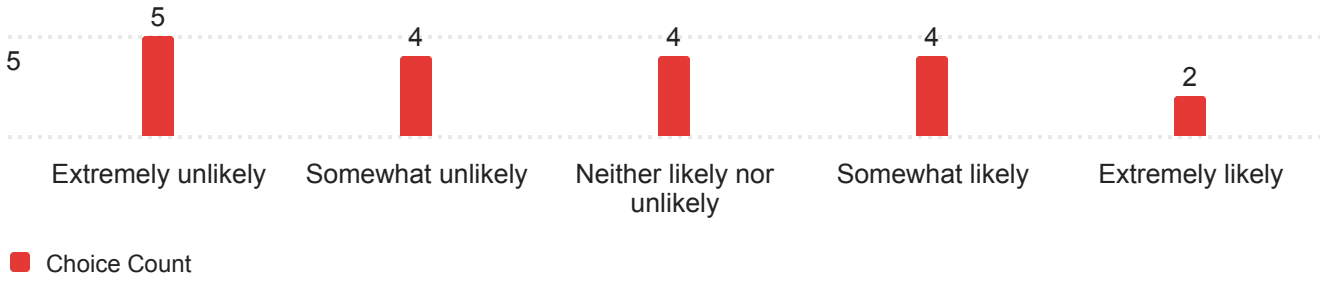
Q14_2 - Undergraduate certificate in AI or related field

19 Responses



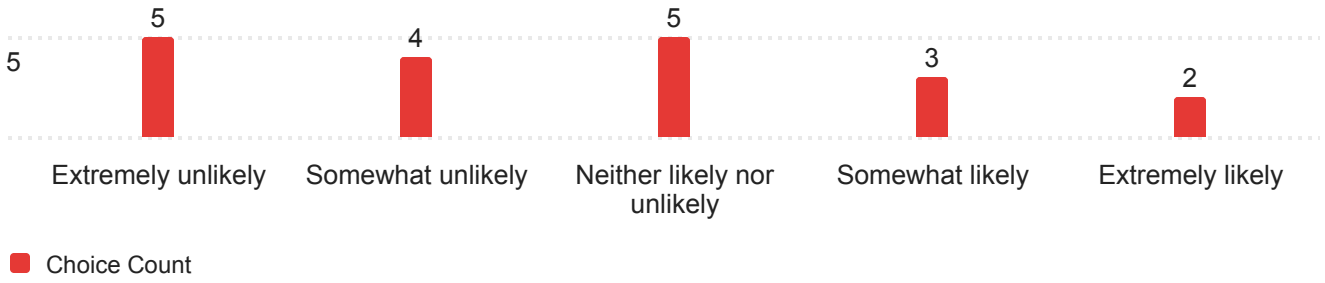
Q14_3 - Graduate certificate or diploma in AI or related field

19 Responses



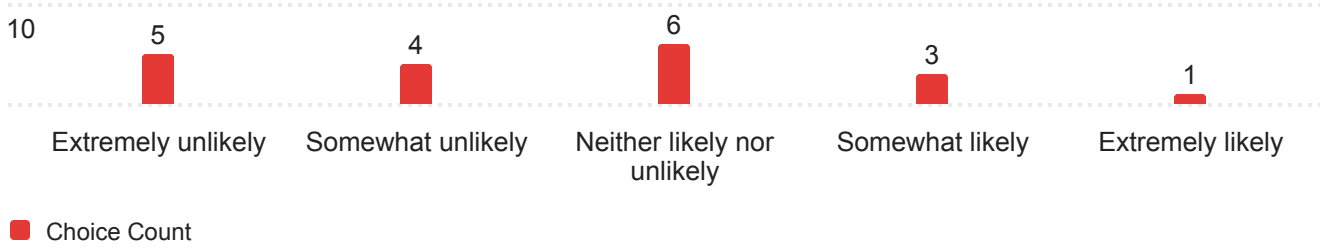
Q14_4 - Bachelor of Engineering (AI Engineering or similar)

19 Responses



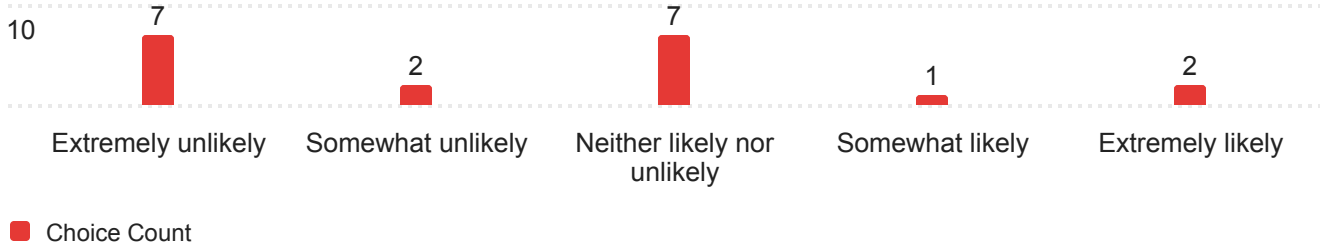
Q14_5 - Bachelor of Science (AI or related field)

19 Responses



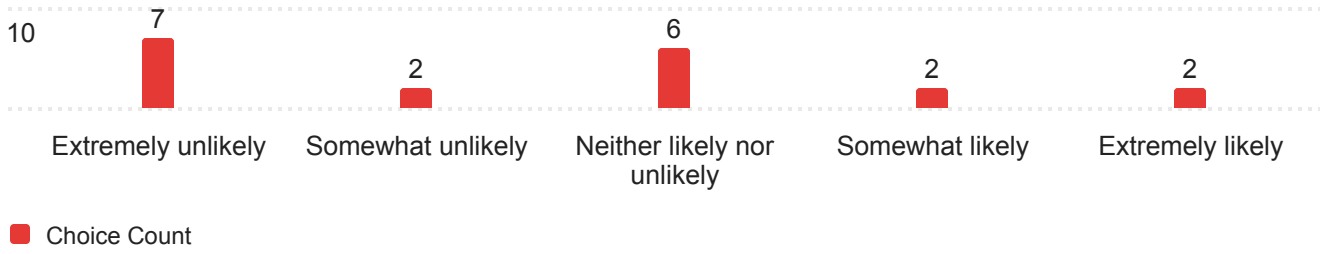
Q14_6 - Master of Engineering

19 Responses



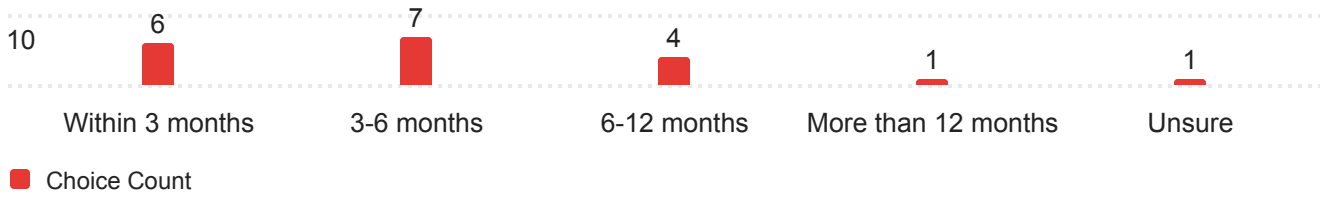
Q14_7 - Master of Science

19 Responses



Q15 - How quickly do you expect a new graduate in an AI-related role to become productive in your organization?

19 Responses



Q16 - Which AI-related job roles in your organization require or would benefit from graudates with a CEAB-accredited engineering program (e.g., BEng)? Please list job titles. (Optional)

10 Responses

Which AI-related job roles in your organization require or would benefit from graduates with a CEAB-accredited engineering program (e.g., BEng)? Please list job titles. (Optional)

Hardware design for NPU accelerated products
Firmware engineering with neural nets or classifiers.

We hire electrical engineers and they need to understand NPUs and hardware accelerators.

Its not mandatory that they are engineers, but the program and training helps.

Software de

System designer/engineer, Software designer/engineer

Embedded software developer and testing engineer

We mostly work with SMEs, so instead of accreditation, most clients are interested in case studies and use cases.

None

For R2i its more about SW and HW requirements to run these workloads as well as the DEVOPS pipeline. For my customers its Data Pipeline and also devops. As well as what is possible. Also translators between IT and Mgt and what is possible.

All techincal roles related to AI

Industrial AI Engineer, ML engineer

Q17 - Which AI-related job roles in your organization do not require graduates from a CEAB-accredited program and could be filled by BSc graduates? Please list job titles. (Optional)

7 Responses

Which AI-related job roles in your organization do not require graduates from a CEAB-accredited program and could be filled by BSc graduates? Please list job titles. (Optional)

Typically the more high level software roles.

For firmware designers/engineers, they need to be aware of the methods to structure and train neural networks.

Those roles may not need to be engineers.

Sales, Customer Service, Accounting

My organization (in Montreal),requires to hold an engineering degree, BSc graduate is not a suffiscient qualification

Please see above

all our jobs today, simply becuase there are no graduates or entry level jobs.

Data scientist

Q19 - In your view, what should most clearly differentiate a BEng in AI Engineering graduate from a BSc in AI graduate? (e.g., types of roles, responsibilities, depth of engineering design, regulatory responsibilities) (Optional)

11 Responses

In your view, what should most clearly differentiate a BEng in AI Engineering graduate from a BSc in AI graduate? (e.g., types of roles, responsibilities, depth of engineering design, regulatory responsibilities) (Optional)

The electronic design roles tend to prefer engineering graduates than BSc because we have analog and circuitry that deal with higher voltages and more norms.

A few projects will need Enginering knowledge. Generally the school curriculum does not go deep enough and many are learning on the job. Engineering graduates tend to be stronger on the electronic hardware side.

BEng has a focus on problem solving, BSc has a focus on analytics

Algorithm creation, communication architecture definition

For some companies, having engineers in the team who are members of the L'Ordre des ingénieurs du Québec may be desirable. For us, what's more relevant is a good understanding of engineering practices, project management skills and complex system design.

I expect a BSc to focus on the theoretical and mathematical aspects of AI/ML. Given the degree description, I would hope that the space for additional coursework would allow for other electives in areas like biochemistry, neuroscience, language/linguistics, geography, or other courses that will help to inform the development of AI/ML models and give better context to the content and ethics of future AI and ML development. I would hire individuals with this type of degree to focus on model development including architecture and data analysis. I expect this type of role to be focused on achieving specific research or development goals, in consultation with an engineering team for general feasibility.
I expect a BEng to focus on software/hardware implementation of AI models. I would still expect these students to have strong fundamentals, but I would hire a BEng to implement AI-models so that they are functional systems, whether they are cloud-based software or hardware with AI-control systems like robotics. I expect this role to work hand-in-hand with other types of engineers in teams to achieve regulatory compliance.

I believe all dev roles would be BSc, any back end, robotics or enablement roles relying on hardware would be BEng.

I see engineering as understanding the underlying architecture and required components. I see the BSc as understanding the science behind the models.

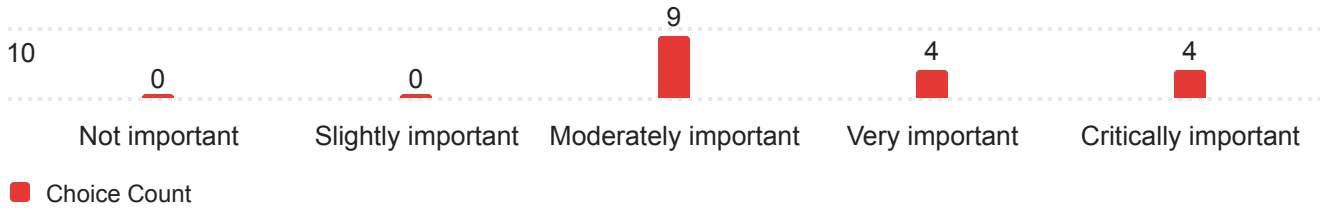
BSc should focus on the theoretical and scientfic foundations of Ai and data science, while Beng should focus more on engineering, system design and practical deployment

deep understanding of efficiently designing and implementing bespoke "AI"/neural network... solutions

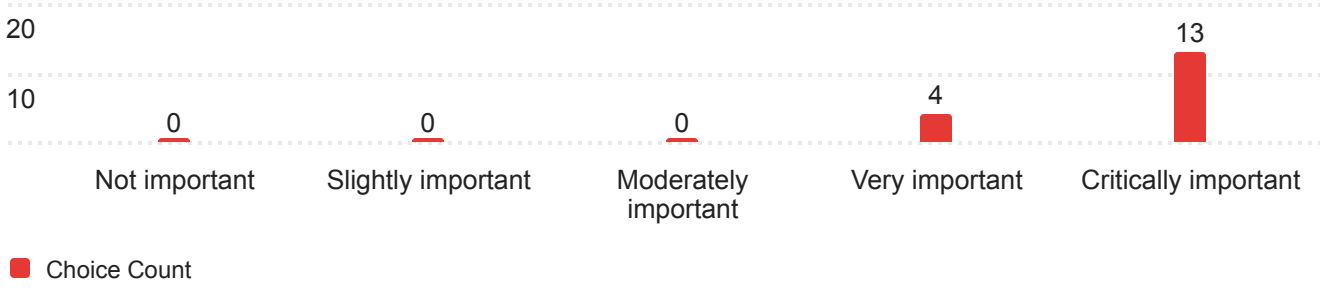
depth of engineering design and CO-OP

Q20_1 - Technical proficiency (e.g., programming, algorithms, ML, data handling)

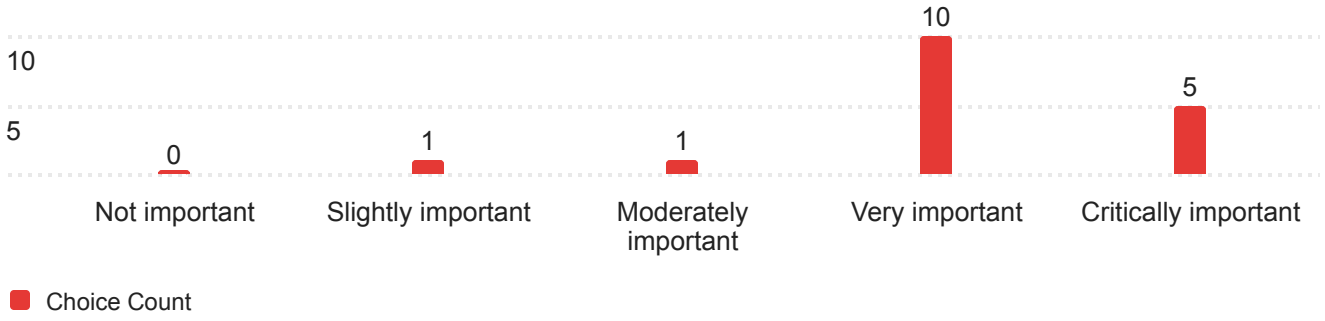
17 Responses



Q20_2 - Problem-solving and analytical skills



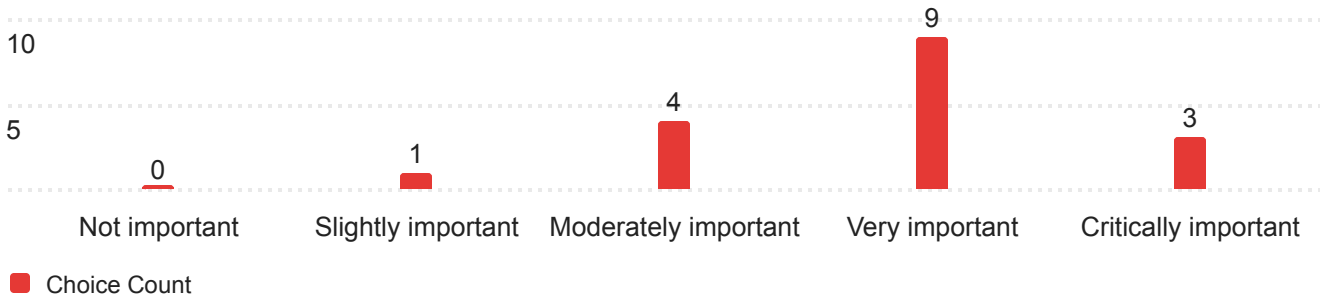
Q20_3 - Ethical judgment and integrity



Q20_4 - Risk management and awareness of AI-related risks

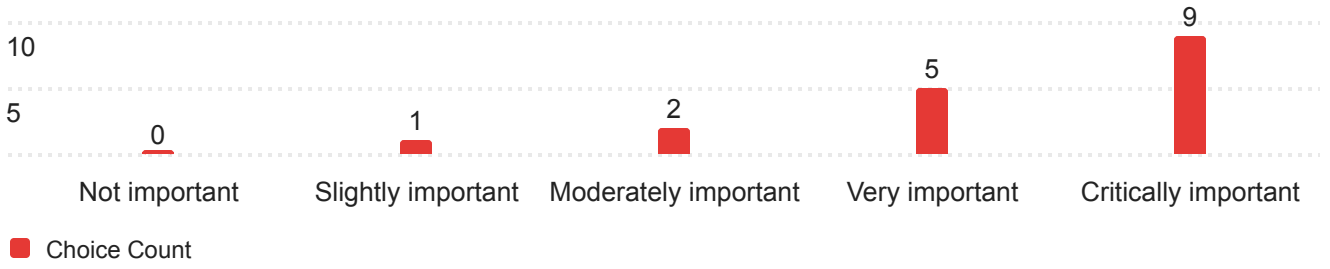


Q20_5 - Communication skills (written and oral)

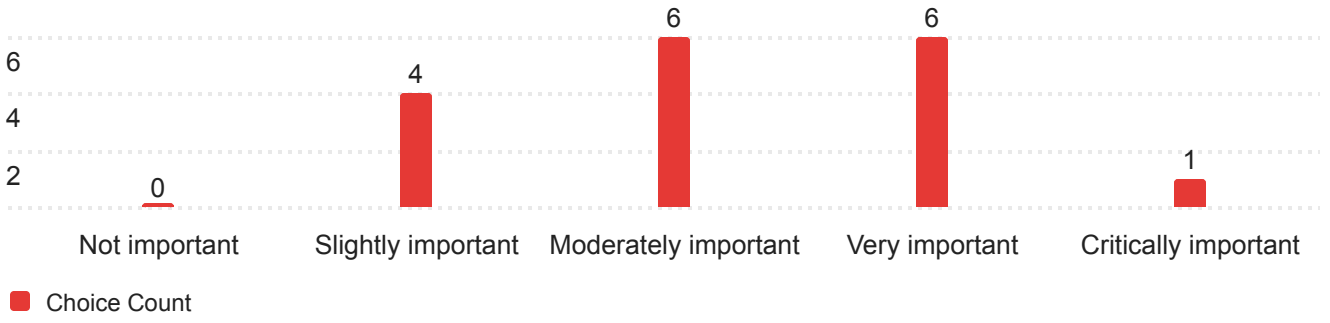


Q20_6 - Teamwork and collaboration

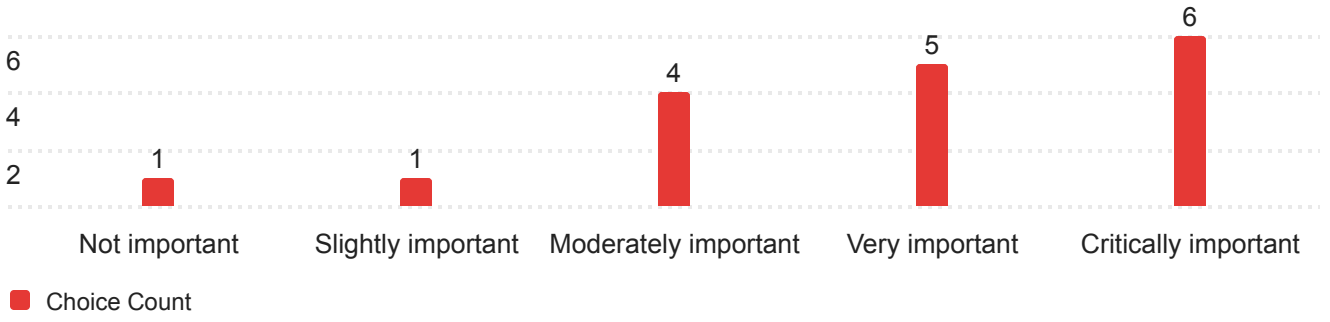
17 Responses



Q20_7 - Practical experience with real-world projects



Q20_8 - Commitment to continuous / life-long learning



Q21 - Are there any additional competencies you believe are crucial for graduates of our AI programs? Please list them and briefly explain why. (Optional)

10 Responses

Are there any additional competencies you believe are crucial for graduates of our AI programs? Please list them and briefly explain why. (Optional)
Knowledge of where the data will flow (local models, remote models, LLMS). Cybersecurity and data confidentiality exposure. This to avoid leaking information to models that are not trusted.
Knowledge on how to embed AI algorithms on the edge and practical knowledge of deployments of AI systems.
Using LLMs and Agents to increase productivity
hardware knowledge
Cloud computing: most AI talent don't understand that what they are building has to deployed to create real value. Either for batch processing or as an AI end-point. A good understand of data sovereignty is also important. Should/could we deploy on US hyperscalers?

Math - vector calculus, matrices; Artificial neural networks (should be included in technical proficiency but bears repeating)

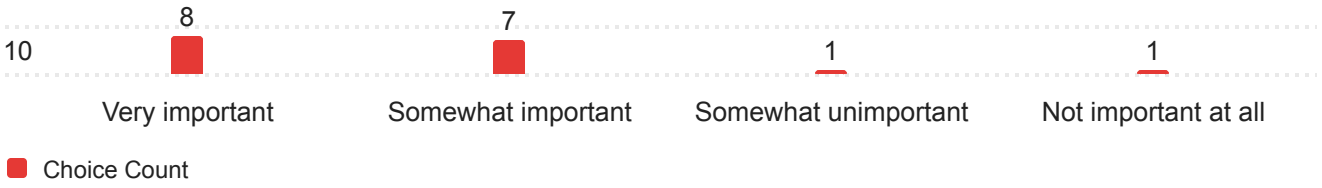
Passion, we look for people that have a passion for the job.

As we sell infrastructure and have no need for data scientists its hard to answer these questions. I answered them as what I believe is true from my customers.

you have covered them all in above.

deep understanding of relevant mathematics, logic and algorithm design. Today's graduates are severely lacking in basic logical edge case design

Q22 - How important is interdisciplinary knowledge (e.g., legal/regulatory, ethical, managerial, domain-specific) for AI professionals in your organization?



Q23 - If applicable, which interdisciplinary areas do you find most relevant (e.g., healthcare, finance, law, operations, product management) (Optional)

13 Responses

If applicable, which interdisciplinary areas do you find most relevant (e.g., healthcare, finance, law, operations, product management) (Optional)

Product and project management skills are quite valuable.

Product management, operations and life cycle management.

infrastructure management

Mechanical engneering & robotics engineering, healthcare

quality management in advanced manufacturing

market intelligence

A basic understanding of PII and data privacy is always a plus. Project management is hugely helpful: a basic understanding of work packages, level of effort estimates, critical path, GANTT charts, etc.

Healthcare, medicine

Operations, project management, industry exposure.

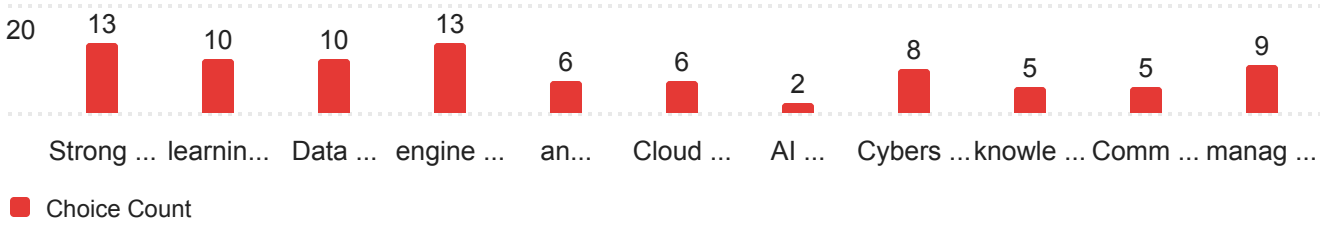
For success in delivering AI solution's it is imperative to have an understanding of how to decide on what projects to accept, to articulate the value of a given project in concrete numbers (improve the model by x% = a savings of xx$), this way the project can be measured against the expected benefits in order to state it was successful or not.

telecom, defence, industrial

Standards/regulatory

product management, operations

Q24 - For entry-level AI roles, which of the following are most important? (Select up to 5.)



Q25 - Based on your experience, which technical topics or areas should be emphasized in our AI programs to prepare students for the evolving AI workforce? (Optional)

12 Responses

Based on your experience, which technical topics or areas should be emphasized in our AI programs to prepare students for the evolving AI workforce? (Optional)

Good understanding of AI workflows from model to silicon (for computer engineering).

Limits of AI systems and how to measure their performance metrics.

One of the strongest element to be aware of is the trend for the code output to be commoditized. Students need strong coding fluency (to review code output), but even more important they will need to write comprehensive specs.

Neural network accelerators. Transforming neural nets to edge systems. Telecommunication and effects on AI solutions. Model quantization and pruning.

AI Best Practices, real world case studies

embedded AI / EdgeAI

Cloud computing basics: elastic compute, types of storage, instances using GPUs, tools such as Google Vertex AI, AWS Bedrock, etc.

Trends in AL/ML are ephemeral but mathematics, artificial neural networks, and solid coding skills will always be employable. A solid foundation with excellent problem solving skills is far more valuable than someone who is up to date on the latest Llama or ChatGPT deployment and relies on vibe coding and Git lookup to do their homework.
Teach students to read research papers. Cutting edge AI/ML research is released weekly and competitive employees will need to read the latest developments from academic sources if they want to drive the cutting edge. If you find out the latest in AI from a newspaper, you are already more than 18 months behind the product development of leading companies. Learning how to teach yourself new skills and committing yourself to keeping up to date in a rapidly evolving field is crucial for success. You aren’t done learning when you get your degree.

Understand that AI is not a standalone study and is just a subset of a projects overall deliverable.

Be able to articulate a measurable success criteria and measure the outcome and value of a project when delivered. When a project fails to document why it failed and what will be done to ensure the mistakes that were made will not be made again (ability to do a post mortem with action items). Success comes through failure - learn from failure. The more you fail the more you likely you are to succeed.

It should begin with solid foundations in probability, statistics, and optimization, then move on to core machine-learning and deep-learning concepts (supervised and unsupervised methods, CNNs, RNNs/Transformers). Practical skills are equally essential: building data-engineering pipelines, mastering MLOps (version control, containerization, CI/CD, model monitoring), leveraging cloud AI services, and practicing responsible-AI techniques such as explainability, fairness, and privacy. As a Concordia student aiming for a finance career, I also recommend adding industry-specific topics—time-series forecasting, anomaly/fraud detection, and risk modeling—so graduates can immediately apply AI to real business challenges.

fundamental engineering skills/understanding and especially mathematics and logical (as in if a then b) thinking and algorithm design. Things evolve hast so fundaments need to be strong. And only accept students that have a passion. Students who are only moderately interested/talented won't make it/get jobs.

python programming

agent, embodied ai.

Q26 - What types of projects or portfolio evidence (e.g., capstone projects, internships, open-source contributions) most influence your decision to hire entry-level AI graduates? (Optional)

11 Responses

What types of projects or portfolio evidence (e.g., capstone projects, internships, open-source contributions) most influence your decision to hire entry-level AI graduates? (Optional)

Generally capstone projects and open source contributions are highly valudable.

We prefer capstone projects and some industry experience.

internships

internships

Working with data collected specifically for a project (as opposed to using an existing dataset). The work involved in data collection is generally vastly underestimated. Model evaluation and an objective assessment of model performance and biases.

In an interview, we're going to sit you down and quiz you on your math skills, the theoretical basis of AI models, your code base in Java, Python, and your knowledge of the subject matter of the models that we are building. If you have a portfolio or internship, we will use that as a starting point for the discussion, so this type of program-mandated experience can be useful if it helps to hone your technical skillset and give you fodder to answer questions. The existence of mandatory projects and portfolio work isn’t useful in and of itself. I cannot tell you how many prospective post-doctoral candidates I have interviewed who are “First Author” on scientific papers who don’t know the first thing about them when questioned. As a team, we are far too skeptical to hire you based on anything less than an absolute technical grilling. Otherwise, we prioritize employment experience (even in unrelated fields, retail if fine!) or self-initiated projects over anything that is program-mandated.

Our drive to develop our own IP. We are a consulting firm, but we differentiate ourselves through IP. The development of that is the type of project we could use help with.

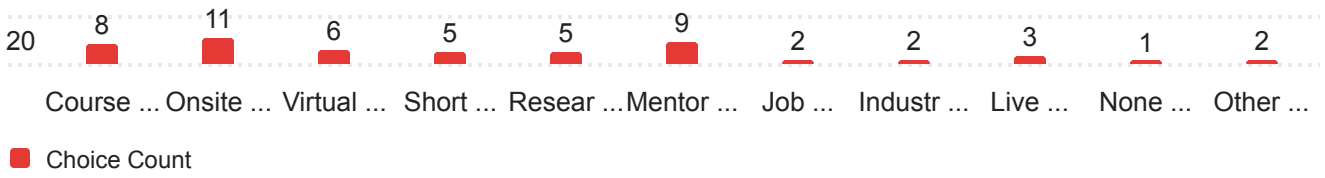
This does not apply to R2i - but for my customer's I believe it would be a student that worked at one of the superclusters (ScaleAI, NGEN...) on perhaps reviewing project intakes as well as reviewing the outcomes of project phases against what was expected. Experience DEVOPS, data cleansing and wrangling.

When evaluating entry-level AI candidates, I look for any concrete projects that clearly demonstrates problem-solving ability. It can be from anywhere (internship, classroom projects or personal)

Passion, intelligence, personality, strong logical thinking, being able to communicate their understanding

projects, open-source contributions

Q27 - What types of experiential or work-integrated learning opportunities could your organization provide to students in our BEng/BSc AI programs? (Select all that apply.) - Selected Choice



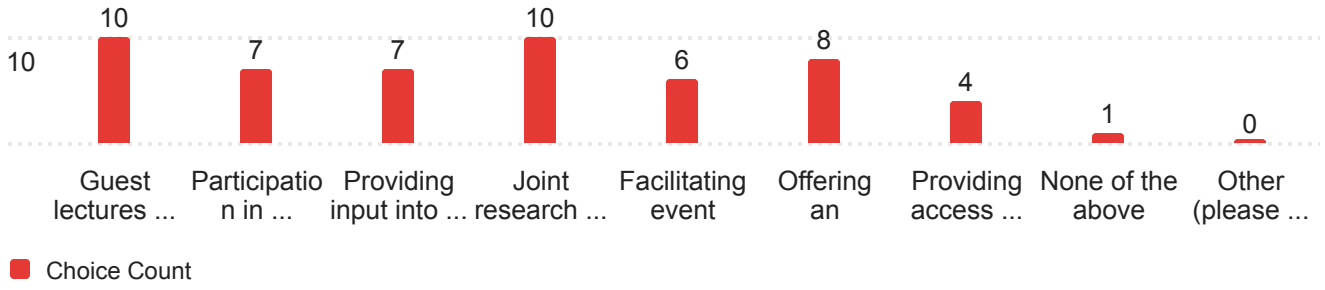
Q27_11_TEXT - Other (please specify): - Text

2 Responses

Other (please specify): - Text
Workshops on AI on the cloud
We sell HW and our cloud, so very little in direct AI

Q28 - In addition to experiential learning, what other forms of collaboration would your organization be interested in? (Select all that apply.) - Selected Choice

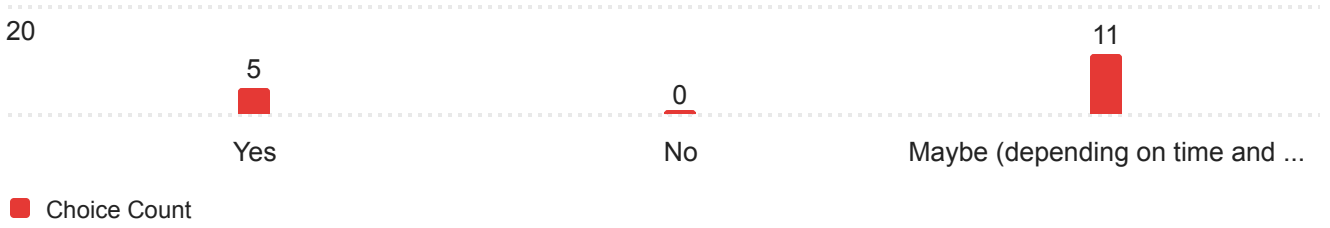
16 Responses



Q28_9_TEXT - Other (please specify): - Text

No data found - your filters may be too exclusive!

Q29 - Would your organization be interested in reviewing and providing feedback on a draft curriculum or selected course outlines in the future?



Q30 - What specific AI-related topics, threats, or challenges do you foresee becoming significant in the near future (e.g., AI safety, regulatory changes, workforce impact, AI impact on Society/environment)? (Optional)

11 Responses

What specific AI-related topics, threats, or challenges do you foresee becoming significant in the near future (e.g., AI safety, regulatory changes, workforce impact, AI impact on Society/environment)? (Optional)

Landscape is moving very fast and some self-learners gain a very strong advantage. It seems to me that code is becoming a commodity while specification and formal structuring of projects will be the valuable asset.

workforce only skills set

AI resouce availability (grid and network) and regulations (laws)

AI safety

Responsible use of AI, quality control of AI models, cost-efficient and environmentally friendly deployment of AI models (e.g., Edge AI), open weight/open source models to increase sovereignty.

Code longevity – QC to prevent code degradation in large systems over time, implementations over implementations covering bad code that can no longer be fixed
Environmental impact of data centers
AI/ML Ethics:
Racial, gender, sexuality, class systems bias
Privacy including surveillance, anonymity, data brokerage, Hawthorne effect
Medical ethics – predictive care models (insurance denial, denial of care), eugenics

Workforce impact. Differentiating ourselves from everyone else that says they are AI enabled.

Data sovereignty, compliance, security in an opensource world.

AI off the cloud. Secure use of AI to protect IP/state secrets, ... Workforce impact, especially for junior/intermediate developers who don't completely understand AI generated code/designs so can't do code/design reviews. And how will the get better when leaning on AI to produce instead of challenging their brains...

Standards and regulatory changes

AI safety

Q31 - Over the next 5–10 years, how do you anticipate the AI landscape will change, and what impact might this have on the skills and knowledge required of AI professionals? (Optional)

9 Responses

Over the next 5–10 years, how do you anticipate the AI landscape will change, and what impact might this have on the skills and knowledge required of AI professionals? (Optional)

Coding will become a commodity produced by LLM. Structuring requirements and good unit tests along with very tight specifications will be needed to guide LLMs to accomplish the code output.

Due to world models and image processing massive improvements, robots and edge devices will have a lot of growth. Agentic coding and tools will gain a strong foothold and it will be quite disruptive. However, sound judgement, critical thinking skills, teamwork and communication skills will remain the most sought after skills. It will be critical that students master the fundamentals quite well to understand the limitations of LLMs.

not easy! I would bet AI being used as a building block for more complex systems, and a common communication /data sharing framework will be created to allow this (conceptual example: every device have a connector for "AI data exchange")

It will strongly alter current practices/paradigms related to information management (technical and business) and use

It's really hard to predict that timeframe, but I think that the demand for this talent will only increase (e.g., Palantir's "Forward Deployed Engineer" role will be in demand by many more companies). I also think that fundamental skills in applied stats, probability and math will remain critically important. We don't understand what's exactly going on in many AI models, but understanding the difference between randomness and deterministic output is very important. How can we ensure a certain quality target if the outputs are random? Even more importantly, how can we explain this to our clients? My expectation of an "AI expert" is to be able to clearly articulate the trade-offs and the expected links between cost, performance, latency, usability and other design considerations.

The public’s attention has most recently been drawn to generative AI, but it’s hardly the most transformative or dangerous implementation of AI/ML possible. Increasingly autonomous logistics and robotics systems in the transportation, manufacturing, and energy sectors, increased data collection and aggregation in medicine and our personal lives, and our increasing reliance on cloud services and connection means that more and more of the infrastructure that underpins our daily existence is being automated and handed off to AI/ML systems. Professionals in this field need training in ethics, not just for use case but also for the consequences of degraded and damaged software. Over the next 5-10 years, I anticipate that professionals will do as much damage control for the poorly built ML systems of today’s vibe coding epidemic, as creation of new systems. We need to train highly skilled problem solvers, not code monkeys who write bits and pieces of code without considering the consequences of poor quality or lack of integration down the line, when the agglomeration of code layers becomes an irreversible problem.

I think it will become like all landscapes before it...just part of the overall landscape and not the dominant force that it is today.

We are seeing pressure and the ability to source; components, floor space, electricity to the hungry nature of AI. We will need to see improvements in supply chain and improvement in efficiencies in order to feed he AI beast.

Only the strongest, smartest SW developers will have jobs. They architect and prompt and evaluate the output from complex AI event systems. This is a 2-3 year horizon. Not 5-10

Manage AI agents

Q32 - Please share any additional comments, suggestions, or concerns regarding our proposed AI programs (BEng and BSc), including anything you feel is missing or could be improved. (Optional)

5 Responses

Please share any additional comments, suggestions, or concerns regarding our proposed AI programs (BEng and BSc), including anything you feel is missing or could be improved. (Optional)

Its a good thing that the programs be revisited in depth because they could risk becoming quite quickly out of alignment with the market needs.

This is a wonderful and timely initiative. I'm a Concordia grad, and I had the pleasure of working with many Concordia students in the past. These programs can be a global success and help close the gap between Canada's leadership in AI theory and our lagging performance in applications.

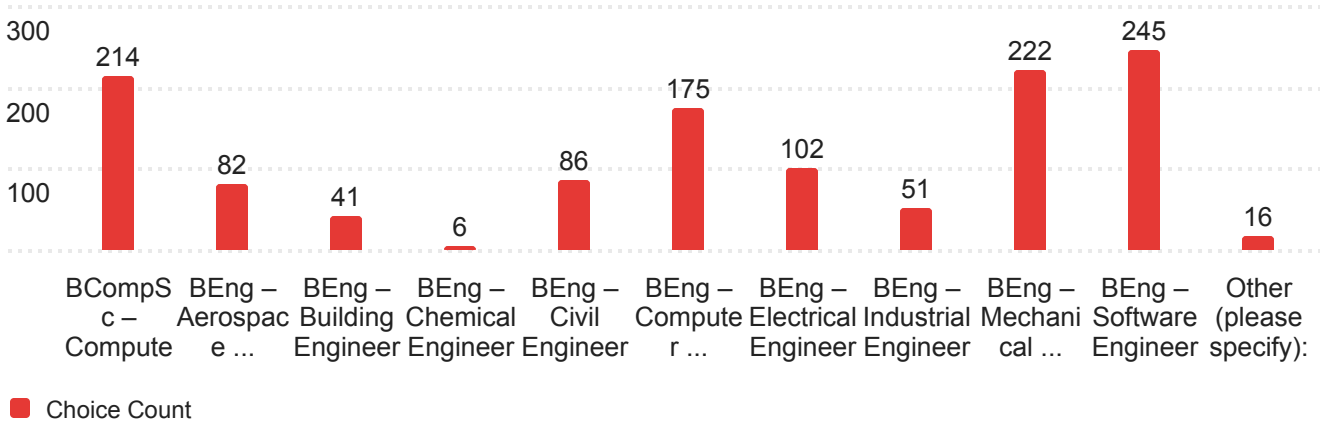
I hope you encourage your students to think deeply about the problems they want to solve with AI. I know teaching undergrads isn't easy, but it's an area where we will rely heavily on the personal responsibility of the next generation of skilled professionals.

Students will need the ability to translate business need in terms of what is possible with AI. How to create MVPs including testing of the data pipeline and data quality.

Be sure to put the bar very high when admitting students or you will be doing them a great disservice. They will have student debt without the chance of ever landing a job.

Q2 - What program are you currently enrolled in? - Selected Choice

1240 Responses



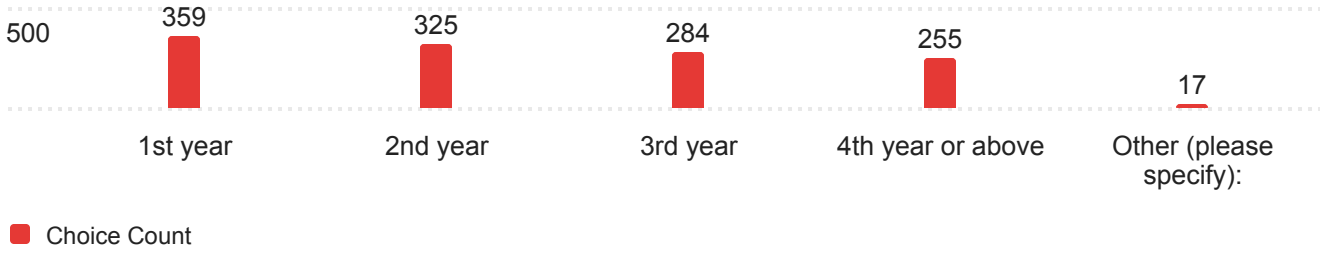
Q2_11_TEXT - Other (please specify): - Text

14 Responses

Other (please specify): - Text
Data Science
BCompsc - Computer Science and Computation Arts
BCompSc Computer Science, Joint Major in Data Science
Computer science and data science
BCompSc - Data Science
BCompSc - Joint major in computation arts and computer science
BCompSc - Health and Life Sciences
BcompSc Data Science
BcompSc Health Life Sciences
BCompSc - Joint Major in Data Science
Compsci Data Science
BCompsSc - Data Science
B.CompSci - Health and Life Sciences
BCompSci - Data Science

Q3 - What is your current year of study? - Selected Choice

1240 Responses

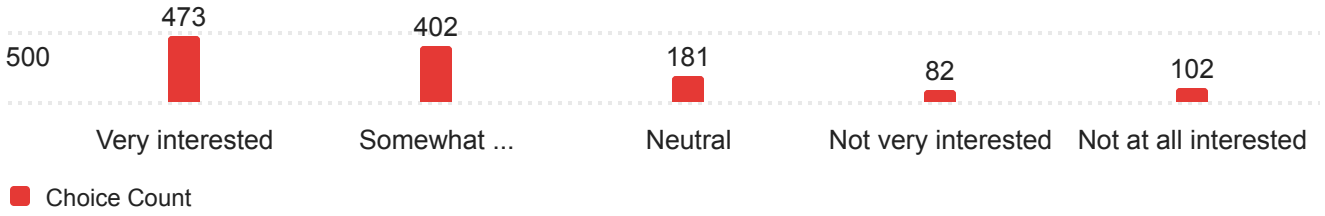


Q3_5_TEXT - Other (please specify): - Text

Other (please specify): - Text
prerequisites
5th
Part time
ECP year
6th year (part time)
Mature student program (extra classes year)
ECP
Year 0 (prerequisites)
5
year 0
5
5th
Been taking classes part time. I am somewhere between 1-2 year
Doing prerequisites
5

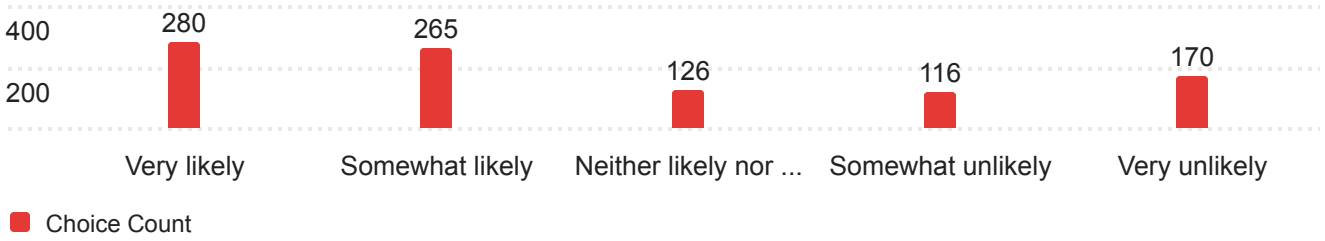
Q4 - How interested are you in AI-related topics (e.g., machine learning, data, robotics, AI software)?

1240 Responses



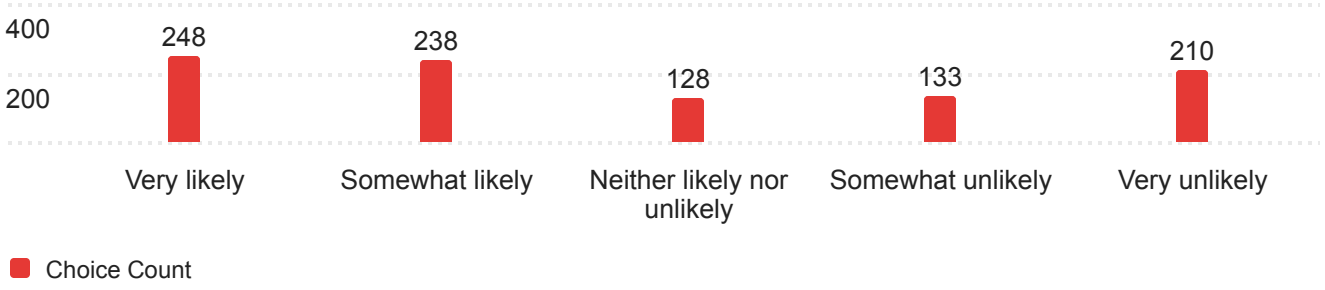
Q6 - Based on this description, how likely is it that you would apply to the BEng in Artificial Intelligence Engineering if it became available today (assuming you were at the stage of choosing a program)?

957 Responses



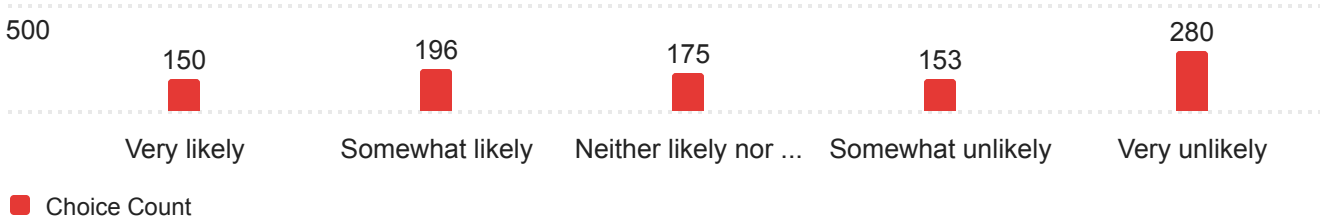
Q7 - If the BEng in Artificial Intelligence Engineering had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

957 Responses



Q8 - How likely is it that you would apply to the BSc in Artificial Intelligence if it became available today (assuming you were at the stage of choosing a program)?

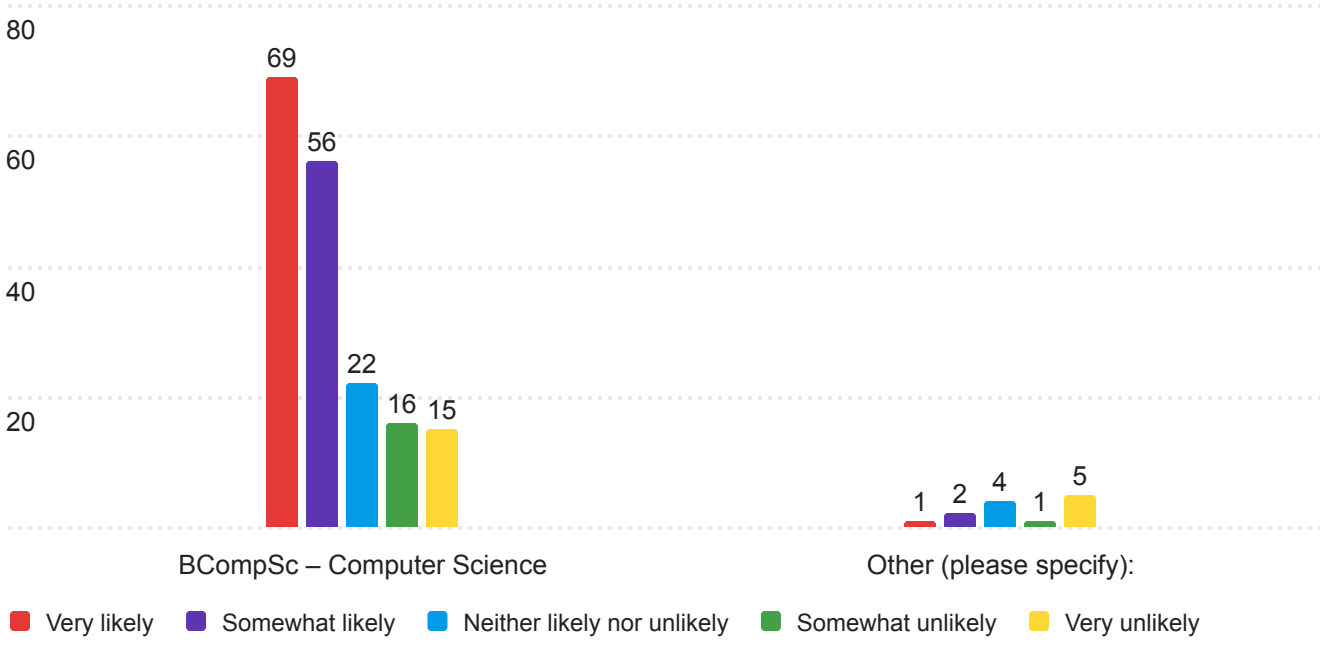
954 Responses



Responses to Q8 from students enrolled in BComp Sc programs, excluding those from engineering students:

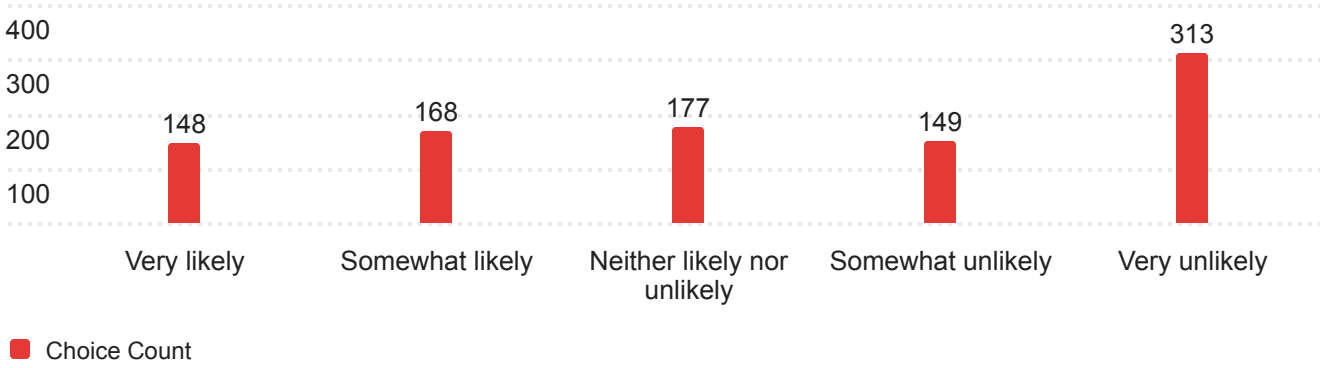
Q8 - How likely is it that you would apply to the BSc in Artificial Intelligence if it became available today (assuming you were at the stage of choosing a program)?

954 Responses



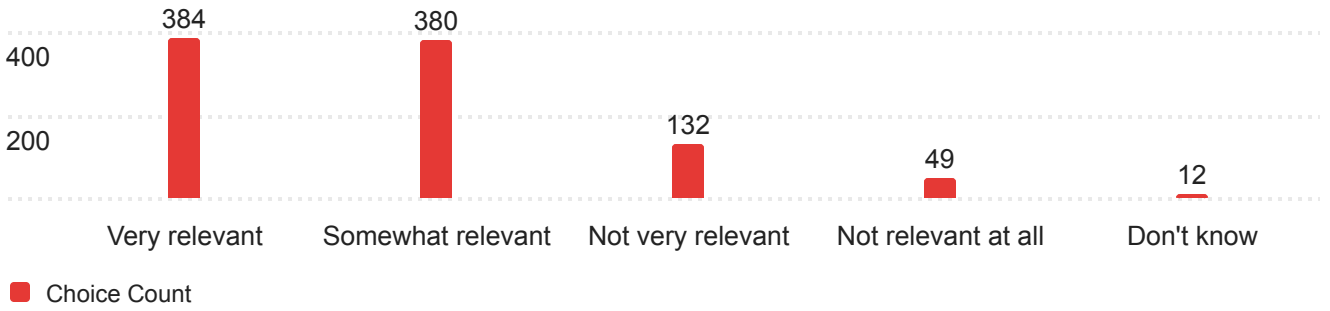
Q9 - If the BSc in Artificial Intelligence had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

955 Responses



Q10 - How relevant do these proposed AI programs feel to your academic and career goals?

957 Responses



Q11 - If you responded, "Not very relevant", "Not relevant at all" or "Don't know", please briefly explain why.

39 Responses

If you responded, "Not very relevant", "Not relevant at all" or "Don't know", please briefly explain why.
I want to make stuff, not have AI make stuff for me
Proposed AI programs are completely unrelated to my current future goals
I don’t really support the Ai movement so I guess I would rather choose a program that doesn’t go against my beliefs
It does not need a dedicated degree a master would be enough
Because who’s gonna hire someone who studied ai
AI can be integrated in building engineering but it isn’t a system that we can depend on, or have a full field of study (university degree) in it yet, it needs many years to be tested and developed until we can offer it to the general public. As AI will continually evolve and so its fundamentals, which will then trigger a need to change the program again to fit.
I personally am not very interested in computer science and programming, so these topics aren't relevant to my current goals
Just have artificial intelligence courses in computer science or software engineering or computer engineering
I just dont know
Learning to develop, and deploy LLMs isn’t a career path that am interested in, as I prefer more of the physical aspects, and hands on creativity mechanical engineering offers. Learning how to effectively use AI in mechanical engineering would be interesting to learn.

As I am studying Civil Engineering, I don't quite understand how nor how much Ai we would use in our field. Apart from writing some form of code on MATLAB and such or to generate floor plans on CAD softwares, I'm not sure how it would apply. Never the less, it still peaks my interest a little, but I would of preffered to keep the old options for specializations.

I feel as though artificial intelligence is too niche of a program. It is a specialization on what instead should be electives. Instead, it should be offered as Comp. Eng w specialization.

I want to go to law school and focus on tech regulation

I plan on becoming a Game Developer, and AI usage is very looked down by the community.

I have little interest in computer software or engineering so these courses do not apply to me very well. In addition I would be more interested in a much more ethics focused course on how to deliver/design artificial intelligence that can be of high quality and productive use as this seems to be a core issue facing AI today that will not be addressed with more engineers but more critical thinkers.

Artificial Intelligence is something that can be explored no matter your engineering discipline. I believe that it is redundant to have an entire program dedicated to it. Having courses around machine learning and algorithms would make sense but not dedicating an entire program. Also from a career perspective as a student going into the job market it is already difficult to find suitable employment with core engineering degrees, I believe having an engineering degree in AI would be less valuable for a student and would make it increasingly difficult to find employment. It is too specific.

i hate ai and think it’s making everyone dumber

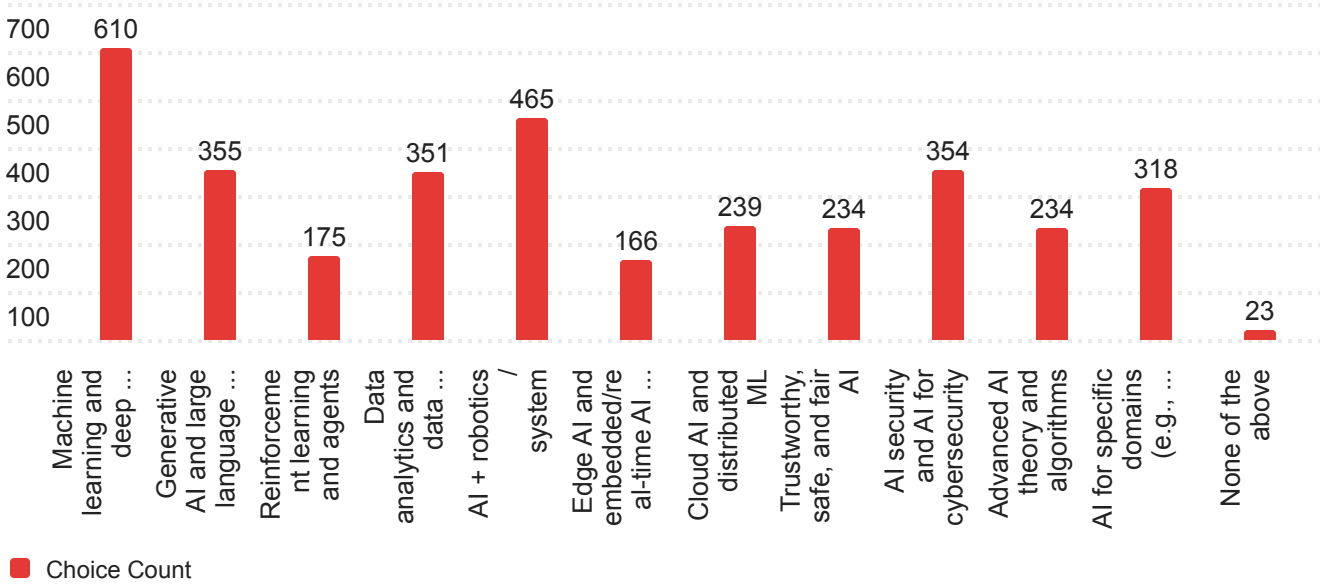
I don’t need advanced machine learning and AI in construction systems industry. That doesn’t mean it’s a bad program or idea it’s just not for me. I think for people interested in that why not go into something broad like software or computer engi.

Don’t give rings to “AI engineers” this is an extension of software. Adjust the software program

illegitimate engineering field. we should not be promoting the use of AI.

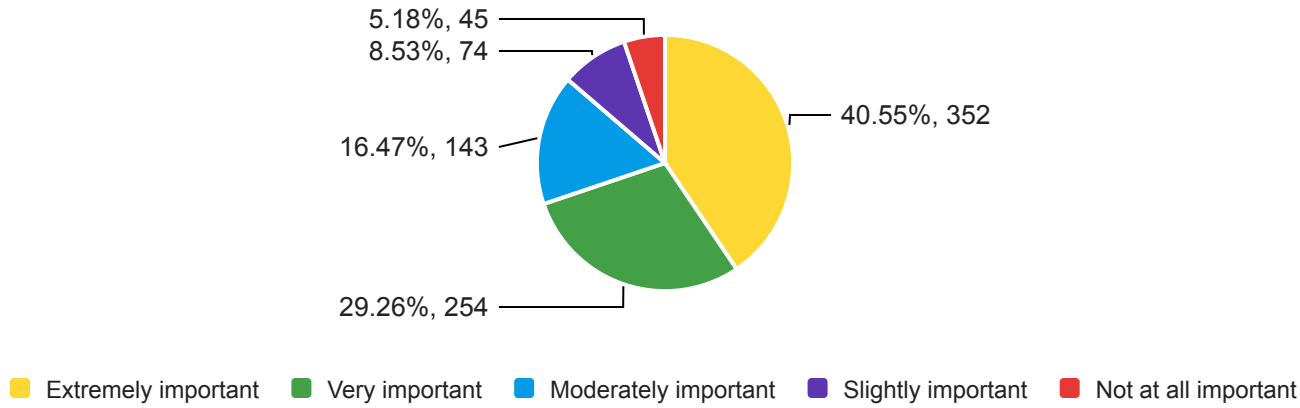
Q12 - Which of the following course areas are most interesting to you? (Select up to 5.)

868 Responses



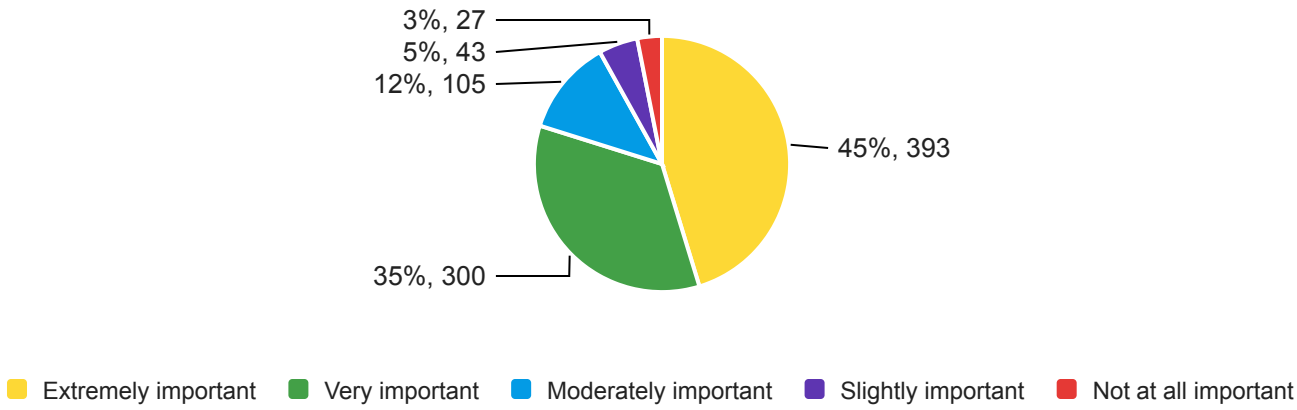
Q13_1 - Co-op or paid internships in AI-related roles

868 Responses



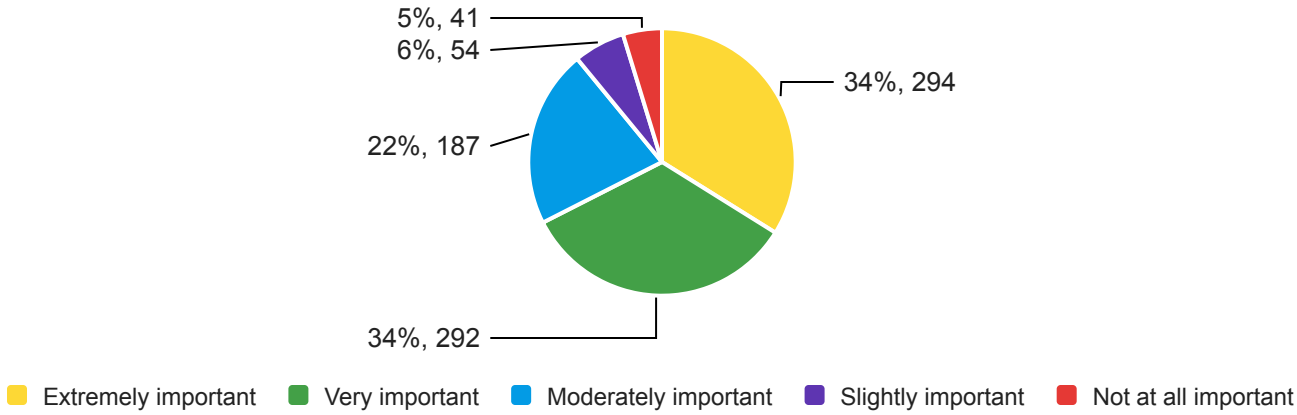
Q13_2 - Hands-on labs and projects using real datasets and tools

868 Responses



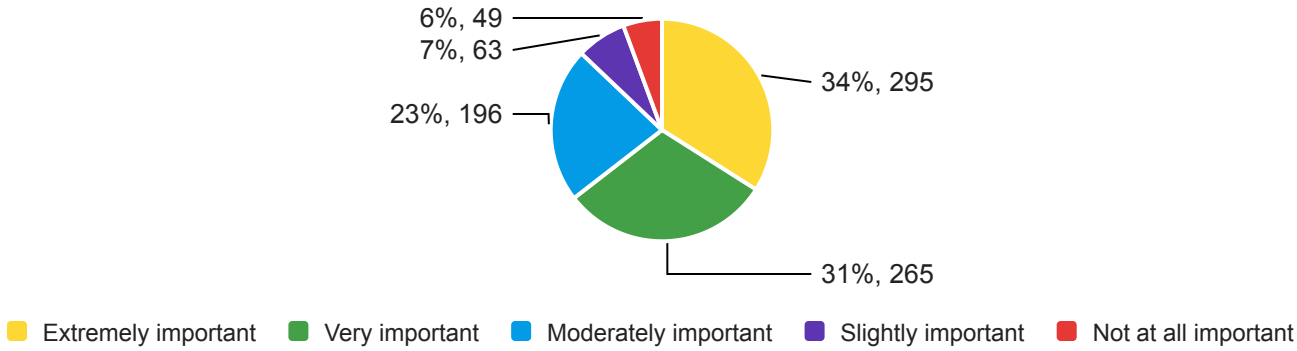
Q13_3 - Industry-sponsored capstone projects

868 Responses



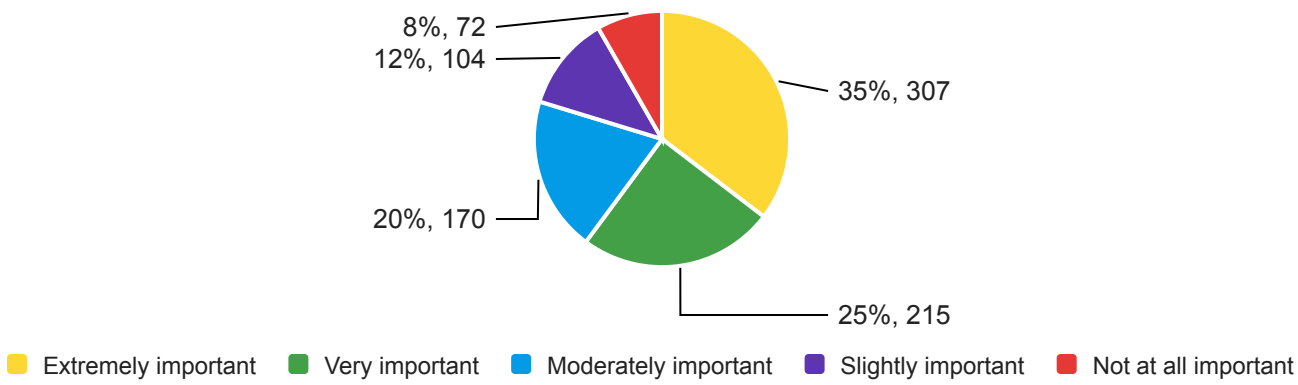
Q13_4 - Opportunities for undergraduate research in AI

868 Responses



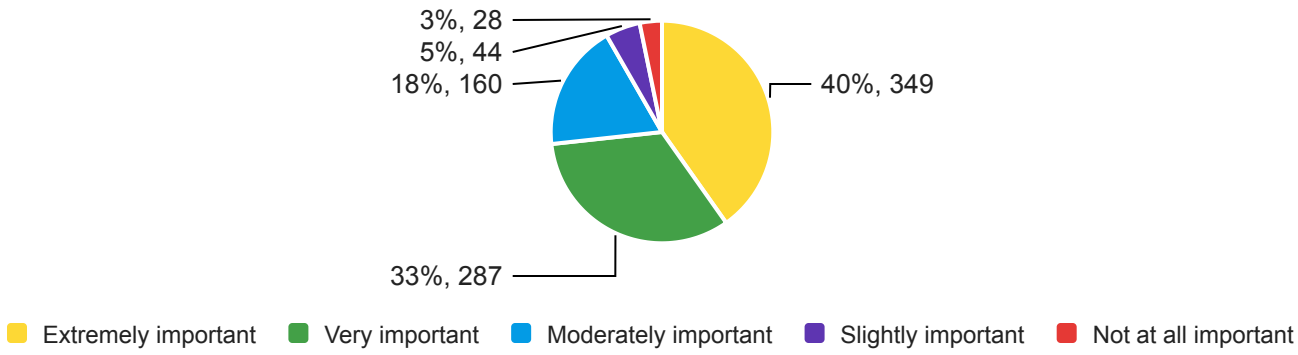
Q13_5 - Courses on ethics, law, and societal impacts of AI

868 Responses



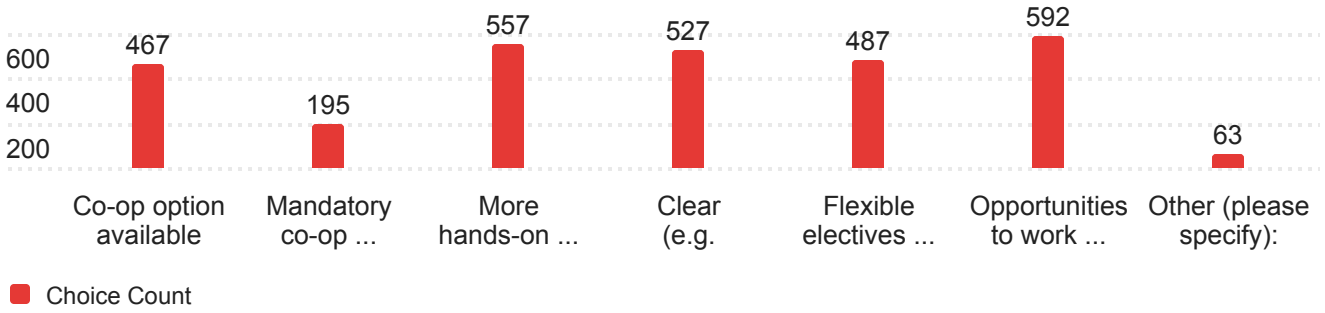
Q13_6 - Access to GPUs / cloud resources for AI projects

868 Responses



Q14 - In what ways could an AI program be made more attractive to students like you? (Select all that apply.) - Selected Choice

868 Responses



Q14_7_TEXT - Other (please specify): - Text

56 Responses

Other (please specify): - Text
Technical electives
I dont know if this works but it the hurtful effects of AI on people and the environement need to be clearly laid out. That way students who dont want to be part of that can opt out or those who stay can try and change things.
It should be a Minor, not a Bachelor, so let's say you complete your Bachelor's degree and then decide to complete a minor in AI
not interested in AI
I wouldn’t focus on an “ai as itself” program but rather a subdivision of ai disciplines. I.e. ai development in robotics or data analysis. I feel like AI in itself is such a broad topic even compared to mech or soft that you wouldn’t get real value from it. Real value would come from specific application learning.
I wish there were an option to tweak the software engineering course with the option to take AI related courses
Prompting: whether it be a stand-alone course or a chapter in a course, prompting is crucial to understanding how to use LLMs in real-world applications.
More emphasis on software constructs, I believe the ENG version is lacking in the software building blocks that form vital components of AI
A clear focus on the ethical aspects of making an AI tool
fair use of intellectual and artistic property, ethics of generative AI, designing power and water efficient AI for sustainability.
work on relevant projects early on, understand the bridge between the heavy math courses and projects early on

none of the above

How is this course different from computer engineering or software engineering or data science degree ?

Intercourse such as AI music

Talking Less about AI

technical electives

A larger focus on long term planning and how to think critically to develop fair systems

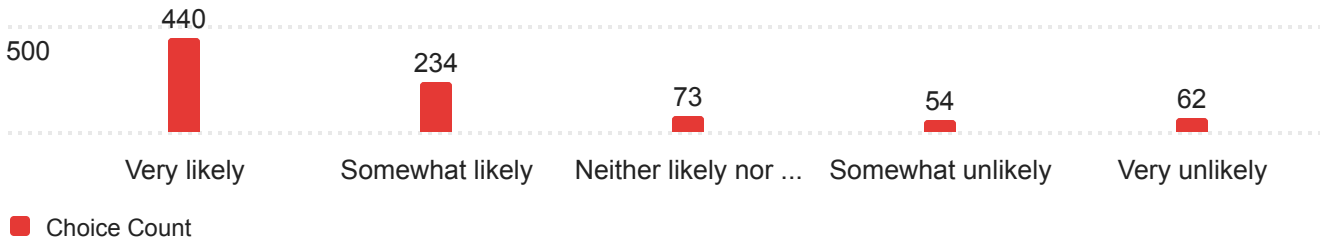
don’t.

Add software engineering courses

None, AI programs could not be attractive to students like me who understand the extreme environment harms of AI and the fact that Concordia is even considering adding these program is harmful and a disgrace to all those working hard to achieve their iron ring.

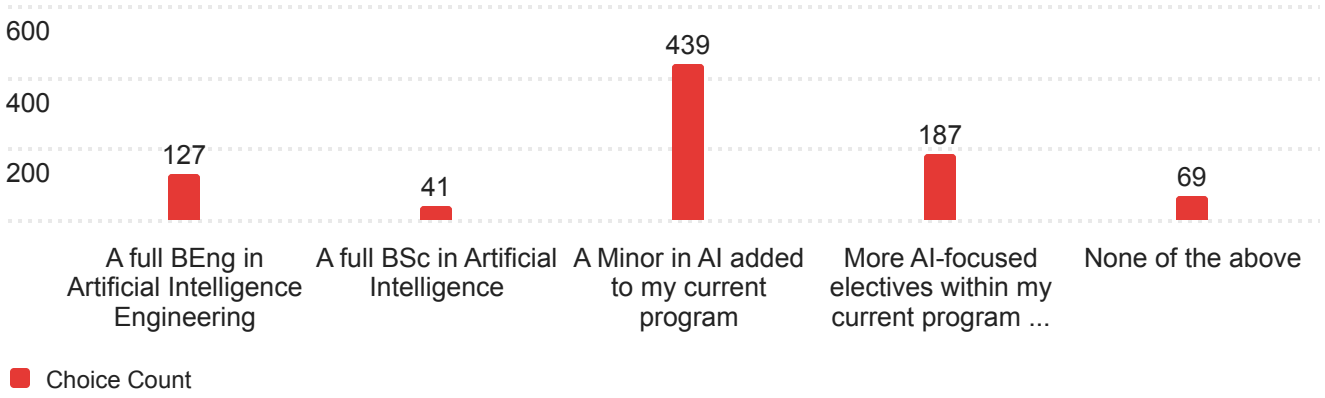
Q15 - If a 25-credit Minor in Artificial Intelligence were available and compatible with your program, how likely is it that you would consider completing it?

863 Responses



Q18 - Looking at your own situation, which of the following would be most appealing to you? (Select one.)

863 Responses



Q19 - What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?

605 Responses

What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?
Because AI is advancing
AI is the future for a lot of companies and a lot of jobs, so knowing about AI and being able to combine it to different areas in my projects or my future jobs, could have a big impact for my qualities.
World is moving toward AI

AI still stays in the domain of computer science, but is more focused on one subject; BCS is currently pretty vague, which can be good if you're not sure, but you don't get specialized in anything

This is where the future is heading. I find many of the current classes and even some of the ai classes to be outdated or useless.

I love learning and I did my internship with a ml and big datasets

To be ahead of the curve and be more specialized in a field that is currently up and coming in hopes it says that way in 4-5 years

Good thing to learn and understand entering the job market nowadays

Demand of Ai in the world

AI is the future and many software engineering concepts being taught are outdated

to follow current market trends and be up to date

Ai is the future it is being used in every industry

I believe that AI at least in it's current phase is not great for people or the environement, especially data centers. So if I were to enter a BEng in AI I would do it in an effort to make AI into a part of society that doesent harm other parts.

Very interested and related to my actual program

I wouldnt choose an AI focused program

It would future-proof my degree.

I have an interest in AI

N/A

to keep up the trend with the industry and where it is heading

Q20 - What is the main reason you would not consider an AI-focused program?

570 Responses

What is the main reason you would not consider an AI-focused program?
Seems like it requires learning a lot of programming
Probably the complex, unknown and hard programming basis
Don’t like coding
If it does not differ much from taking CS with AI electives; if the only thing in AI-focused program is that all AI electives offered in CS are mandatory, there isn't much advantages
Depends on the professors and classes offered. If the material is relevant or not.
It is really specialized and I think that a topic you should get access after the basics of technology. And the uncertainty of that job area is really strong I think a masters is better for that since the people that would go in already would have the basics to go to other software jobs
The way Ai is being presented and forced down our throats gives the impression that it is a very temporary interest in the product
Extra time when I’m already close to graduating
None
I'm worried the reasoning taught by learning traditional programming languages in a SOEN program would be lost, which would negatively impact the understanding of core system problems.
no reason
I dont like AI in it's current form.
Lack of opportunities
Im not interested that much in it
There isn't. I would take if I had the opportunity.
Too specific
I don’t want an AI focused program
N/A - i think at AI course should be taken, minimum 2 - 3
Its too domain specific (compared to general software engineering)

I wonder if LLMs and the overall current state of AI will begin to plateau, leading to a decrease of popularity for the next few years until the next big innovation in this field.

Q21 - Any final comments or suggestions about the proposed AI Engineering or AI programs?

348 Responses

Any final comments or suggestions about the proposed AI Engineering or AI programs?

I think the program is best suited for as an optional elective

It could be nice to have one class "maybe like an introduction" to be able to know what we could learn and also see the possibilities during our BEng, like that probably for a major someone could specify in AI engineering

Not exactly sure what the difference is between these AI engineering programs compared to Software engineering. Could they be incorporated into software engineering instead of creating completely new programs?

Ya, don't have profs teaching stuff about AI that was relevant in 2010. Make most of the course tailored to what is actually happening NOW. Some of the 400 ai classes I have taken are a joke.

It should be a masters more than anything.

Sounds like a great idea!

If I can do double majors, it would be great, in this way I'll be able to finish my aerospace engineering along with Ai engineering

This is a fantastic initiative. I think there should be a significant focus on using modern, industry-leading tools like Claude Code or ChatGPT to train passage from programmatic to free-form (prompts) in AI systems.

Much like engineers need to understand that their inventions and policies will affect people's lives AI engineers need to understand this even more because of the changing technological climate.

Keep me informed please !

I would appreciate it if making a new AI program in engineering wouldnt mean we compromise the options and technical electives for other programs such as civil engineering just to compensate and complete this new program at the cost of other students preplanned track

I think it is a good idea and should be implemented.

I love it, I wish I could take it

N/A

Make students valuable. We need a chance to survive in this world

Interesting

AI is not as good as people think because all the ideas are the same, and the market is saturated with many similar ideas in large amounts

as a computer Science student, I am really interested in AI-focused programs as minor and if they'll be available, I would definitely apply for it

no

I'm reassured that the university that I'm attending, thinks about thoughtfully adapting to the changes in our daily lives, and providing us students, courses that reflect relevant needs in our societies.

Gina Cody School of Engineering and Computer Science - Help develop our new AI program

Please take a few minutes to complete our survey and share your thoughts on what you want from an undergraduate program in AI.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

1. What is your current or most recent level of education?

- ◯ French CEGEP (Quebec)
- ◯ English CEGEP (Quebec)
- ◯ High school (Canada)
- ◯ High school (International)
- ◯ Other

2. Are you currently exploring multiple program options before making your final decision?

- ◯ Yes
- ◯ No

3. Have you researched undergraduate programs related to artificial intelligence (AI)?

- ◯ Yes
- ◯ No

4. On a scale from 1 to 5, how would you rate your current level of interest in AI? (1 = Not interested, 5 = Extremely interested)

   - ◯ 1
   - ◯ 2
   - ◯ 3
   - ◯ 4
   - ◯ 5

5. This proposed program would be offered as a Bachelor of Engineering (B.Eng.) in Artificial Intelligence Engineering and a B.Sc. in Artificial Intelligence. The B.Eng. focuses on designing and building AI enabled systems from an engineering perspective (e.g., software, hardware, robotics, data and infrastructure) and the B.Sc. focuses on algorithms, theory and software for AI rather than only studying AI concepts in other disciplines. If such an AI program were offered, how interested would you be in applying? (1 = Not at all interested, 5 = Extremely interested)

   - ◯ 1
   - ◯ 2
   - ◯ 3
   - ◯ 4
   - ◯ 5

6. When you think about studying AI, which type of program interests you most? (Choose all that apply.)

   - ◯ An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).

- ◯ A computer science program (B.Sc.) that focuses on algorithms, theory and software for AI.
- ◯ A business / management program that focuses on using AI in organizations.
- ◯ I am not sure / I need more information.

7. What factors would influence your decision to consider an Artificial Intelligence program or related programs at our university? (Select all that apply)

- ☐ Reputation of the program
- ☐ Availability of co-op program
- ☐ Location of the university
- ☐ Course offerings
- ☐ Faculty expertise
- ☐ Scholarships or financial aid
- ☐ Career opportunities in the field

- [ ] Other

8. Name (optional):

Enter your answer

9. Email (optional)

Enter your answer

10. Do you agree that we email you further information about the Artificial Intelligence program?

- ◯ Yes
- ◯ No

11. Do you have any additional comments or suggestions related to an AI program or other programs you are exploring?

Enter your answer

CEGEP Student Open House Survey Results

Respondent ID	What is your current or most recent level of education?	Are you currently exploring multiple program options for your post-secondary studies?	Have you researched undergraduate programs related to artificial intelligence (AI)?	On a scale from 1 to 5, how would you rate your current level of interest in AI? (1 = Not interested, 5 = Extremely interested)	This proposed program would be offered as a Bachelor of Engineering (B.Eng.) in Artificial Intelligence Engineering and a B.Sc. in Artificial Intelligence. The B.Eng. focuses on designing and building	When you think about studying AI, which type of program interests you most? (Choose all that apply.)	What factors would influence your decision to consider an Artificial Intelligence program or related programs at our university? (Select all that apply)	Do you have any additional comments or suggestions related to an AI program or other programs you are exploring?
1	English CEGEP (Quebec)	Yes	Yes	5			Reputation of the program;Availability of co-op program;Location of the university;Course offerings;Faculty expertise;Scholarships or financial aid;Career opportunities in the field	
2	French CEGEP (Quebec)	Yes	No	4			Availability of co-op program;Faculty expertise;Career opportunities in the field	
3	International Diploma	Yes	Yes	5			Reputation of the program;Availability of co-op program;Faculty expertise;Career opportunities in the field;Course offerings	
4	High school (Canada)	Yes	No	4			Career opportunities in the field	
5	French CEGEP (Quebec)	Yes	Yes	4			Course offerings;Career opportunities in the field;Scholarships or financial aid;Reputation of the program;Availability of co-op program	
7	English CEGEP (Quebec)	No	No	4			Availability of co-op program;Course offerings;Career opportunities in the field	
8	High school (International)	Yes	No	4	4	An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).	Availability of co-op program;Career opportunities in the field	Very exciting
9	English CEGEP (Quebec)	Yes	No	4	5	A computer science program (B.Sc.) that focuses on algorithms, theory and software for AI.;An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).	Availability of co-op program;Faculty expertise;Career opportunities in the field	
10	Bachelorsfinal year	Yes	Yes	4	1	I am not sure / I need more information.	Scholarships or financial aid	Quantum computing is emerging field and I guess that subject you should offer though and I want masters in this as I'm gonna complete my bachelor this year. Regards
11	English CEGEP (Quebec)	Yes	No	4	4	An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).	Course offerings;Faculty expertise;Career opportunities in the field	
12	French CEGEP (Quebec)	No	Yes	4	2	A computer science program (B.Sc.) that focuses on algorithms, theory and software for AI.	Career opportunities in the field	

Job Posting Analytics

Lightcast Q3 2025 Data Set

March 2026

1455 Boulevard de Maisonneuve O

Parameters

Select Timeframe: Feb 2016 - Feb 2026

Posting Language: All Postings

Lightcast Occupations:

Results should include

Code	Description
231113	Data / Data Mining Analyst
231114	Data Scientist
231118	Analytics Manager
231120	Artificial Intelligence Engineer
231210	Data Engineer
231213	Database Architect
231510	Computer Systems Engineer / Architect
231514	Technology Consultant
231715	Software Developer / Engineer

Regions:

Code	Description
01	Canada

Advertised Salary: Include all postings regardless

Minimum Experience Required: Any

Education Level: Any

Job Type: Include Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search: "Artificial Intelligence" or "AI"

Posting Type: Active Postings

Job Postings Overview

15,508	1,862	2 : 1
Unique Postings	**Companies Posting**	**Posting Intensity**
31,346 Total Postings	419,633 Total Companies	Regional Average: 3 : 1

Advertised Salary

*There are **1,855** advertised salary observations (12% of the 15,508 matching postings).*

$54.58/hr

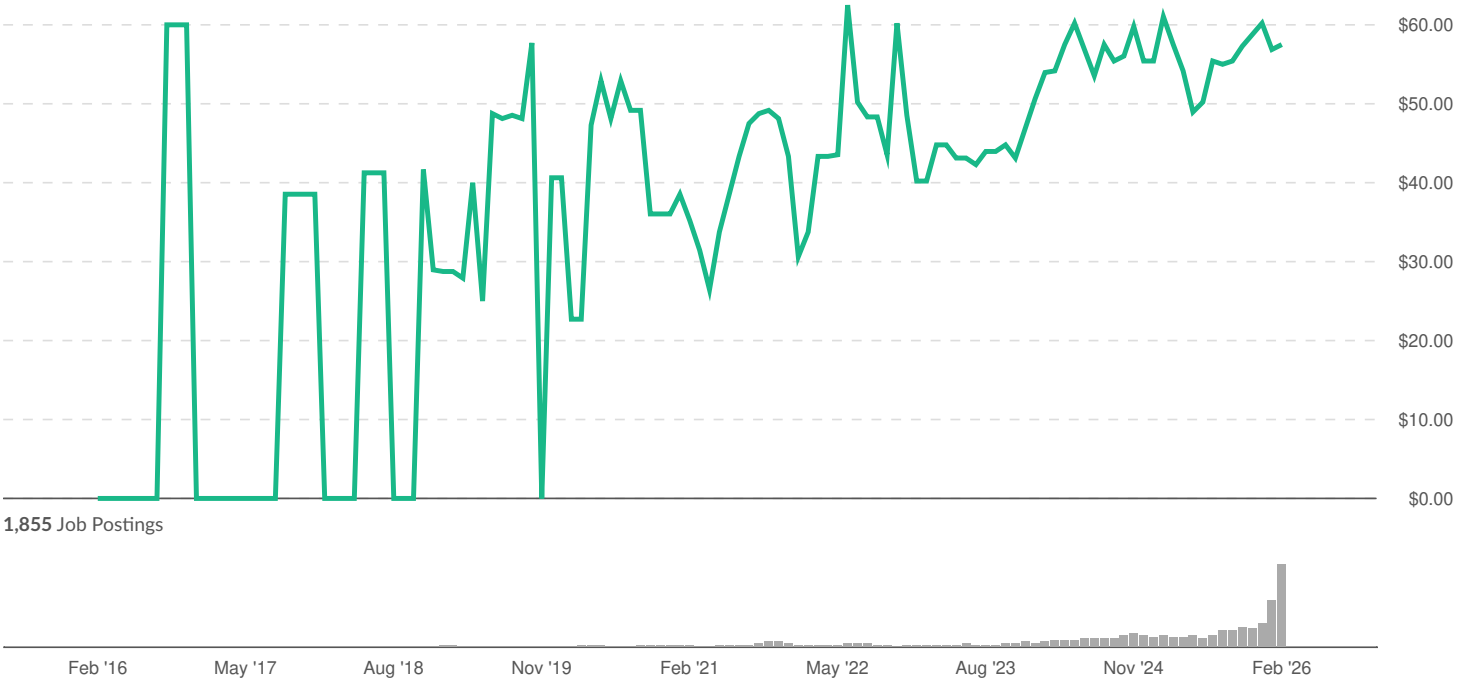
Median Advertised Salary



Advertised Salary Trend

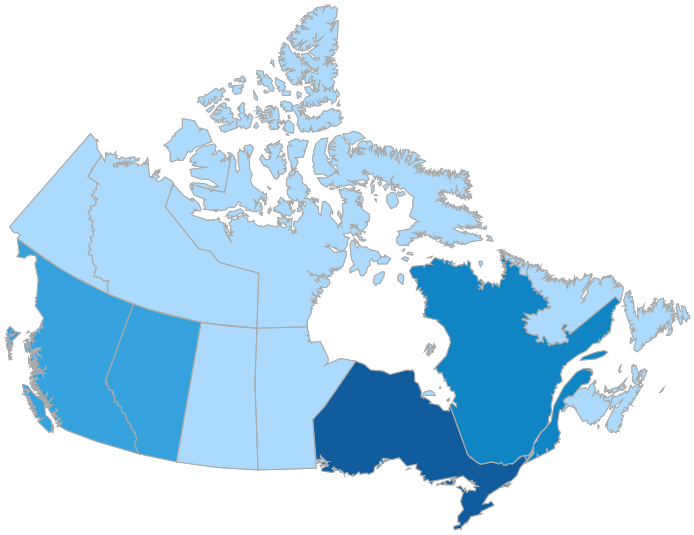
▲0.0% Feb 2016 – Feb 2026

$54.58 **Median**



1,855 Job Postings

Job Postings Regional Breakdown



Province	Unique Postings (Feb 2016 - Feb 2026)
Ontario	9,017
Quebec	2,390
British Columbia	1,552
Alberta	1,027
Nova Scotia	331

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Feb 2026	2,149	2 : 1
Jan 2026	1,669	2 : 1
Dec 2025	1,354	2 : 1
Nov 2025	1,159	3 : 1
Oct 2025	1,164	3 : 1
Sep 2025	1,065	3 : 1
Aug 2025	1,151	3 : 1
Jul 2025	894	3 : 1
Jun 2025	695	3 : 1
May 2025	712	2 : 1
Apr 2025	640	2 : 1
Mar 2025	543	2 : 1
Feb 2025	542	2 : 1
Jan 2025	518	2 : 1
Dec 2024	487	2 : 1
Nov 2024	491	3 : 1
Oct 2024	530	3 : 1
Sep 2024	459	3 : 1
Aug 2024	490	3 : 1
Jul 2024	380	3 : 1

Jun 2024	348	2 : 1
May 2024	311	2 : 1
Apr 2024	293	2 : 1
Mar 2024	300	2 : 1
Feb 2024	338	2 : 1
Jan 2024	250	2 : 1
Dec 2023	245	2 : 1
Nov 2023	261	2 : 1
Oct 2023	241	2 : 1
Sep 2023	211	2 : 1
Aug 2023	182	2 : 1
Jul 2023	238	2 : 1
Jun 2023	275	2 : 1
May 2023	262	2 : 1
Apr 2023	256	2 : 1
Mar 2023	273	2 : 1
Feb 2023	280	2 : 1
Jan 2023	314	2 : 1
Dec 2022	304	2 : 1
Nov 2022	436	2 : 1
Oct 2022	479	2 : 1
Sep 2022	466	2 : 1
Aug 2022	474	2 : 1
Jul 2022	477	2 : 1
Jun 2022	331	2 : 1
May 2022	355	2 : 1
Apr 2022	355	2 : 1
Mar 2022	362	2 : 1
Feb 2022	338	2 : 1
Jan 2022	319	2 : 1
Dec 2021	790	2 : 1

Nov 2021	777	2 : 1
Oct 2021	322	2 : 1
Sep 2021	323	2 : 1
Aug 2021	302	2 : 1
Jul 2021	277	2 : 1
Jun 2021	251	2 : 1
May 2021	249	2 : 1
Apr 2021	260	2 : 1
Mar 2021	235	2 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	4,287	28%
High school or GED	181	1%
Associate's degree	246	2%
Bachelor's degree	8,612	56%
Master's degree	6,245	40%
Ph.D. or professional degree	2,931	19%

Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	181	0	1%
Associate's degree	242	0	2%
Bachelor's degree	8,281	278	53%
Master's degree	2,025	3,129	13%
Ph.D. or professional degree	492	2,439	3%

Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	6,735	43%
0 - 1 Years	472	3%
2 - 3 Years	2,621	17%
4 - 6 Years	3,583	23%
7 - 9 Years	1,280	8%
10+ Years	817	5%

Top Companies Posting

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
IBM	1,719 / 858	2 : 1	
Deloitte	2,369 / 851	3 : 1	
Funded.club	772 / 431	2 : 1	
AMD	858 / 404	2 : 1	
Cognizant Technology Solutions	617 / 350	2 : 1	
Google	725 / 312	2 : 1	
Bell Canada	757 / 312	2 : 1	
NTT DATA	763 / 292	3 : 1	
Sanofi	613 / 259	2 : 1	
TD Bank	975 / 257	4 : 1	

Top Cities Posting

City	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Toronto, ON	10,425 / 4,836	2 : 1	
Montreal, QC	3,331 / 1,580	2 : 1	
Vancouver, BC	2,166 / 1,123	2 : 1	
Markham, ON	2,016 / 870	2 : 1	
Ottawa, ON	1,449 / 781	2 : 1	
Mississauga, ON	1,408 / 618	2 : 1	
Calgary, AB	1,124 / 546	2 : 1	
Edmonton, AB	584 / 282	2 : 1	
Halifax, NS	605 / 267	2 : 1	
Waterloo, ON	691 / 264	3 : 1	

Top Posted Occupations

Occupation (NOC)	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data scientists	13,480 / 6,340	2 : 1	
Software developers and programmers	8,063 / 4,370	2 : 1	
Database analysts and data administrators	3,386 / 1,548	2 : 1	
Software engineers and designers	2,282 / 1,209	2 : 1	
Computer engineers (except software engineers and designers)	1,976 / 1,080	2 : 1	
Information systems specialists	1,133 / 491	2 : 1	
Mathematicians, statisticians and actuaries	953 / 440	2 : 1	
Professional occupations in business management consulting	73 / 30	2 : 1	

Top Posted Occupations

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Software Developer / Engineer	10,345 / 5,579	2 : 1	
Artificial Intelligence Engineer	7,310 / 3,487	2 : 1	
Data Scientist	5,163 / 2,370	2 : 1	
Computer Systems Engineer / Architect	1,976 / 1,080	2 : 1	
Database Architect	2,045 / 966	2 : 1	
Data / Data Mining Analyst	1,414 / 612	2 : 1	
Technology Consultant	1,133 / 491	2 : 1	
Data Engineer	1,009 / 485	2 : 1	
Analytics Manager	951 / 438	2 : 1	

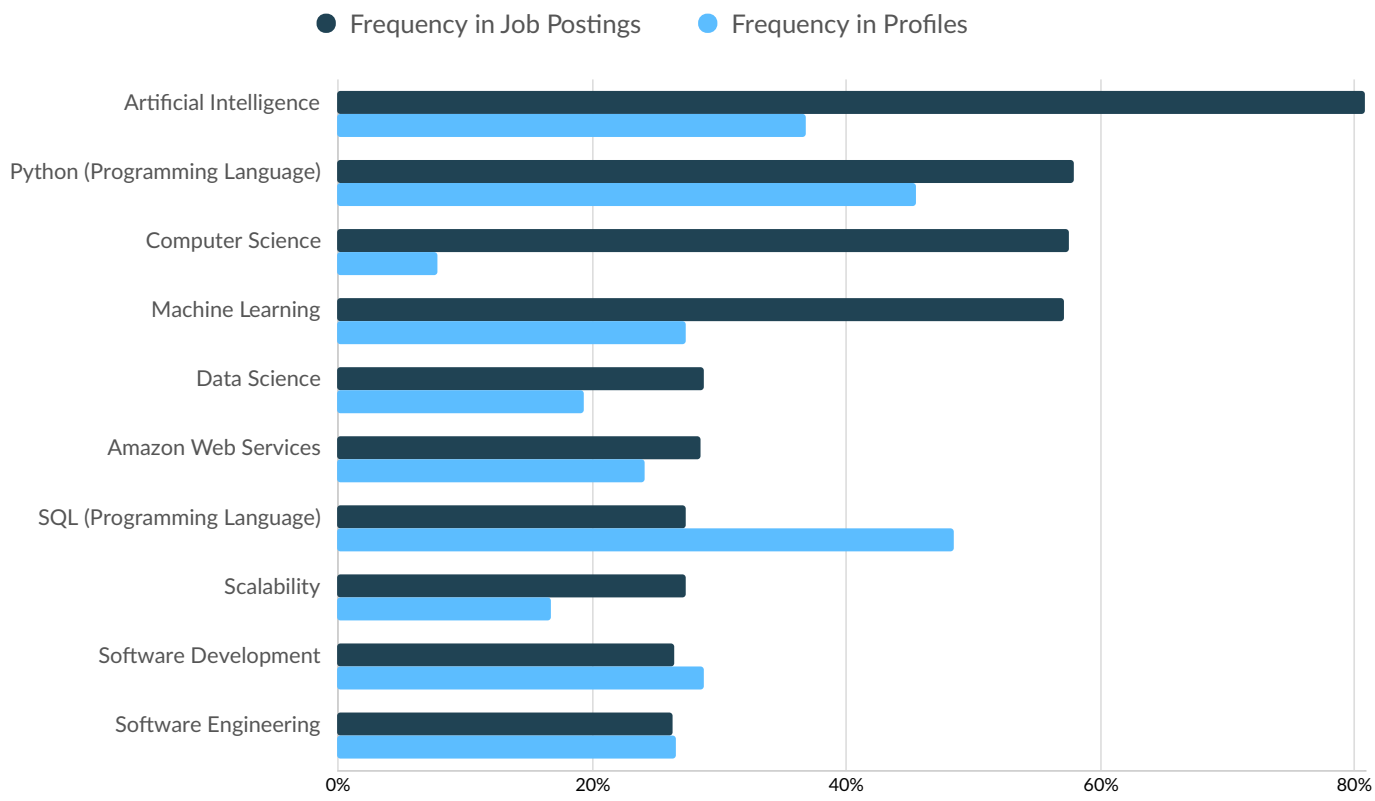
Top Posted Job Titles

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data Scientists	2,252 / 1,002	2 : 1	
Software Developers	1,709 / 872	2 : 1	
Machine Learning Engineers	808 / 398	2 : 1	
Software Engineers	687 / 283	2 : 1	
Artificial Intelligence Engineers	436 / 255	2 : 1	
Full Stack Developers	568 / 253	2 : 1	
Data Engineers	485 / 244	2 : 1	
Artificial Intelligence Managers	478 / 241	2 : 1	
Data Science Managers	448 / 194	2 : 1	
Solutions Architects	224 / 145	2 : 1	

Top Industries

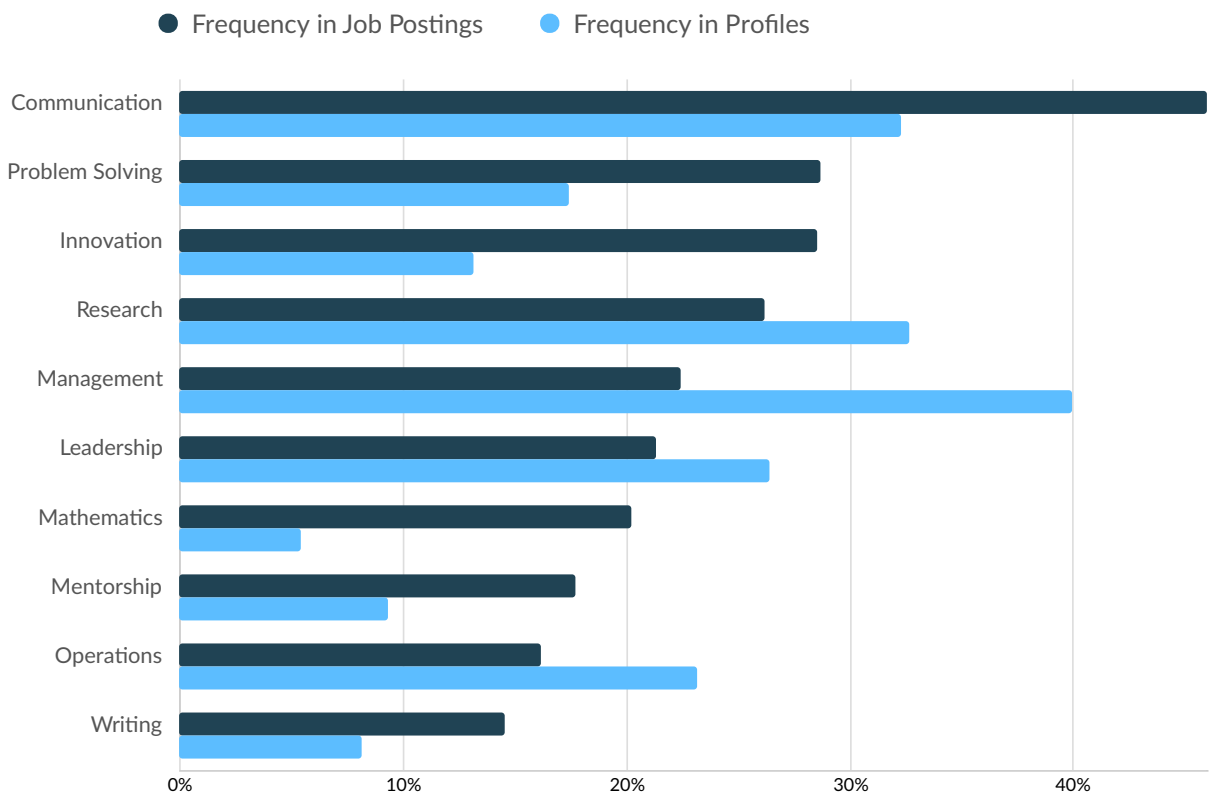
	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Commercial Banking	3,365 / 1,119	3 : 1	
Administrative Management and General Management Consulting Services	2,483 / 923	3 : 1	
Computer Terminal and Other Computer Peripheral Equipment Manufacturing	1,740 / 876	2 : 1	
Custom Computer Programming Services	1,668 / 796	2 : 1	
Software Publishers	1,348 / 646	2 : 1	
Offices of Certified Public Accountants	1,163 / 538	2 : 1	
Semiconductor and Related Device Manufacturing	1,031 / 504	2 : 1	
Web Search Portals and All Other Information Services	948 / 445	2 : 1	
Other Scientific and Technical Consulting Services	695 / 390	2 : 1	
Direct Property and Casualty Insurance Carriers	515 / 367	1 : 1	

Top Specialized Skills



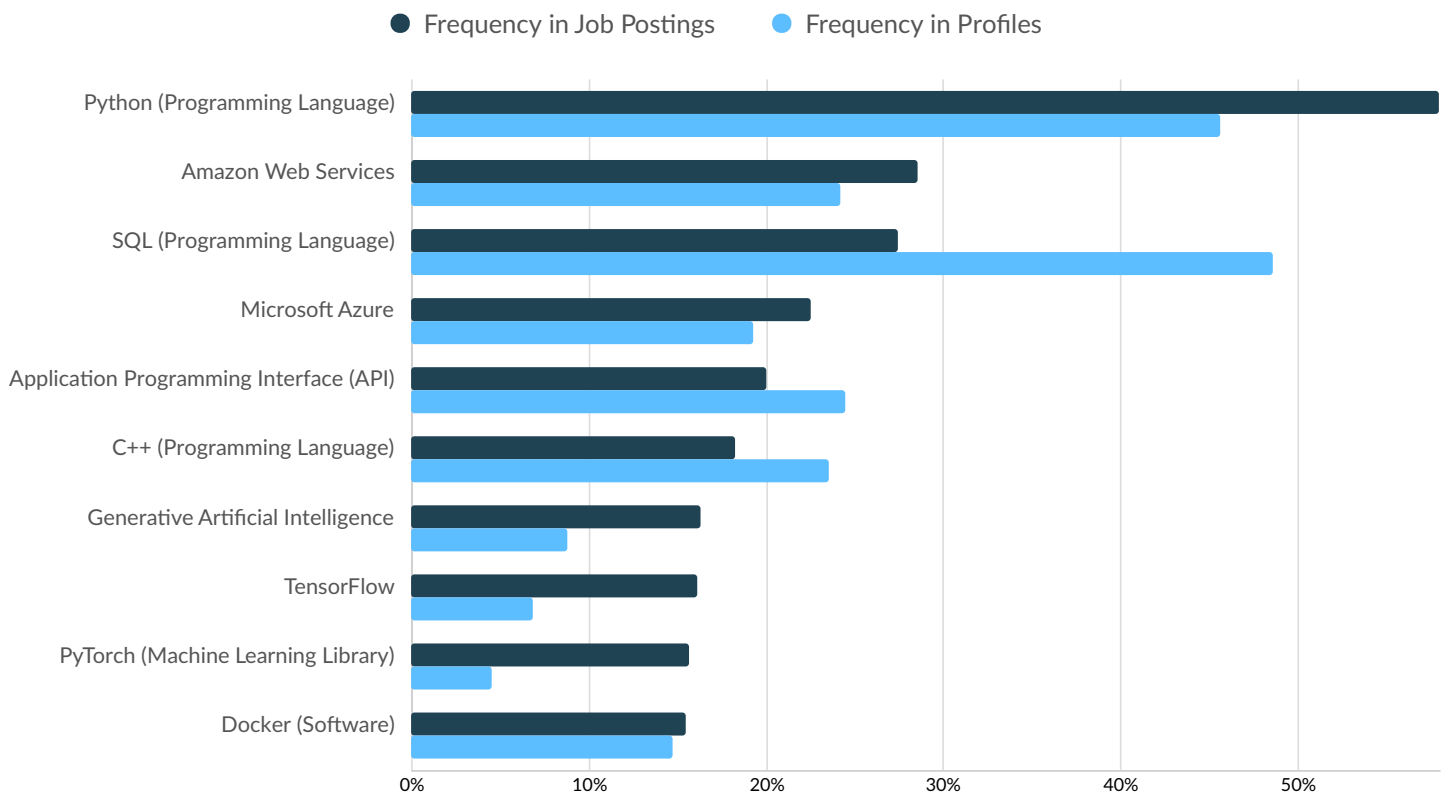
	Postings	% of Total Postings	Profiles	% of Total Profiles
Artificial Intelligence	12,546	81%	31,222	37%
Python (Programming Language)	8,989	58%	38,623	46%
Computer Science	8,924	58%	6,717	8%
Machine Learning	8,880	57%	23,307	28%
Data Science	4,481	29%	16,422	19%
Amazon Web Services	4,433	29%	20,538	24%
SQL (Programming Language)	4,259	27%	41,169	49%
Scalability	4,254	27%	14,274	17%
Software Development	4,106	26%	24,483	29%
Software Engineering	4,105	26%	22,559	27%

Top Common Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Communication	7,135	46%	27,367	32%
Problem Solving	4,447	29%	14,770	17%
Innovation	4,431	29%	11,147	13%
Research	4,062	26%	27,708	33%
Management	3,480	22%	33,864	40%
Leadership	3,307	21%	22,415	26%
Mathematics	3,145	20%	4,602	5%
Mentorship	2,749	18%	7,894	9%
Operations	2,512	16%	19,622	23%
Writing	2,265	15%	6,932	8%

Top Software Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Python (Programming Language)	8,989	58%	38,637	46%
Amazon Web Services	4,435	29%	20,549	24%
SQL (Programming Language)	4,261	27%	41,191	49%
Microsoft Azure	3,501	23%	16,330	19%
Application Programming Interface (API)	3,108	20%	20,772	25%
C++ (Programming Language)	2,838	18%	19,979	24%
Generative Artificial Intelligence	2,527	16%	7,465	9%
TensorFlow	2,509	16%	5,851	7%
PyTorch (Machine Learning Library)	2,432	16%	3,852	5%
Docker (Software)	2,407	16%	12,473	15%

Top Qualifications

	Postings with Qualification
Master Of Business Administration (MBA)	179
Microsoft Certified Professional	160
Security Clearance	154
Certified Information Systems Security Professional	90
Secret Clearance	70
Project Management Professional Certification	65
Valid Driver's License	60
Certified Information Security Manager	52
Microsoft Certified: Azure Solutions Architect Expert	48
Microsoft Azure Certification	43

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2016 - Feb 2026)
jobs.ca	2,495
indeed.com	2,049
myworkdayjobs.com	1,446
localwork.ca	1,238
adzuna.ca	1,071
workopolis.com	1,015
careerjet.ca	900
dejobs.org	690
jobillico.com	650
brassring.com	485
tiptopjob.com	458
theitjob.com	434
lever.co	396
fairygodboss.com	343
cognizant.com	323
careerbeacon.com	295
deloitte.ca	272
themuse.com	266
icims.com	248
amd.com	232
glassdoor.ca	217
taleo.net	213
jobbank.gc.ca	205
greenhouse.io	172
option-carriere.ca	151

Appendix B

Sample Postings

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom Services
Job Title: Artificial Intelligence/Machine Learning Engineers	

1229 Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning)

Engineerhttps:

//www.careerbeacon.com/posting/632654/procom-services/ingenieur-intelligence-articifielle

- span class="jpa-keyword-highlight">artificial
- span class="jpa-keyword-highlight">intelligence-machine-learning-engineer/montreal/?sref=emptyProcom Services
- Montral, QC Ingnieur Intelligence Articifielle /

Artificial Intelligence (Machine learning) Engineer Information Technology Procom Services Montral, Quebec Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de l'assurance. Notre client est situ Montral. Description des tches et responsabilits

- Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste
- Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details

- Artificial Intelligence (Machine learning) Engineer
- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, API's, Apps, NUI's et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills
- Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelor's Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy AI & machine learning software products Assignment Length6 months Contract
- Renewable or Permanent position Start dateImmediately Reference number

BH 232775

Apply

UI Developers — Ascenda Corporation in Winnipeg, MB (Sep 2017 - Nov 2017)

AI Developer

Link to Live Job Posting: Posting is no longer active

Location: Winnipeg, MB	**Company:** Ascenda Corporation
Job Title: UI Developers	

AI

Developer Job Location :

Winnipeg (Winnipeg Metropolitan, Manitoba, Canada)

Job Salary :

Competitive Posted On :

22 September 2017

Job Description :

Job Description

- h3•ABOUT THE JOB We are changing the way people think about customer service by leveraging

Artificial Intelligence, and we need your help! We are seeking an Artificial Intelligence Developer to help design, develop and implement AI technology We're looking for an entrepreneurial mindset, a fearless attitude and a passion to take AI to the customer service world You will be responsible for analyzing existing business process and drive the implementation of AI technologies across our company You will also work with a team of developers in the analysis, design, development, and maintenance of software solutions

JOB REQUIREMENTS

- A minimum of 5 years of technical software development experience, with specific experience in solution design and implementation
- Experience in practical machine learning development is required
- Experience in NET (C#) development is preferred
- Experience in Continuous Integration/Automated Deployment is preferred
- Experience working with Agile software development methodologies is preferred
- Significant experience with data integration and reporting is preferred
- Ability to prioritize and plan work activities as needed, while meeting aggressive deadlines and handle multiple and complex projects
- Excellent communication skills, with the ability to coach and mentor other team membersCompany Description
- h3•For information on our organization visit: 24-7intouch/careers

AI Developer

UI Developers — Unclassified in Winnipeg, MB (Sep 2017 - Nov 2017)

AI Developer

Link to Live Job Posting: Posting is no longer active

Location: Winnipeg, MB	**Company:** Unclassified
Job Title: UI Developers	

AI DeveloperAI Developer 24-7

Intouch Contact Cent Location :

Winnipeg•

Winnipeg Metropolitan, Manitoba, Canada Type :

Permanent Jobs Salary :

Competitive Main Industry :

Search Information Technology Jobs Job ID :

72344262

Posted On :

22 September 2017 Job Description

- h3•ABOUT THE JOB We are changing the way people think about customer service by leveraging

Artificial Intelligence, and we need your help! We are seeking an Artificial Intelligence Developer to help design, develop and implement AI technology. We're looking for an entrepreneurial mindset, a fearless attitude and a passion to take AI to the customer service world. You will be responsible for analyzing existing business process and drive the implementation of AI technologies across our company. You will also work with a team of developers in the analysis, design, development, and maintenance of software solutions.

JOB REQUIREMENTS

- A minimum of 5 years of technical software development experience, with specific experience in solution design and implementation
- Experience in practical machine learning development is required
- Experience in .NET (C#) development is preferred
- Experience in Continuous Integration/Automated Deployment is preferred
- Experience working with Agile software development methodologies is preferred
- Significant experience with data integration and reporting is preferred
- Ability to prioritize and plan work activities as needed, while meeting aggressive deadlines and handle multiple and complex projects
- Excellent communication skills, with the ability to coach and mentor other team membersCompany Description
- h3•For information on our organization visit: 24-7intouch/careers

AI Developer

Artificial Intelligence & Machine Learning Research Scientist - Auton

Link to Live Job Posting: Posting is no longer active

Location: Markham, ON	**Company:** General Motors
Job Title: Machine Learning Research Scientists	

Canada United States Artificial Intelligence & Machine Learning Research Scientist - Autonomous Markham, Ontario, Canada Position summary Artificial Intelligence & Machine Learning Research Scientist - Autonomous - ENG0034116 Description Automated Driving is a major growth area in the automotive industry. General Motors Global Research and Development offers exciting opportunity for talented and motivated researchers and engineers in this area. We are looking for individual contributors who are capable of driving design solutions and prototyping advanced artificial intelligence/machine learning techniques to stretch the capability of GM autonomous vehicle research and development programs. They will conduct research and development to identify new Artificial Intelligence (AI) / Machine Learning (ML) technology paradigms for future GM vehicles, develop prototype software on GM test vehicles for state-of-the-art supervised, unsupervised and reinforcement machine learning techniques. They will contribute to GM autonomous vehicle technology strategy and produce innovative AI / ML solutions for autonomous vehicle perception, planning and behavior decision making modules. Our high-level AI / ML landscape includes: Deep neural networks Agent-based modeling / Symbolic artificial intelligence Deep reinforcement learning Hybrid-systems with heuristic and AI/ML models and shared autonomy End-to-end systems Application of AI / ML for autonomous vehicle perception, planning and behavior systems

Responsibilities:

Work as an independent yet integral member of a team to develop innovative and creative AI / ML solutions for highly automated vehicles with world leading experts of autonomous vehicles. Develop and maintain high quality C/C++ and Python code under Linux for general purpose PCs and embedded hardware platforms. Test and debug software on autonomous research vehicle prototypes. Plan and execute complex and challenging technical projects. Possess strong interpersonal skills and consistently demonstrate ability to work in a team environment and with cross-functional global teams. Maintain state-of-the-art technical expertise in artificial intelligence, machine learning and software programming. Generate intellectual property.

Qualifications Required:

PhD with 2+ years or Masters with 5+ years of experience in computer science, electrical engineering, mathematics, physics. Expert-level knowledge in learning algorithms such as inverse reinforcement learning, deep reinforcement learning and probabilistic inference for decision support systems. Knowledge and hands-on expertise in deep neural network topologies such as convolutional nets, recurrent nets, RBMs, causal reasoning, probabilistic programming. Strong software development skills in C/C++ under Linux environments with a proven ability to deliver high quality software coding on time. Mathematically minded with experience in manipulating high-volume, high-dimensionality data from varying sources to highlight patterns, anomalies, relationships and trends with machine learning techniques. Develop requirements and evaluation methods for artificial intelligence technologies and benchmark vendor technologies. Experience in algorithm development, prototype system development and prototype software implementation on hardware platforms.

Preferred:

Education background in mobile robotics / autonomous vehicles with knowledge in environmental perception, 3D modelling, route planning, path planning, trajectory planning and motion planning. Experience in autonomous vehicle prototype system development, integration and testing. Modeling data abstractions employing multiple non-linear mathematical and statistical modeling approaches Hands-on development experience in one or more of the following areas: o GPU programming, NVidia CUDA o OpenCL, Matlab, Python, OpenCV o Caffe, CNTK,

TensorFlow frameworks or any symbolic AI-based high-level languages / virtual machines What Makes Us Attractive? General Motors is reinventing itself as a company. We are driving forward, accelerating change, and opening the door to new thinking and advanced technology. Our vision is to design, build and sell the worlds best vehicles. General Motors of Canada strives for an open, interactive, and dynamic work environment that promotes a rapid exchange of ideas and information. Our employees represent a true cross-section of cultures, demographics, and lifestyles, which help General Motors to succeed worldwide. General Motors of Canada is continually looking for qualified candidates who have the ideas and ambition to drive GM forward as a faster moving, more agile, highly innovative developer, manufacturer, and marketer of automotive components and vehicles. When you join one of the largest organizations in the world, you can expect a rewarding experience and benefits on a similar scale.

This includes:

Everything you need to develop your skills and realize your career goals. An environment which encourages a balance between work and personal life. A culture where collaboration and team work is fostered. A competitive total compensation package. A comprehensive benefit and retirement savings program to protect you and your family. The resources and support you need for your health and well-being. A company that is committed to supporting organizations and programs focused on safety, STEM education, community development, and environment & energy. For more information about General Motors of Canada or to search other available opportunities, please visit our website at www.gm.ca/careers. We would like to thank all candidates for expressing interest however only those selected for interviews will be contacted. Pre-employment screening will be required. Accommodation is available for applicants with disabilities. Should you be contacted by General Motors of Canada Ltd, please advise if you require accommodation. General Motors of Canada values diversity and is an equal opportunity employer.

Job Engineering Primary Location Canada-Ontario-Markham Posting Date :

Mar 23, 2017, 3:29:18 PM Apr 23, 2017, 3:59:00 AM backToTop Engineering

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom
Job Title: Artificial Intelligence/Machine Learning Engineers	

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

- Montral,QCView complete profileAdd to favorites
- Job summary
- Internal reference No.3515
- Starting date: As soon as possible
- Number of positions available: 1

- Salary:

  To be discussed
- Work schedule:
- Job status
- Work shift
- Description Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de lassurance. Notre client est situ Montral. Description des tches et responsabilits Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details Artificial Intelligence (Machine learning) Engineer

- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, APIs, Apps, NUIs et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelors Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy

AI & machine learning software products Assignment Length6 months Contract Renewable or Permanent position Start dateImmediately Reference number

BH 232775

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Job Posting Analytics

Lightcast Q3 2025 Data Set

March 2026

1455 Boulevard de Maisonneuve O

Parameters

Select Timeframe: Feb 2016 - Feb 2026

Posting Language: All Postings

Lightcast Occupations:

Results should include

Code	Description
231113	Data / Data Mining Analyst
231114	Data Scientist
231118	Analytics Manager
231120	Artificial Intelligence Engineer
231210	Data Engineer

Code	Description
231213	Database Architect
231510	Computer Systems Engineer / Architect
231514	Technology Consultant
231715	Software Developer / Engineer

Regions:

Code	Description
24	Quebec

Advertised Salary: Include all postings regardless

Minimum Experience Required: Any

Education Level: Any

Job Type: Include Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search: "Artificial Intelligence" or "AI"

Posting Type: Active Postings

Job Postings Overview

2,390	425	2 : 1
Unique Postings	**Companies Posting**	**Posting Intensity**
4,615 Total Postings	130,570 Total Companies	Regional Average: 2 : 1

Advertised Salary

There are 158 advertised salary observations (7% of the 2,390 matching postings).

$50.34/hr

Median Advertised Salary



Advertised Salary Trend

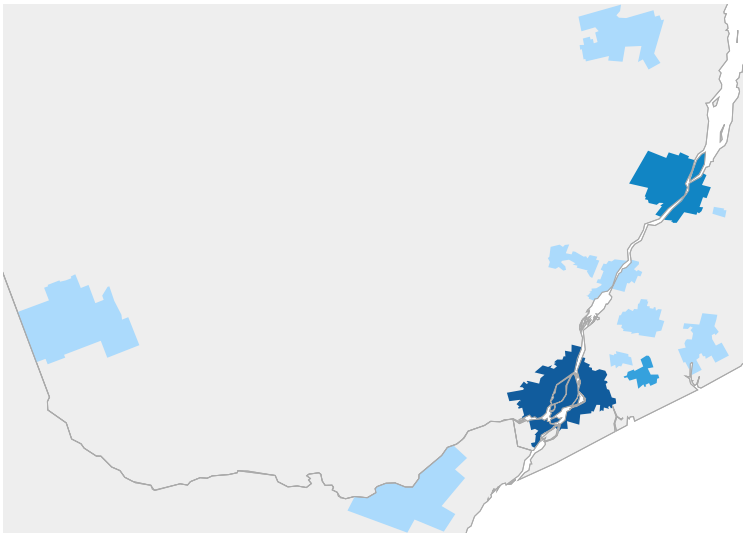
▲ 0.0% Feb 2016 – Feb 2026

$50.34 **Median**



158 Job Postings

Job Postings Regional Breakdown



CMA	Unique Postings (Feb 2016 - Feb 2026)
Montréal	1,830
Québec	331
Granby	13
Sherbrooke	7
Ottawa - Gatineau	7

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Feb 2026	243	2 : 1
Jan 2026	222	2 : 1
Dec 2025	180	2 : 1
Nov 2025	163	3 : 1
Oct 2025	180	4 : 1
Sep 2025	172	4 : 1
Aug 2025	175	4 : 1
Jul 2025	136	3 : 1
Jun 2025	120	3 : 1
May 2025	127	2 : 1
Apr 2025	106	2 : 1
Mar 2025	81	2 : 1
Feb 2025	73	2 : 1
Jan 2025	62	2 : 1
Dec 2024	61	2 : 1
Nov 2024	54	2 : 1
Oct 2024	56	2 : 1
Sep 2024	52	2 : 1
Aug 2024	69	2 : 1
Jul 2024	55	2 : 1

Jun 2024	51	2 : 1
May 2024	56	2 : 1
Apr 2024	57	2 : 1
Mar 2024	52	2 : 1
Feb 2024	59	2 : 1
Jan 2024	39	2 : 1
Dec 2023	30	2 : 1
Nov 2023	30	2 : 1
Oct 2023	24	2 : 1
Sep 2023	32	2 : 1
Aug 2023	23	2 : 1
Jul 2023	43	1 : 1
Jun 2023	45	2 : 1
May 2023	41	1 : 1
Apr 2023	38	2 : 1
Mar 2023	49	1 : 1
Feb 2023	53	1 : 1
Jan 2023	58	1 : 1
Dec 2022	49	1 : 1
Nov 2022	62	1 : 1
Oct 2022	60	2 : 1
Sep 2022	67	1 : 1
Aug 2022	62	2 : 1
Jul 2022	58	2 : 1
Jun 2022	43	2 : 1
May 2022	47	2 : 1
Apr 2022	55	2 : 1
Mar 2022	67	2 : 1
Feb 2022	73	2 : 1
Jan 2022	63	2 : 1
Dec 2021	112	2 : 1

Nov 2021	101	2 : 1
Oct 2021	51	2 : 1
Sep 2021	44	1 : 1
Aug 2021	44	1 : 1
Jul 2021	48	2 : 1
Jun 2021	42	2 : 1
May 2021	40	2 : 1
Apr 2021	44	2 : 1
Mar 2021	49	2 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	651	27%
High school or GED	19	1%
Associate's degree	16	1%
Bachelor's degree	1,293	54%
Master's degree	928	39%
Ph.D. or professional degree	488	20%

Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	19	0	1%
Associate's degree	15	0	1%
Bachelor's degree	1,264	23	53%
Master's degree	352	410	15%
Ph.D. or professional degree	89	399	4%

Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	1,143	48%
0 - 1 Years	47	2%
2 - 3 Years	374	16%
4 - 6 Years	532	22%
7 - 9 Years	189	8%
10+ Years	105	4%

Top Companies Posting

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Intact Financial Corp	180 / 142	1 : 1	
Deloitte	477 / 114	4 : 1	
Bell Canada	259 / 99	3 : 1	
National Bank of Canada	230 / 84	3 : 1	
IBM	117 / 75	2 : 1	
NTT DATA	123 / 52	2 : 1	
IQVIA	100 / 52	2 : 1	
Funded.club	71 / 49	1 : 1	
Intact	91 / 48	2 : 1	
Brainbox Ai	47 / 41	1 : 1	

Top Cities Posting

City	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Montreal, QC	3,331 / 1,580	2 : 1	
Quebec City, QC	301 / 189	2 : 1	
Québec City, QC	234 / 131	2 : 1	
Dorval, QC	152 / 67	2 : 1	
Kirkland, QC	82 / 34	2 : 1	
Montréal, QC	34 / 30	1 : 1	
Laval, QC	40 / 21	2 : 1	
Longueuil, QC	29 / 21	1 : 1	
Brossard, QC	27 / 18	2 : 1	
Bromont, QC	25 / 12	2 : 1	

Top Posted Occupations

Occupation (NOC)	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data scientists	2,215 / 1,120	2 : 1	
Software developers and programmers	1,340 / 760	2 : 1	
Database analysts and data administrators	396 / 174	2 : 1	
Computer engineers (except software engineers and designers)	205 / 109	2 : 1	
Software engineers and designers	160 / 95	2 : 1	
Information systems specialists	160 / 73	2 : 1	
Mathematicians, statisticians and actuaries	133 / 55	2 : 1	
Professional occupations in business management consulting	6 / 4	2 : 1	

Top Posted Occupations

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Software Developer / Engineer	1,500 / 855	2 : 1	
Artificial Intelligence Engineer	1,305 / 637	2 : 1	
Data Scientist	707 / 397	2 : 1	
Computer Systems Engineer / Architect	205 / 109	2 : 1	
Database Architect	203 / 95	2 : 1	
Data Engineer	203 / 86	2 : 1	
Data / Data Mining Analyst	199 / 83	2 : 1	
Technology Consultant	160 / 73	2 : 1	
Analytics Manager	133 / 55	2 : 1	

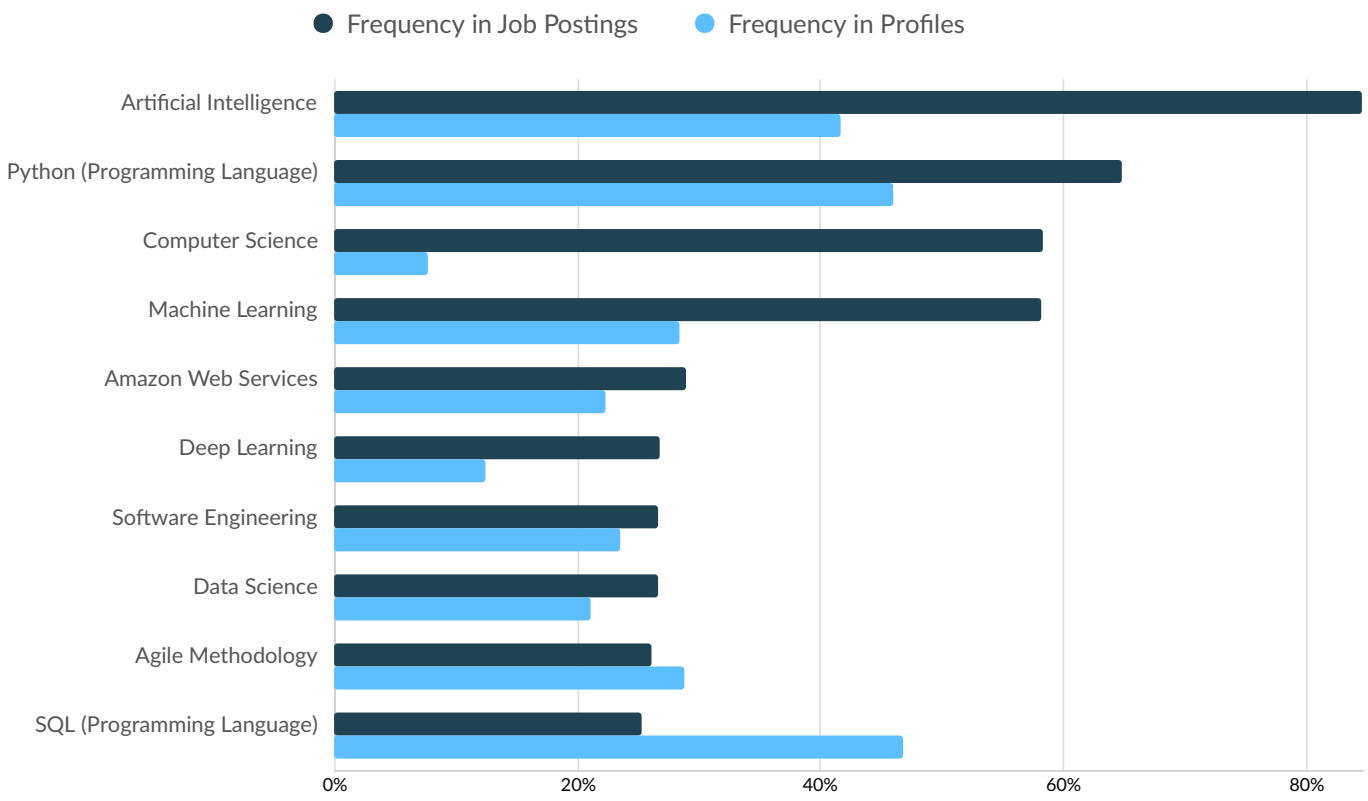
Top Posted Job Titles

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data Scientists	269 / 160	2 : 1	
Software Developers	172 / 119	1 : 1	
Full Stack Developers	168 / 74	2 : 1	
Artificial Intelligence Managers	126 / 67	2 : 1	
Machine Learning Engineers	65 / 46	1 : 1	
Directors of Artificial Intelligence	71 / 40	2 : 1	
Artificial Intelligence Architects	59 / 38	2 : 1	
Artificial Intelligence Engineers	79 / 37	2 : 1	
Artificial Intelligence Analysts	112 / 37	3 : 1	
Data Engineers	60 / 31	2 : 1	

Top Industries

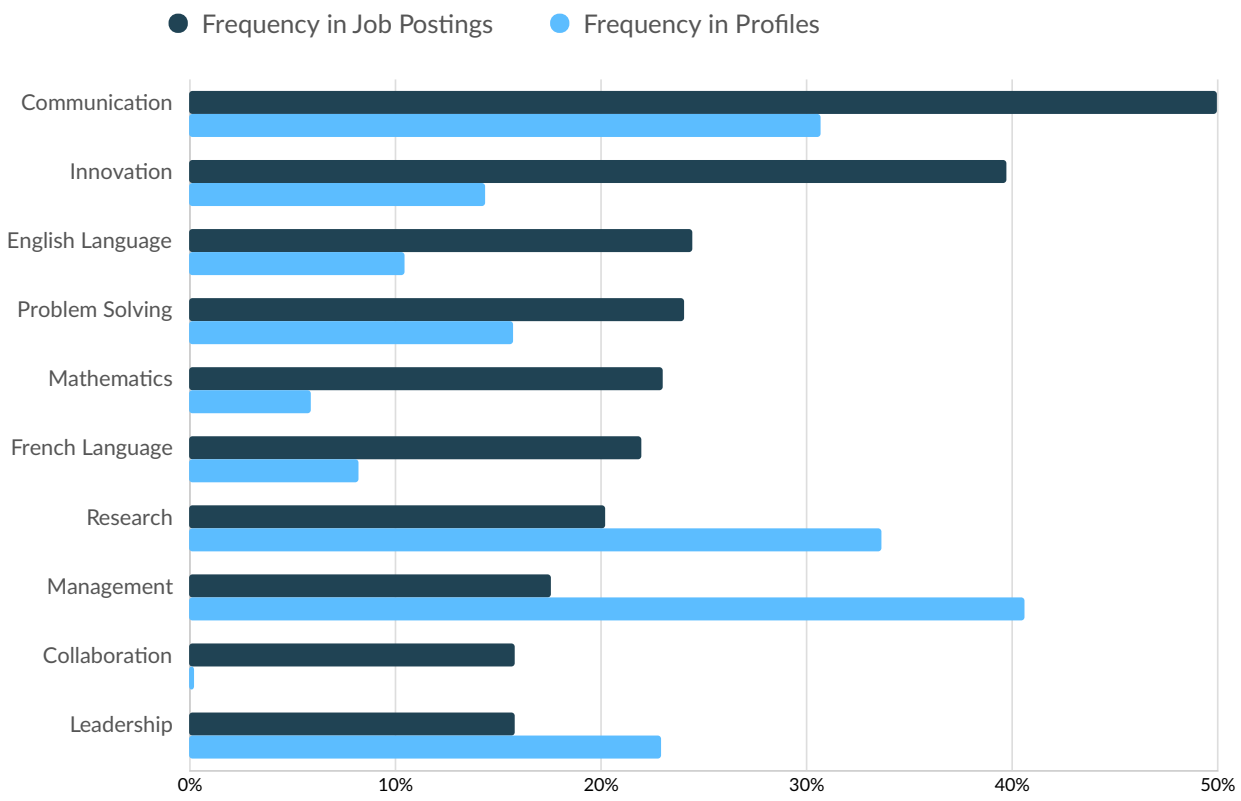
	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Direct Property and Casualty Insurance Carriers	277 / 195	1 : 1	
Commercial Banking	442 / 170	3 : 1	
Custom Computer Programming Services	279 / 158	2 : 1	
Administrative Management and General Management Consulting Services	510 / 128	4 : 1	
Software Publishers	282 / 124	2 : 1	
Offices of Certified Public Accountants	293 / 117	3 : 1	
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	134 / 77	2 : 1	
Computer Terminal and Other Computer Peripheral Equipment Manufacturing	117 / 75	2 : 1	
Temporary Help Services	63 / 48	1 : 1	
Employment Placement Agencies	72 / 44	2 : 1	

Top Specialized Skills



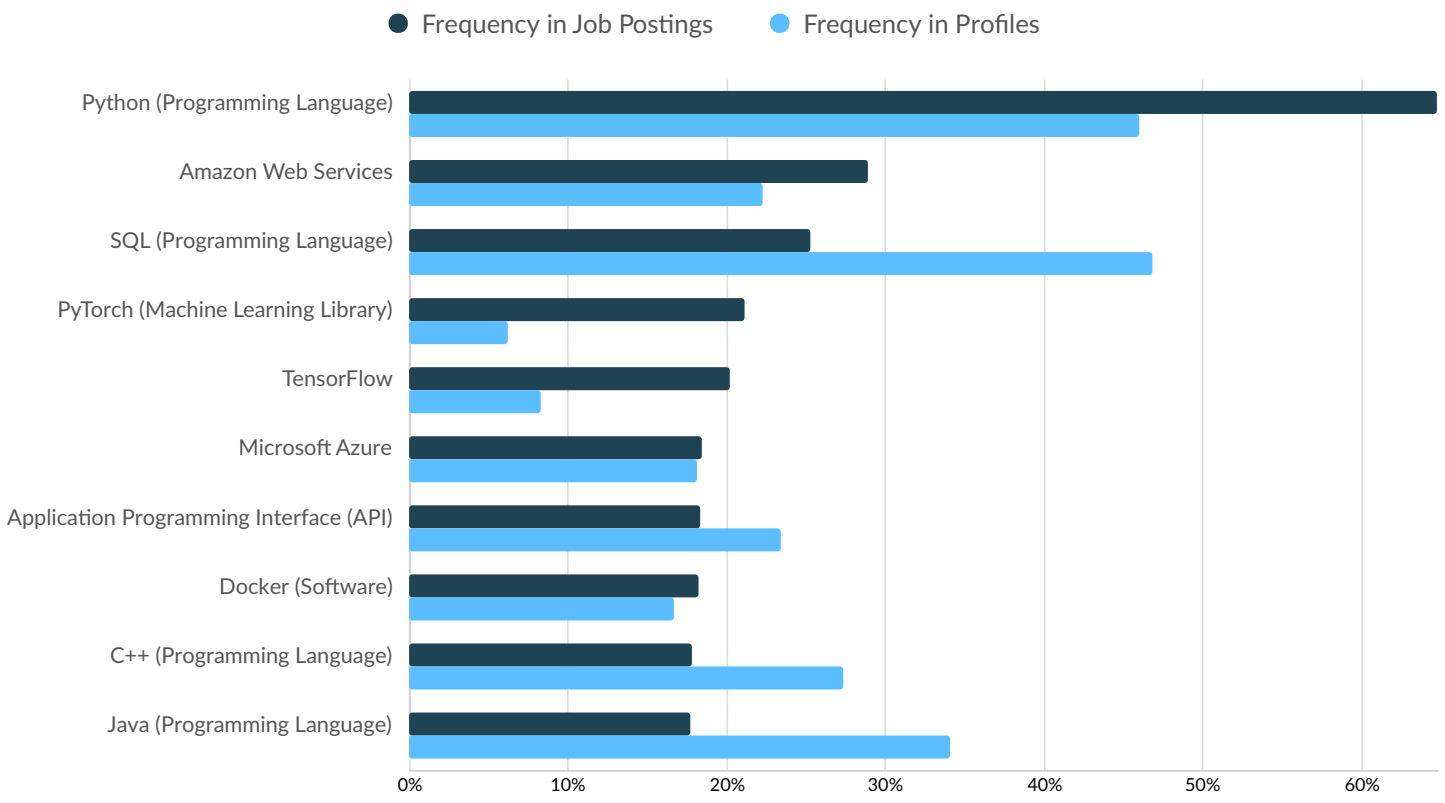
	Postings	% of Total Postings	Profiles	% of Total Profiles
Artificial Intelligence	2,022	85%	3,721	42%
Python (Programming Language)	1,549	65%	4,107	46%
Computer Science	1,394	58%	693	8%
Machine Learning	1,392	58%	2,537	28%
Amazon Web Services	691	29%	1,993	22%
Deep Learning	642	27%	1,114	12%
Software Engineering	638	27%	2,099	23%
Data Science	636	27%	1,888	21%
Agile Methodology	624	26%	2,575	29%
SQL (Programming Language)	605	25%	4,183	47%

Top Common Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Communication	1,195	50%	2,743	31%
Innovation	950	40%	1,284	14%
English Language	586	25%	934	10%
Problem Solving	575	24%	1,407	16%
Mathematics	550	23%	530	6%
French Language	526	22%	739	8%
Research	483	20%	3,007	34%
Management	420	18%	3,628	41%
Collaboration	379	16%	19	0%
Leadership	378	16%	2,053	23%

Top Software Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Python (Programming Language)	1,549	65%	4,110	46%
Amazon Web Services	691	29%	1,994	22%
SQL (Programming Language)	605	25%	4,187	47%
PyTorch (Machine Learning Library)	506	21%	554	6%
TensorFlow	484	20%	744	8%
Microsoft Azure	440	18%	1,624	18%
Application Programming Interface (API)	438	18%	2,095	23%
Docker (Software)	436	18%	1,493	17%
C++ (Programming Language)	426	18%	2,449	27%
Java (Programming Language)	424	18%	3,044	34%

Top Qualifications

	Postings with Qualification
Security Clearance	24
Master Of Business Administration (MBA)	21
Microsoft Certified Professional	20
Certified Information Systems Security Professional	15
Microsoft Azure Certification	14
AWS Certified Solutions Architect	13
AWS Certified Security Specialty	11
Valid Driver's License	11
Certified Information Security Manager	11
Secret Clearance	10

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2016 - Feb 2026)
indeed.com	339
jobs.ca	330
localwork.ca	207
workopolis.com	162
careerjet.ca	156
myworkdayjobs.com	142
dejobs.org	117
theitjob.com	102
adzuna.ca	87
tiptopjob.com	87
jobillico.com	81
jobbank.gc.ca	65
intactfc.com	58
deloitte.ca	56
intact.ca	56
bce.ca	55
fairygodboss.com	48
option-carriere.ca	45
taleo.net	44
bamboohr.com	39
greenhouse.io	35
lever.co	34
nbc.ca	34
gurulink.ca	32
careerbeacon.com	30

Appendix B

Sample Postings

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom Services
Job Title: Artificial Intelligence/Machine Learning Engineers	

1229 Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning)

Engineerhttps:

//www.careerbeacon.com/posting/632654/procom-services/ingenieur-intelligence-articifielle

- span class="jpa-keyword-highlight">artificial
- span class="jpa-keyword-highlight">intelligence-machine-learning-engineer/montreal/?sref=emptyProcom Services
- Montral, QC Ingnieur Intelligence Articifielle /

Artificial Intelligence (Machine learning) Engineer Information Technology Procom Services Montral, Quebec Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de l'assurance. Notre client est situ Montral. Description des tches et responsabilits

- Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste
- Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details

- Artificial Intelligence (Machine learning) Engineer
- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, API's, Apps, NUI's et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills
- Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelor's Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy AI & machine learning software products Assignment Length6 months Contract
- Renewable or Permanent position Start dateImmediately Reference number

BH 232775

Apply

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom
Job Title: Artificial Intelligence/Machine Learning Engineers	

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

- Montral,QCView complete profileAdd to favorites
- Job summary
- Internal reference No.3515
- Starting date: As soon as possible
- Number of positions available: 1

- Salary:

  To be discussed
- Work schedule:
- Job status
- Work shift
- Description Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de lassurance. Notre client est situ Montral. Description des tches et responsabilits Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details Artificial Intelligence (Machine learning) Engineer

- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, APIs, Apps, NUIs et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelors Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy

AI & machine learning software products Assignment Length6 months Contract Renewable or Permanent position Start dateImmediately Reference number

BH 232775

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Engineer Artificial Intelligence

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Sra Staffing
Job Title: Artificial Intelligence Engineers	

Engineer Artificial Intelligence

- Montral,QC View complete profileAdd to favorites
- Job summary
- Starting date: As soon as possible
- Number of positions available: 1

- Salary:

  To be discussed
- Work schedule:

Full time

- Job status:

Permanent

- Work shift:

Day

- Work environment
- Description As a member of the Software Engineering and R & D team, you will have great challenges to overcome and that is why we are looking for a highly motivated person who will collaborate with various groups within the organization, including software engineering, data science, industrial user experience and R & D teams.

The individual will be involved in the construction and support of the basic AI system used by the various company teams for the delivery of artificial intelligence capabilities, software and features.

Qualifications:

- 2 years and over in development / software engineering (production)
- 2 years and older with machine learning technologies (production)
- 2 years and older with artificial intelligence technologies (production)
- Bachelor's degree in computer science, software engineering or relevant experience Skills sought The qualified candidate must have
- Python programming (Pandas, SkLearn etc)
- Create and deploy software products based on AI and machine learning in production
- Support, troubleshoot and optimize software products based on AI and machine learning in production (Virtual Environment Management and Docker Containers)
- Continuous machine learning cycle
- IA technologies in the areas of time series and sensor data
- Machine Learning Technologies
- Software engineering technologies in the areas of services, APIs, applications, NUI and others
- Software engineering practices such as Agile, Devops, CI and CD and others
- Cloud technologies in the areas of IaaS, PaaS, SaaS (An asset)
- French Spoken and Written (Writing / Documentation / Technical Reports etc)

- Report writing / English documentation.
- Requirements
- Level of education undetermined
- Diploma undetermined
- Work experience (years) 3-5 years
- Written languages

Fr :

Advanced En :

Advanced

- Spoken languages

Fr :

Advanced En :

Advanced

Director, Artificial Intelligence

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Randstad
Job Title: Directors of Artificial Intelligence	

Director, Artificial Intelligence

- Montral,QC View complete profileAdd to favorites
- Job summary
- Internal reference No.s2016072
- Starting date: As soon as possible

- Salary:

  To be discussed
- Work schedule:
- -Job status:

Permanent

- Work shift
- -Work environment
- Description Randstad is partnering with a worlds leader in technology to recruit for an experienced and passionate leader for our AI research team in Montral. You bring a broad knowledge of machine learning algorithms and techniques to help create the next generation of intelligent products/services. You are excited by the opportunity to take ownership to grow a technical team and will mentor a growing team of AI researchers and foster an environment of world class research.

Responsibilities:

You will mentor and manage a growing team of AI researchers. You will foster an environment where the team members work collaboratively together and where they are empowered and challenged to create world class research. Directly influence strategic direction and make meaningful technical contributions at the global level; support R&D executives' efforts in business development and technology exploration Lead the team to develop machine learning algorithms applicable to the next generation of intelligent products/services development Build links with the local universities and tech community. As the ambassador you will create joint research initiatives with the universities and the emerging AI community in Montral. Leading, managing, and growing engineering teams.

Qualifications:

Ph.D. or Masters degree in Computer Science or Electrical Engineering (major in Machine Learning) Experience in Artificial Intelligence, Machine Learning, Natural Language Processing or other related areas 10+ publications of top conferences or journals in AI field for past 10 years Strong background in a broad spectrum of machine learning algorithm including unsupervised, supervised, and reinforcement learnings and a variant of neural network models. Knowledge of machine perception, natural language processing, speech processing, and image recognition Strong perspective on current and emerging machine learning trends Excellent communication and interpersonal skills to work effectively with other leaders in the company, such as senior executives in HQ and other sites Interested in hearing more? Please send your details to guillaume.dion@randstad.ca

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Director, Artificial Intelligence

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Randstad
Job Title: Directors of Artificial Intelligence	

Director, Artificial Intelligence

- 1751 rue Richardson, Montral,QC View complete profileAdd to favorites
- Job summary
- Internal reference No.r2016072
- Starting date: As soon as possible

- Salary:

  To be discussed
- Work schedule:
- -Job status
- -Work shift
- -Work environment
- Description Randstad is partnering with a worlds leader in technology to recruit for an experienced and passionate leader for our AI research team in Montral. You bring a broad knowledge of machine learning algorithms and techniques to help create the next generation of intelligent products/services. You are excited by the opportunity to take ownership to grow a technical team and will mentor a growing team of AI researchers and foster an environment of world class research.

Responsibilities:

You will mentor and manage a growing team of AI researchers. You will foster an environment where the team members work collaboratively together and where they are empowered and challenged to create world class research. Directly influence strategic direction and make meaningful technical contributions at the global level; support R&D executives' efforts in business development and technology exploration Lead the team to develop machine learning algorithms applicable to the next generation of intelligent products/services development Build links with the local universities and tech community. As the ambassador you will create joint research initiatives with the universities and the emerging AI community in Montral. Leading, managing, and growing engineering teams.

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- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Library Report
For the Proposed

Bachelor of Engineering in Artificial Intelligence Engineering
&
Bachelor of Science in Artificial Intelligence

Katharine Hall & Krista Alexander, Associate Librarians

April 28, 2026

Purpose

The purpose of this report is to assess the adequacy of available library resources to support the proposed Bachelor of Engineering in Artificial Intelligence Engineering, and Bachelor of Science in Artificial Intelligence at Concordia University. The report identifies resources and funding required to support the programs.

Summary

The Library can adequately support this new program within its current collections budget.

Concordia programs and comparators

Currently the Faculty offers undergraduate programs in computer science, computer engineering, software engineering and more specialized programs in cybersecurity. There is also a graduate microprogram in applied artificial intelligence. The proposed programs would be delivered through a newly formed unit, Artificial Intelligence Engineering Virtual Unit (AIE), which is a joint initiative of the Department of Electrical and Computer Engineering (ECE), the Concordia Institute for Information Systems Engineering (CIISE), and the Department of Computer Science and Software Engineering (CSSE).

The Steering Committee identified comparator programs at a variety of institutions, including Western University, University of Waterloo and Ontario Tech University. These three universities' collections will be used as comparators throughout this report.

Collections Assessment

A. Monographs

i. Current Collection Growth

For the current fiscal year, 2025/2026, the budget allocations for both CSSE and ECE are $6,300 each (n.b. CIISE is supported under the budget envelope for CSSE). For the previous four complete fiscal years, our budget allocations have been as follows:

Fiscal Year	Allocation for CSSE	Allocation for ECE
2024/2025	$7,000	$7,000
2023/2024	$11,300	$7,900
2022/2023	$12,400	$8,700
2021/2022	$13,500	$11,500

While the recent decrease in budget allocations has impacted the number of monographs that are individually selected, these departments are very well supported through the library's commitment to subscriptions and acquisitions of large ebook packages. The following are packages with relevant content for artificial intelligence:

- Knovel ebooks
- O'Reilly ebooks (formerly Safari Books Online)
- Springer ebooks subcollections:
    - Engineering
    - Computer Science
    - Intelligent Technologies and Robotics
    - Synthesis Digital Library of Engineering and Computer Science

A collection analysis was performed in 4 subject areas that fall within artificial intelligence to determine the average percent growth in area in the past three years at Concordia and the comparator institutions.

	Concordia	Western	Waterloo	OntarioTech
Annual percent growth (3-year average)	12%	9%	13%	10%

ii. Recommendation

Concordia Library has access to relevant ebook content and its annual collection growth in the areas examined is in line with the comparator institutions. The Library can adequately support this new program within its current monograph budget allocation.

B. Journals

i. Current collection

The Library has a substantial collection of electronic journals, which are usually acquired in bundles, either from the publisher or an aggregator. These subscription bundles, generally managed on a national or provincial level by the CRKN consortium of academic libraries or by the Partenariat des bibliothèques universitaires du Québec (PBUQ) in Quebec, include journals relevant to artificial intelligence. They include:

- Elsevier (ScienceDirect)
- Institute of Electrical and Electronics Engineers (IEEE)

- Sage
- Springer-Nature
- Taylor & Francis
- Wiley-Blackwell

ii. Needs assessment

A list of 20 journals in artificial intelligence was compiled and compared to Concordia's current holdings. Those titles where Concordia had no access or where there was an embargo on current access, were prioritized as either high, medium or low priorities. There was one title to which Concordia had a year-long embargo on current access. Although a high priority title, access to the most recent year's articles via interlibrary loan was viewed as being sufficient for the proposed Bachelors degree programs.

iii. Recommendation

The Library's current journal subscriptions and packages are adequate for the needs of the proposed program.

C. Databases

i. Current collection

The Library has many subscriptions to electronic full-text databases and abstract indexes. Those most relevant to artificial intelligence include:

Database name	Database content
ACM Digital Library	Contents published by ACM, covering computer science, information technology, software engineering, networking, wireless communications, and other computing-related subjects.
Compendex (on Engineering Village)	A bibliographic database covering engineering research literature since 1884.
IEEE Xplore	Contents published by IEEE, covering many fields including circuits, communication systems, computer engineering, information theory, robotics, power engineering, signal processing, telecommunications.
Inspec (on Engineering Village)	A bibliographic database covering physics, electrical engineering, electronics and computing.
Inspec Analytics	A research intelligence tool to help research professionals explore global trends in physics, engineering and technology research, released by the IET (Institute of Engineering and Technology).
O'Reilly for Higher Education	A collection of books and video, proven learning paths, case studies, interactive tutorials, reference sources, audio books relating to IT, programming and software engineering.
SPIE Digital Library	A collection of contents in optics and photonics research by the Society of Photo-Optical Instrumentation Engineers.
Web of Science	This multidisciplinary database covers the journal literature of the sciences through the Science Citation Index Expanded, which includes the fields of science and engineering.

ii. Needs assessment

A review of the databases available for Computer Science and Software Engineering at Western University, University of Waterloo and Ontario Tech University was completed. There was 1 database, McGraw-Hill's *AccessEngineering*, that is available at all 3 other institutions and not available at Concordia.

McGraw-Hill's *AccessEngineering* is a general engineering reference source that contains ebooks, handbooks, videos and a data visualization tool. While it contains content relevant to the proposed program, it is not a specialized resource for AI, computer science or software engineering. While held by all three comparator univerisities, it was not judged to be a required subscription for the proposed programs, especially given Concordia's current subscription to *O'Reilly for Higher Education*, which contains similar content.

iii. Recommendation

The Library's current database subscriptions are adequate for the needs of the proposed program.

D. Collections Recommendation Summary

The Library can adequately support this new program within its current collections budget.

Additional Library services

All university libraries in Quebec use the same shared services platform called Sofia, which allows students and faculty from all Quebec university libraries to search, access, request and borrow items from the collections of the 18 partner institutions.

The interlibrary loan service, also integrated in Sofia, provides students and faculty with the ability to request materials that are not available in the Concordia Library collection, including electronic delivery of journal articles. Students and faculty may borrow books in person at other academic libraries in Quebec using their Concordia ID card.

Academic Support

The subject librarian is available to conduct course-specific library workshops, as requested by faculty, and provides help with library research on an individual basis for all students and faculty in the department. A team of professional librarians and trained staff help Concordia students and faculty with their basic information and research questions at the Ask Us Desks, as well as via e-mail and chat.

Conclusion

A careful assessment was made of the library's current monograph, journal, and database holdings and subscriptions to determine the adequacy of available library resources to support the proposed Bachelor of Engineering in Artificial Intelligence Engineering, and Bachelor of Science in Artificial Intelligence at Concordia University. It was determined that the Library can adequately support these new programs within its current collections budget.

Appendix 6: List of external experts who provided detailed feedback in industry survey

Following a data-driven approach, we asked industry experts to complete a comprehensive survey for us, reaching out to about 100 industry experts through our faculty network. The following is the list of industry experts who supported the proposal by providing detailed feedback in the survey. Detailed survey results can be found in Appendix 3.

Name	Current job title	Organization	Sector	Core responsibilities
Zhenglin Xiong	Chief Executive Officer	AEROPORT AI	Software / ICT / AI Products and Services	Executive / Senior management, HR management, Data / AI / ML / Analytics, Product management, Operations
Mehdi Abedinpour Fallah	R&D Principal Specialist, Controls Software Engineering	Pratt & Whitney Canada	Aerospace	Engineering / Development, Research / R&D
Anders Jeppsson	Vice President, Engineering	Syntronic R&D Inc	R&D Design services	Executive / Senior management
Parul Khanna	Vice President, Cybersecurity	BNP Paribas	Finance / Insurance / Fintech	Executive / Senior management, HR management, Engineering / Development, Data / AI / ML / Analytics, Research / R&D, Operations
Tamara Vandersluis	Vice President, Innovation	R2i	Information technology - servers	Executive / Senior management, Consultant
Daniel Ratchford	Vice President and Head of Delivery	Applexus Technologies	Software / ICT / AI Products and Services	Executive / Senior management
Fiona Simpson	Chief Executive Officer	BioMimir Inc.	Medical Devices / Healthcare Technology / Hospitals	Executive / Senior management, Engineering / Development, Research / R&D, Operations
Oz Gurtuna	Founder / Chief Executive Officer	Plumfind	Software / ICT / AI Products and Services	Executive / Senior management, Data / AI / ML / Analytics
Jacques Gauthier	Vice President, Business Development	Upbrella International	Construction / Civil / Infrastructure	Executive / Senior management
Marco de Tavira	Director of Operations, PSS	Laurentide Controls	Robotics / Industrial Automation	Executive / Senior management, Engineering / Development, Operations

Jean-Francois Cantin	Transport Engineer	gbi	Automotive / Transportation / Logistics	Engineering / Development, Research / R&D
Patrick Jean-Baptiste	Security Director	Sunphinx inc.	Specialized Engineering Consulting / R&D Services	Executive / Senior management
Luca Crotti	Consultant	Alfiere Innovation	Specialized Engineering Consulting / R&D Services	Executive / Senior management
Camille Matte	Associate Manager, System Design	Zimmer Biomet	Medical Devices / Healthcare Technology / Hospitals	Engineering / Development, Research / R&D
Naysan Saran	Co-founder and Chief Executive Officer	CANN Forecast	Software / ICT / AI Products and Services	Executive / Senior management, Product management, Research / R&D
Fiona Simpson	Chief Executive Officer	BioMimir Inc.	Medical Devices / Healthcare Technology / Hospitals	Executive / Senior management, Research / R&D
Mike Lee	Chief Executive Officer	Fundica	Finance / Insurance / Fintech	Executive / Senior management
Jean-Samuel Chenard	President	Motsai	Specialized Engineering Consulting / R&D Services	Executive / Senior management

Summary and Rationale for Changes

The Gina Cody School of Engineering and Computer Science (GCS) proposes the establishment of a Bachelor's program in Artificial Intelligence. This program will be developed and jointly administered by three academic units— the Department of Electrical and Computer Engineering (ECE), the Concordia Institute for Information Systems Engineering (CIISE), and the Department of Computer Science and Software Engineering (CSSE)—which will collaborate under a newly formed virtual entity, the Artificial Intelligence Engineering Virtual Unit (AIE).

Program Rationale

The Bachelor of Science (BSc) in Artificial Intelligence (AI) at Concordia University addresses the urgent need for skilled professionals in a rapidly evolving job market. AI has become a transformative technology, significantly impacting sectors like healthcare, finance, and cybersecurity. Despite Canada's reputable AI ecosystem, a notable "skills gap" persists, with AI-related job postings rising sharply, found in approximately 6% of all Canadian listings by early 2026.

Quebec is particularly affected, with 59% of its workforce (about 2.7 million people) in AI-exposed roles. There is a growing preference among employers for specialists who can create trustworthy, ethical AI systems, leading to a "seniority bottleneck." Currently, a significant 63% of professionals in the AI-specialist category hold credentials beyond a bachelor's degree. The proposed BSc in AI will provide the rigorous training required for undergraduates to enter this elite workforce immediately.

Economically, the program offers a strong return on investment. According to the 2025 Montreal Tech Salary Guide, AI-specific roles boast high entry-level salaries, such as ML/AI Engineers earning between $85,000 and $125,000 and Data Scientists starting at $75,000. By focusing on AI, Concordia positions its graduates for lucrative careers that emphasize deep understanding of neural networks, data engineering, and intelligent systems.

Moreover, while some institutions offer AI concentrations within broader Computer Science programs, none provide a dedicated AI-first undergraduate degree. Surveys reveal a strong student inclination toward specialized pathways that align with the Montreal AI ecosystem, including hubs like Mila. By marrying advanced technical training with an emphasis on ethics, safety, and practical application, the BSc in Artificial Intelligence will equip a new generation of specialists to enhance Quebec's competitiveness in the global AI landscape.

What Distinguishes the Proposed BSc Program

Our curriculum is designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. Distinct in its broad and forward-looking curriculum, the program aims to equip students with both practical skills and a profound theoretical understanding. This comprehensive approach ensures that our graduates are not just prepared for the current job market but also equipped to adapt and lead in the dynamic field, leading to sustained growth in their careers.

Target Audience

The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng program). It targets recent secondary school graduates and CEGEP graduates with a strong foundation in STEM, and professionals from the tech industry looking to specialize in AI. It is also ideal for career changers aiming to upskill and move into tech-centric roles. Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year

for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers. This program complements the broader BEng option by providing an alternative pathway that is more focused and expedited.

The program will appeal to students looking for jobs that do not require professional engineer designations, such as AI analysts, security/network/system administrators, and specialists in cloud/database/software, among others.

As a comprehensive program covering all theoretical foundations of AI, the BSc program will also appeal to students who plan to apply for graduate schools directly after obtaining the Bachelors; In addition, the BSc program can also attract students in, e.g., Electrical Engineering, Computer Engineering, Computer Science, Cybersecurity, and Software Engineering who are interested in taking AI as a minor or double major.

The Concordia University Advantage

Concordia University possesses a robust and rapidly growing research capacity in artificial intelligence, supported by one of the largest academic communities in Canada dedicated to this field. A significant proportion of these researchers are engaged in applied AI, addressing real-world challenges across diverse sectors. Many are also affiliated with the Concordia Applied AI Institute, further strengthening the university's leadership and impact in applied artificial intelligence research.

Implementation and Financial Viability

Slated for launch in September 2028, the program is expected to attract a sustained and robust pool of applicants, supported by strong long-term industry growth projections. The majority of the resources required to implement the program are already in place within GCS and across the three participating departments (CIISE, CSSE, and ECE). Collectively, these units include 129 professors with recognized expertise in artificial intelligence, actively engaged in both teaching and research across multiple AI domains.

The program can be delivered without the need for additional tenure-track faculty positions or new laboratory infrastructure. Financially, it is projected to generate a surplus for the University starting in its inaugural year, thereby ensuring long-term sustainability while contributing positively to Concordia's academic standing.

The proposed program is strongly aligned with public safety priorities and prevailing industry trends, responding to the critical demand for highly qualified AI professionals capable of enhancing organizational productivity and competitiveness.

Note: In the original proposal submitted to the Provost for support (before approval by curriculum committees), attached as a supporting document, the preliminary list of courses included AI 330 Reinforcement Learning and AI 335 Machine Learning; these course codes reflect the preliminary course lists at the time the original proposals were submitted. After further development of the program, the final course codes were as presented in the final Ministry proposal and new course forms (AI 330 Machine Learning and AI 335 Reinforcement Learning).

Resource Implications

New Undergraduate Program (Regular Process) - GCS-GCS-6046 - VERSION : 3

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Mar 2026

The dossier was approved by GCS Council with no modifications requested.

GCS Council document number: ECFC 2026.03.01.

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Mar 2026

Approved by:

Otmane Ait Mohamed, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 12 Mar 2026

New Program Proposal: B.Sc. in Artificial Intelligence

1. EXECUTIVE SUMMARY 2
2. PROGRAM IDENTIFICATION 5
   - 2.1 Degree awarded: 5
   - 2.2 Discipline: 5
   - 2.3 Program Title: 5
   - 2.4 Administrative location: 5
3. FIELD OF STUDY AND RELEVANCE 5
   - 3.1 Field of study 5
   - 3.2 Areas(s) of expertise 6
4. PROGRAM RATIONALE 7
   - 4.1 Socio-economic and socio-cultural opportunities 7
   - 4.2 Systemic Relevance and Opportunity 23
   - 4.3 Institutional Relevance and Opportunity 28
5. PROGRAM OBJECTIVES 30
   - 5.1 Output Profile 30
   - 5.2 General and specific program objectives 31
6. REGULATORY FRAMEWORK 31
   - 6.1 Admission Requirements and Processes 31
   - 6.2 Commitment and structure of the program 32
   - 6.3 Program oversight 33
7. PROGRAM STRUCTURE 35
   - 7.1 Activities 35
   - 7.2 Pedagogical approaches 37
   - 7.3 Typical student path 39
   - 7.4 Feedback and evaluation 41
   - 7.5 Alignment of activities, skills and program objectives 42
8. SUPPORT FOR STUDENT SUCCESS 49
   - 8.1 Financial support 49
   - 8.2 Student Services 50
   - 8.3 Academic and student life 51
9. RESOURCES 53
   - 9.1 Faculty Resources 54
   - 9.2 Administrative and support staff 61
   - 9.3 Material, technological and library resources 62

APPENDICES 65

1. EXECUTIVE SUMMARY

The Gina Cody School of Engineering and Computer Science (GCS) proposes the establishment of a Bachelor's program in Artificial Intelligence. This program will be developed and jointly administered by three academic units— the Department of Electrical and Computer Engineering (ECE), the Concordia Institute for Information Systems Engineering (CIISE), and the Department of Computer Science and Software Engineering (CSSE)—which will collaborate under a newly formed virtual entity, the Artificial Intelligence Engineering Virtual Unit (AIE).

Why a Cross-Departmental Program?

Artificial Intelligence is a multidisciplinary field requiring expertise in algorithms, data science, systems engineering, cybersecurity and software development. By pooling the strengths of ECE, CIISE, and CSSE, this program ensures a comprehensive and well-balanced curriculum that spans hardware, software, and systems perspectives. The cross-departmental governance model enables efficient sharing of resources, avoids duplication of efforts, and facilitates the creation of a cohesive program that leverages the unique expertise of each department. This collaborative approach strengthens GCS's ability to prepare graduates who are industry-ready and able to contribute to the rapidly evolving AI ecosystem.

Governance Structure

To ensure effective coordination, quality assurance, and alignment with the academic mission of GCS, the AIE will operate under the following governance framework:

1. **Steering Committee:** The Department Chairs of each of the three participating departments: ECE, CIISE, CSSE and the Dean or delegate.

   Responsibilities:
   - Provide strategic directions and oversee the operations of the unit
   - Oversee resource allocation and departments contributions
   - Ensure alignment with the mission and policies of GCS and Concordia University
   - Review and assess programs performance in terms of enrollment, student success, graduation, and accreditation requirements

2. **Program Director:** Rotating two-year term among the three departments, appointed by the Steering Committee.

   Responsibilities:
   - Day-to-day administration of the program
   - Liaison between students, faculty, and the Steering Committee
   - Coordination of course assignment, oversee advising, and reporting
   - Preparation of accreditation and quality assurance documentation

3. **Curriculum Committee:** Two faculty representatives from each participating department (ECE, CIISE, and CSSE), appointed by their respective Department Chairs, a student representative, and a part-time faculty representative. The Program Director chairs the Committee.

   Responsibilities:
   - Academic oversight of the AI program structure and content
   - Reviewing and recommending curriculum changes, new course proposals, and program revisions
   - Ensuring coherence, academic rigor, and alignment with accreditation standards

- Monitoring course sequencing, prerequisites, and learning outcomes
- Coordinating and consulting on curriculum changes with the relevant department(s)
- Overseeing the continuous improvement process

4. **Industrial Advisory Board:** Composition: Representatives from industry and alumni.

   Role:
   - Provide guidance and advise on curriculum matters
   - Advise on AI emerging trends and strategic priorities
   - Ensure the alignment of the program with industry needs
   - Advise on opportunities for experiential learning and partnership

Expected Outcomes

Graduates of the Bachelor's program in Artificial Intelligence will acquire a strong foundation in machine learning, data analytics, intelligent systems design, and ethical considerations in AI deployment. The program will emphasize both theoretical understanding and practical application, producing practitioners who are able to develop and implement AI algorithms and systems across diverse domains; integrate hardware and software solutions for real-world AI applications; address issues of safety, security, fairness, and explainability in AI systems; collaborate effectively in multidisciplinary teams and communicate technical solutions to a variety of stakeholders; and adapt to rapidly evolving technologies and contribute to innovation in the AI industry.

The program is expected to significantly enhance Concordia's reputation as a leader in AI education by offering one of the few dedicated undergraduate AI programs in Canada. It will also contribute to the growing demand for AI talent across industries, supporting Montreal's position as a global hub for AI research and development.

Program Rationale

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The proposed program is strongly aligned with public safety priorities and prevailing industry trends, responding to the critical demand for highly qualified AI professionals capable of enhancing organizational productivity and competitiveness.

2. PROGRAM IDENTIFICATION

2.1 Degree awarded:
Bachelor of Science (B.Sc.)

2.2 Discipline:
Artificial Intelligence

2.3 Program Title:
Bachelor of Science in Artificial Intelligence

2.4 Administrative location:
Institution: Concordia University
Faculty: Gina Cody School of Engineering and Computer Science
Department: Artificial Intelligence Engineering Virtual Unit (AIE)
Location: 1455 Maisonneuve Blvd. West, Montréal, Québec, H3G 1M8

3. FIELD OF STUDY AND RELEVANCE

3.1 Field of study
Artificial Intelligence (AI) is a multidisciplinary science and engineering discipline that applies principles from computer engineering, computer science, mathematics, and cognitive sciences to design intelligent systems capable of perception, reasoning, learning, and autonomous decision-making. AI systems underpin modern technologies such as machine learning, deep neural networks, computer vision, natural language processing, robotics, and intelligent cyber-physical systems. Over the past decade, AI has evolved at an unprecedented pace and has become a foundational technology driving innovation across virtually all sectors of society.

AI now plays a critical role in healthcare, transportation, manufacturing, telecommunications, finance, energy systems, and public services. Its rapid adoption has positioned AI as one of the fastest-growing global industries, with profound implications for economic competitiveness, national security, and public safety. As AI systems increasingly operate in safety-critical and mission-critical contexts, there is a growing demand for engineers who possess not only strong technical expertise but also a deep understanding of system reliability, robustness, and ethical deployment.

AI is among the fastest-growing academic and professional fields in Canadian higher education. While many Canadian universities offer AI-related courses or specializations embedded within computer science programs, only a limited number provide a comprehensive, standalone undergraduate degree in AI. This gap highlights a clear and urgent need for a dedicated undergraduate program in Artificial Intelligence that offers depth, coherence, and strong computing foundations.

Concordia University is well positioned to address this need, building on its recognized strengths in AI research and undergraduate education across engineering and computing disciplines. The proposed undergraduate AI program expands Concordia's portfolio of core engineering and computer science disciplines and aligns closely with the University's strategic priorities in digital transformation, innovation, and societal impact. This initiative will further distinguish Concordia nationally and enhance its academic and research leadership in artificial intelligence.

The creation of the proposed program is motivated by:

- The rapid integration of AI into critical systems and the resulting need for professionals capable of designing reliable, explainable, and safe AI solutions.
- The growing responsibility of governments and industries to deploy AI systems that enhance productivity and competitiveness while managing risks related to bias, safety, security, and ethics.
- The fast-evolving nature of AI technologies, which requires continuously updated expertise and a strong theoretical AI foundation.

- The maturity of the AI body of knowledge and the essential need to train highly qualified professionals who can design, implement, validate, and maintain AI-driven systems.

The primary academic objective of the program is to prepare students for professional careers in artificial intelligence through rigorous training in foundational theories, algorithms, and state-of-the-art technologies. Graduates will be equipped to design and deploy AI solutions across key sectors such as healthcare, transportation, manufacturing, telecommunications, and public services. In addition, the program emphasizes analytical thinking and research skills, enabling students to engage in applied research and critically assess the impact of AI systems in real-world contexts.

3.2 Areas(s) of expertise

The proposed program consists of 90 credits. The curriculum is designed to integrate theoretical foundations with practical applications, preparing graduates to address the technical, operational, and societal challenges associated with AI systems. A range of pedagogical approaches—including laboratory-based instruction, project-based learning, blended delivery, and work-integrated learning—will be employed to enhance student engagement and professional readiness. These approaches support the program's dual emphasis on core AI principles and contemporary industry practices.

Comprehensive and Multidisciplinary Curriculum

The proposed program offers a comprehensive and multidisciplinary curriculum that integrates core computer science and computing and software concepts with advanced AI knowledge. Students will develop strong foundations in mathematics, probability, optimization, algorithms, and data structures, alongside specialized training in machine learning, deep learning, computer vision, natural language processing, and reinforcement learning. The curriculum is further enriched by electives in emerging areas such as trustworthy and explainable AI, AI for cyber-physical systems, autonomous systems, and AI for smart infrastructures. This broad-spectrum approach equips graduates with the skills required to engineer robust, scalable, and responsible AI solutions.

Work-Integrated Learning Across the Curriculum

A defining feature of the program is the integration of AI-related content throughout the entire curriculum, rather than limiting it to upper-year specialization. This structure enables students to progressively build expertise and participate in multiple AI-focused co-op internships. The program is supported by Concordia's Institute for Cooperative Education and leverages strong research and industry connections across engineering and computing. Students will gain meaningful professional experience in industrial and applied research environments under joint supervision by industry mentors and faculty members, significantly enhancing employability.

Industry and Government Collaboration

The curriculum will be strengthened through strategic collaborations with industry leaders and government agencies, as evidenced by strong interest expressed in stakeholder consultations. Course projects and applied research initiatives will be supported by partners in sectors such as aerospace, manufacturing, telecommunications, healthcare, and public services. In addition, advisory input from industry and government stakeholders will provide continuous feedback, ensuring that the program remains aligned with evolving workforce needs, regulatory frameworks, and technological advancements.

Concordia University's strong academic and research foundations in artificial intelligence offer a compelling value proposition for both domestic and international students.

4. PROGRAM RATIONALE

4.1 Socio-economic and socio-cultural opportunities

4.1.1. Economic, social, and cultural needs

The growing deployment of AI in Canada's public sector underscores both the economic and social importance of developing AI expertise. Statistics Canada, for instance, is integrating AI and machine learning across its operations, from agricultural yield prediction and greenhouse mapping using satellite imagery to automated classification in the Canadian Coroner and Medical Examiner Database and an AI-enabled chatbot for the 2026 Census. These initiatives aim to improve efficiency, reduce response burden on farmers, and detect emerging public health threats, while operating under stringent requirements for privacy, confidentiality, and ethical use of data.[1]

Recent national data also confirm the rapid and broadening adoption of AI across Canadian industry. According to Statistics Canada's Canadian Survey on Business Conditions, the share of businesses using AI to produce goods or deliver services doubled from 6.1% to 12.2% between the second quarters of 2024 and 2025, and 14.5% now plan to adopt AI in the next 12 months, up from 10.6% a year earlier. Adoption is especially strong in information and cultural industries (35.6% current use; 38.6% planning to adopt), finance and insurance (30.6% use; 31.5% planning), and professional, scientific and technical services (31.7% use; 26.3% planning), with notable growth in health care and social assistance (expected use rising from 11.4% to 23.2% in one year). These are precisely the sectors that shape Canada's cultural landscape, financial stability, and public wellbeing, and they increasingly require engineers who can design, implement, and govern AI systems.[2]

The Canadian Survey on Business Conditions also indicates that AI adoption will be widespread across firms of all sizes. While 14.5% of all businesses plan to use AI over the next 12 months, this rises to 20.5% among firms with 100 or more employees, with broadly similar application profiles across large and small enterprises (data analytics, text analytics, and virtual agents or chatbots). Among businesses planning to adopt AI, the most common operational response is to train existing employees: about half (49.8%) report plans to provide AI training to staff, alongside developing new workflows, investing in cloud services, and changing data-management practices. Although hiring new AI-trained staff is still relatively uncommon (12.6%), suggesting that many firms currently attempt to meet AI-related skills needs through internal upskilling rather than recruitment, a BSc in Artificial Intelligence will expand the pool of graduates with advanced technical and applied competencies, enabling Canadian employers to complement internal training strategies with the recruitment of engineers who can lead AI integration, systems design, and governance.

The importance of AI to Canada's economic and innovation agenda is reflected in major federal investments under the Pan-Canadian Artificial Intelligence Strategy and related research programs. Phase I of the Strategy (2017–2022) invested $125 million, led by CIFAR in partnership with the national AI institutes Amii (Edmonton), Mila (Montréal) and the Vector Institute (Toronto and Waterloo), to build Canada's AI research and talent base through initiatives such as the Canada CIFAR AI Chairs program. Phase II (2021–2031) adds $443.8 million to drive AI adoption and use, including support for commercialization in key industries, AI-related standards through the Standards Council of Canada, and advanced computing capacity via the Digital Research Alliance of Canada. Complementing this, the Canada First Research Excellence Fund (CFREF) enables postsecondary institutions to build globally leading research programs in areas that create durable economic advantages for Canada, such as IVADO's "robust, reasoned and responsible AI (R3AI)" project, while the federal granting agencies (CIHR, NSERC and SSHRC) collectively invested nearly $200 million in 2021–22 alone in AI-related research and training. Recent budgets further commit over $2 billion to AI compute infrastructure, targeted funding to boost AI start-ups and help SMEs deploy AI, supports for workers impacted by AI, and the creation of a Canadian AI Safety Institute, alongside emerging initiatives such as the Canadian Sovereign AI Compute Strategy. Together, these sustained investments demonstrate that AI is a long-term national priority. A dedicated BSc in

[1] Statistics Canada, "Artificial intelligence at Statistics Canada," 2025, https://www.statcan.gc.ca/en/trust/collecting-your-data/artificial-intelligence

[2] Statistics Canada, Artificial intelligence use by businesses in Canada, second quarter 2025, Canadian Survey on Business Conditions, 2025, https://www150.statcan.gc.ca/n1/pub/11-621-m/11-621-m2025011-eng.htm

Artificial Intelligence will directly support these efforts by supplying highly qualified AI specialists who can leverage Canada's AI research infrastructure, advance commercialization and responsible adoption across sectors, and translate cutting-edge AI research into practical, standards-aligned solutions for the Canadian economy and society.[3]

Beyond aggregate adoption and investment trends, early evidence on employment impacts highlights important social considerations. A recent Statistics Canada analysis of Canadian employment trends in the era of generative AI finds no clear evidence, three years after the mass availability of tools such as ChatGPT, of widespread AI-induced job loss or disproportionate declines in occupations more exposed to AI compared with others; overall employment has continued to grow, and the pace of occupational change is comparable to previous waves of technological adoption (e.g., computers, the Internet). At the same time, the study identifies distributional effects—such as weaker job growth for younger and less-educated workers—and emphasizes substantial uncertainty as AI diffusion is still in its early stages and interacts with other shocks (pandemic recovery, immigration, trade). These findings underscore a social need for education programs that both expand access to high-quality AI-related jobs and prepare AI specialists to design and govern AI systems with attention to fairness, inclusion, and long-term labour-market impacts.[4]

4.1.2. Evolution of the AI field in Quebec

The field of Artificial Intelligence (AI) in Quebec has developed rapidly over the past decade, positioning the province—and especially Montréal—as a globally recognized AI hub. Building on the national policy and investment framework outlined in Section 4.1.1, Quebec has leveraged its strong research base, favourable innovation policies, and dynamic technology ecosystem to anchor AI at the centre of its economic and digital strategy. This evolution is reflected in targeted government initiatives, world-class academic and research institutions—particularly Mila, the Quebec AI Institute—and a dense network of firms and clusters that are accelerating AI adoption across key sectors of the provincial economy.

Government initiatives and policies

Quebec's government has made AI a cornerstone of its broader innovation and digital-transformation agenda. Successive research and innovation strategies, notably the 2017–2022 Québec Research and Innovation Strategy[5] and the 2022–2027 Québec Research and Innovation Investment Strategy (SQRI²)[6], explicitly identify AI, data science, and advanced digital technologies as priority domains for investment, talent attraction, and economic diversification. SQRI² alone provides more than $7.5 billion over five years across five axes—excelling in research; creating an innovation-friendly environment; supporting business investment and commercialization; developing talent and an innovation culture; and focusing on promising sectors and catalyst projects—in which AI and digital technologies play a central, cross-cutting role.

To translate this vision into practice, the province relies on a dense network of intermediaries and funding programs. Through organizations such as Investissement Québec and the ministère de l'Économie, de l'Innovation et de l'Énergie (MEIE), Quebec co-finances AI institutes and industrial projects, supports AI-intensive SMEs and start-ups, and helps attract major international AI labs. Sector-based industrial research clusters (Regroupements sectoriels de recherche industrielle, RSRIs)—including Prompt for information, communications and digital technologies—act as designated intermediaries for collaborative AI and ICT R&D, linking firms and academic partners and de-risking projects from lab to market. Programs such as NovaScience (scientific culture and innovation), MEIE's Collaborative Industrial Research and Support to Innovative Entrepreneurship, and dedicated PROMPT–AI funding streams provide grants for AI research,

[3] Innovation, Science and Economic Development Canada, Artificial intelligence ecosystem in Canada, Government of Canada, 2026, https://ised-isde.canada.ca/site/ised/en/artificial-intelligence-ecosystem

[4] Statistics Canada, "Canadian employment trends in the era of generative artificial intelligence: Early evidence," Economic and Social Reports, 2026, https://www150.statcan.gc.ca/n1/pub/36-28-0001/2026001/article/00003-eng.htm

[5] Gouvernement du Québec. (2017). Québec research and innovation strategy 2017–2022. https://msss.gouv.qc.ca/professionnels/documents/bureau-innovation-sante-et-services-sociaux/strategie-quebecoise-sciences-vie_2017-2027.pdf

[6] Gouvernement du Québec. (n.d.). 2022–2027 Québec strategy to support research and investment in innovation. https://www.quebec.ca/en/gouvernement/ministeres-organismes/economie/publications/2022-2027-quebec-strategy-to-support-research-and-investment-in-innovation

pilots, and commercialization, particularly in manufacturing, information and cultural industries, and professional, scientific and technical services.

Quebec has also adopted a dedicated Strategy for Integrating Artificial Intelligence into Public Administration (2021)[7], recognizing both the efficiency gains and the ethical, legal, and governance challenges of AI in public services. The Directorate for Ethical Oversight of Artificial Intelligence (DEEIA) oversees this strategy and ensures that AI integration in public bodies is grounded in responsible practices. Its mandate includes developing guidelines and rules for ethical AI use, preparing roadmaps for responsible AI deployment by state mission, evaluating and monitoring AI adoption in public bodies, and developing and enforcing risk-management and compliance frameworks.

Quebec's AI trajectory is further reinforced by its alignment with federal initiatives. Since 2017, Mila – Quebec Artificial Intelligence Institute, together with its sister institutes Amii (Alberta) and Vector (Ontario), has been a pillar of the Pan-Canadian AI Strategy led by CIFAR. In parallel, SCALE AI, Canada's AI Global Innovation Cluster focused on AI-enabled value chains, is headquartered in Montreal as one of five national Global Innovation Clusters. As a business-led consortium, SCALE AI co-invests with government to integrate AI into value chains in sectors such as consumer goods, manufacturing, logistics, infrastructure, and intra-hospital logistics, while also funding upskilling and academic training initiatives. These provincial and federal mechanisms jointly create a highly supportive policy environment for AI research, deployment, and talent development in Quebec.

Education and research

Quebec's rise as an AI leader is rooted in a dense academic ecosystem that spans computer science, engineering, mathematics, and the social sciences.

At its core is **Mila – Quebec Artificial Intelligence Institute**, founded in 1993 by Professor Yoshua Bengio at Université de Montréal. Originally created as a research lab to build a community of high-calibre AI researchers sharing a common ethical vision, Mila has since become the world's largest academic research centre for deep learning. The institute is recognized internationally for major contributions in language modeling, machine translation, object recognition, and generative models, and today hosts the world's largest concentration of deep learning academic researchers.

Mila is the result of a unique collaboration between Université de Montréal and McGill University, working closely with Polytechnique Montréal and HEC Montréal, and also hosting professors from Université Laval, Université de Sherbrooke, École de technologie supérieure, and Concordia University. In total, it brings together more than 1,400 individuals, including professors, student researchers, interns, and professional staff. Mila's research is explicitly oriented toward societal impact, with core focus areas in health, environment and climate change, and AI ethics, and is conducted using an open-science approach that promotes collaboration and knowledge transfer. In 2022–2023 alone, nearly 120 industry partners—including close to 40 start-ups—were engaged with the institute, more than 30 start-ups held official "Mila Startup" status, over 600 research projects involved Mila-affiliated faculty members, close to 300 scientific publications were produced, and 905 students, interns, and research assistants received training at Mila. Since becoming a non-profit organization in 2018 and inaugurating its Mile-Ex premises in 2019, Mila has anchored a vibrant AI innovation district in Montreal.[8]

Complementing Mila, **IVADO (Institut de valorisation des données)** serves as an interdisciplinary and intersectoral research, training, and knowledge-mobilization consortium whose mission is to build and promote robust, reasoning, and responsible artificial intelligence. Led by Université de Montréal with four core university partners—Polytechnique Montréal, HEC Montréal, Université Laval, and McGill University—IVADO brings together research centres, government, and industry partners to co-create intersectoral initiatives that foster a paradigm shift in AI and its adoption. Guided by values of excellence, collaboration, and responsible, accessible impact, IVADO's vision is to accelerate Quebec's digital transformation by catalyzing research progress around big-data exploitation. Since 2016, IVADO has invested about $42

[7] Gouvernement du Québec. (n.d.). Support and guidance for public bodies in artificial intelligence. https://www.quebec.ca/gouvernement/services-organisations-publiques/services-transformation-numerique/accompagnement-des-organismes-publics/accompagner-les-organismes-publics-en-intelligence-artificielle

[8] Mila – Quebec Artificial Intelligence Institute. (n.d.). About Mila. https://mila.quebec/en/about/about-mila

million in AI research through scholarships and grants, including $6 million dedicated to five major scientific challenges, and awarded roughly 570 scholarships. Its R3AI (robust, reasoning, and responsible AI) program, funded through the Canada First Research Excellence Fund, supports a set of Strategic Research Clusters—ten intersectoral clusters that coordinate scientific programming to realize the R3AI vision. IVADO's community comprises nearly 1,500 scientists across AI, life sciences, natural sciences, and social sciences, as well as 14 academic members and more than twenty partners, positioning Quebec as a leader in trustworthy, societally oriented AI.[9]

Concordia University, through the Gina Cody School of Engineering and Computer Science and its Applied AI Institute, plays a complementary and increasingly significant role in advancing AI in Quebec. Concordia's AI activities emphasize applied and interdisciplinary research in areas such as intelligent and cyber-physical systems, smart cities, human-centred and trustworthy AI, cybersecurity, and AI-enabled software and infrastructure. The university participates in Mila's extended network and in provincial and federal AI initiatives, and hosts AI-related research chairs and large-scale projects that link AI to critical infrastructure, transportation, and security. Concordia's programs and labs are tightly connected to industry partners and government agencies, making it a key contributor to deployable, real-world AI solutions.[10]

On the applied industrial side, **SCALE AI**—headquartered in Montreal—acts as Canada's AI Global Innovation Cluster focused on AI-powered value chains. It co-funds collaborative projects between companies and research institutions, including Quebec universities, to integrate AI into supply chains in consumer goods, manufacturing, logistics, infrastructure, and intra-hospital logistics. SCALE AI also invests heavily in talent development through professional upskilling and academic training, with a particular emphasis on addressing digital-literacy gaps, filling tens of thousands of skilled supply-chain positions, and increasing participation of underrepresented groups in AI.[11]

Quebec universities more broadly—Université de Montréal, Polytechnique Montréal, McGill University, Concordia University, ÉTS, Université Laval, Université de Sherbrooke, and HEC Montréal—have expanded AI-related educational offerings at all levels, from undergraduate options and professional master's to research-intensive graduate programs and micro-credentials. Many of these programs are directly connected to Mila, IVADO, SCALE AI, and institutional AI centres, giving students access to cutting-edge research and applied projects.

In parallel, Quebec has developed significant expertise in the societal, legal, and ethical dimensions of AI. **The International Observatory on the Societal Impacts of AI and Digital Technology (Obvia)**, created in 2019 by the Fonds de recherche du Québec and led by Université Laval, conducts independent, interdisciplinary research that places humans at the heart of technological development. Bringing together 23 post-secondary institutions, more than 290 researcher members, over 100 partners, and seven research areas, Obvia has invested roughly $7 million in research, funded 56 research teams, and supported more than 50 students through scholarships. It provides an open space for reflection and democratic deliberation, helping to maximize positive impacts and minimize negative effects of AI and digital technologies on society. Alongside legal and policy scholars at Université de Montréal, McGill, Université Laval, Concordia, and other institutions, Obvia reinforces Quebec's leadership in responsible, human-centred AI.[12]

Industry growth and demand

Quebec's AI industry has expanded rapidly, leveraging the province's research strengths, favourable business climate, and international reputation. Montreal is frequently cited as one of the top global AI hubs, with a high concentration of AI researchers, graduate students, and start-ups relative to its size. The presence of Mila and IVADO, the applied-research orientation of institutions such as Concordia, and the industrial deployment focus of SCALE AI have been powerful attractors for domestic and foreign investment, as well as for highly qualified talent.

[9] IVADO. (n.d.). Institut de valorisation des données. https://ivado.ca/en

[10] Concordia University. (n.d.). Applied AI Institute. https://www.concordia.ca/research/applied-ai-institute.html

[11] SCALE AI. (n.d.). HEC Montréal – École des dirigeants. https://www.scaleai.ca/organisation/hec-montreal-ecole-des-dirigeants/#:~:text=What%20is%20a%20Global%20Innovation,focused%20solely%20on%20AI%20projects.

[12] International Observatory on the Societal Impacts of Artificial Intelligence and Digital Technology. (n.d.). About. https://www.obvia.ca/a-propos

The province now hosts hundreds of companies whose core activities rely on machine learning and data-driven products, alongside a much larger number of firms progressively integrating AI into existing operations. These companies span finance and insurance, video games and interactive media, language technologies, health and med-tech, manufacturing and robotics, logistics and transportation, and creative industries. Major international technology firms such as Google, Meta, Microsoft, Samsung, Thales, and Ubisoft have established research or engineering teams in Montreal, often in collaboration with local universities and institutes. At the same time, numerous Quebec-based start-ups and SMEs emerge from the ecosystems of Mila, IVADO, SCALE AI, and university incubators such as Centech and District 3, contributing to a dynamic entrepreneurial environment in which AI-driven innovation is central to business models.

Labour-market evidence consistently points to sustained and diversified demand for AI skills across Quebec. Economic-development agencies and sectoral observatories highlight shortages of qualified professionals in roles such as machine-learning engineer, data scientist, MLOps engineer, AI software developer, and AI product engineer. This demand extends beyond “pure tech” firms to traditional industries—finance (e.g., Desjardins, National Bank), insurance, transportation and logistics, energy, and health care—that are increasingly deploying AI for applications such as risk scoring, fraud detection, predictive maintenance, demand forecasting, and clinical decision support. As organizations move from proofs of concept to production-grade, mission-critical AI systems, they require professionals who combine advanced AI knowledge with robust engineering practices: software architecture, real-time and distributed systems, cybersecurity, validation and verification, risk management, and human-in-the-loop design.

Existing AI training pathways in Quebec are strong but fragmented: computer-science and data-science programs provide solid foundations in algorithms and modeling; specialized graduate programs and research labs produce high-end researchers; and professional programs support upskilling for working professionals. However, there is still a limited supply of graduates who are simultaneously trained as engineers and as AI specialists, able to design, implement, and govern end-to-end AI systems that must meet safety, reliability, regulatory, and ethical requirements in demanding application domains.

4.1.3. Justification of the proposed program

The establishment of a **Bachelor of Science in Artificial Intelligence** (BSc in AI) in Quebec is strongly justified by several converging socio-economic, policy, and labor market trends. Nationally, AI has evolved from being an experimental technology to becoming critical infrastructure. For instance, Statistics Canada has started incorporating AI and machine learning in essential public functions such as agricultural forecasting, environmental monitoring, health surveillance, and census operations, all while adhering to strict privacy and ethical standards.

In the private sector, the adoption of AI has more than doubled in just one year. Currently, 12.2% of Canadian firms are already utilizing AI for producing goods or delivering services, and 14.5% plan to adopt it within the next 12 months. These numbers are even higher in the information and cultural industries, finance and insurance, professional and technical services, and are rapidly increasing in health care and social assistance. These sectors are vital to the economic and social fabric of both Quebec and Canada, and they increasingly require specialists who can design, implement, and govern AI systems rather than just use off-the-shelf tools. A dedicated BSc in AI will expand the pool of graduates equipped with advanced theoretical and practical competencies, enabling organizations to enhance internal upskilling efforts and recruit professionals ready to lead AI integration, data-intensive analysis, and responsible innovation.

Quebec is uniquely situated to host such a program. Over the past decade, the province has intentionally built one of the world's strongest AI ecosystems, anchored by institutions like Mila, IVADO, SCALE AI, and a robust network of university labs, startups, and industrial partners. Provincial strategies, such as the Strategy for Integrating Artificial Intelligence into Public Administration (SQRI²) and targeted funding through Investissement Québec and MEIE, have positioned AI as a central pillar of Quebec’s innovation and digital transformation agenda. Furthermore, federal investments under the Pan-Canadian AI Strategy, CFREF, and recent AI-focused budgets establish AI as a long-term national priority, with billions of dollars committed to computing infrastructure, commercialization, standards, and responsible AI initiatives.

However, the current educational pathways in Quebec, while diverse, are fragmented. AI education is primarily found in computer science, data science, and specialized graduate programs, with limited integrated undergraduate options that blend rigorous mathematical and computational foundations, applied machine learning, data engineering, and training in ethics, regulation, and societal impacts. A BSc in AI would address this structural gap by providing a coherent, research-connected curriculum that prepares students to excel at the intersection of theory, application, and governance. This initiative would not only widen access to high-quality AI careers and help mitigate risks for younger and less-educated workers but also support Quebec's leadership in robust and responsible AI, ultimately driving innovation and economic growth across the province's key sectors.

4.1.4. Student Interest Surveys

4.1.4.1 Concordia University Student Survey

Overview and Methodology

- Survey Purpose: Gather feedback from students in engineering and computer science programs enrolled at the Gina Cody School of Engineering and Computer Science at Concordia University and assess the viability of three proposed programs:
    - Bachelor of Engineering (BEng) in Artificial Intelligence Engineering
    - Bachelor of Science (BSc) in Artificial Intelligence
    - Minor in AI
- Surveyed population: 2500 students
- Responses received: 1236
- Response rate: ~50%
- Sample Selection: The analysis below focuses on N=956 students (77% of respondents) who explicitly indicated interest in AI topics; 184 respondents indicated low interest and were screened out.

Respondent Profile

The student sample reflects a broad cross-section of undergraduate programs within the Gina Cody School of Engineering and Computer Science. Among respondents, approximately 81% are enrolled in Bachelor of Engineering programs (including Aerospace, Building, Chemical, Civil, Computer, Electrical, Industrial, Mechanical, and Software Engineering), while about 19% are in Computer Science or closely related joint majors (e.g., Computer Science with Data Science, Computation Arts, or Health and Life Sciences). This indicates that the survey primarily captures the perspectives of engineering students, with a substantial but smaller representation from computer science and CS-based joint programs.

The cohort is well distributed across years of study: 29% are first-year students, 26% are second-year students, 23% are third-year students, and 21% are fourth-year or above. About 1% identify as "other," including ECP, prerequisites, and part-time or mature students. This distribution shows that interest in AI-related initiatives spans all disciplines and stages of undergraduate study, offering a balanced basis for evaluating potential uptake of new AI-focused programs.

Key Findings

1. **Program Viability**
    - Minor in AI (Highest Demand): The Minor in AI emerges as the most attractive option for students. Approximately 78% of AI-interested respondents indicated they would be likely to enroll. When asked to select a single preferred path, the Minor received 439 votes, ahead of the full BEng (127) and BSc (41), reflecting a clear preference for adding AI expertise on top of existing foundational degrees.
    - BEng in AI Engineering (Strong Core Interest): The proposed BEng shows solid potential uptake: 57% of AI-interested students would be likely to apply if it were available today, and about half indicate they would have chosen it over their current program. This points to a viable market for a rigorous, systems-focused engineering pathway, with the potential to attract students who might otherwise pursue similar programs outside Quebec.
    - BSc in AI (Targeted Niche Opportunity): The BSc in AI appeals to a more specialized subset of students. Among AI-interested respondents, ~37% report they would be likely to enroll, while a significant

share indicate they would prefer to gain AI skills through a Minor or engineering degree. When the analysis is restricted to students currently enrolled in BCompSc programs (N = 214), interest in the BSc in AI increases markedly: 58% of these students report that they would be likely to enroll. This contrast suggests that the BSc in AI is particularly attractive to students already oriented toward computer science and related fields, whereas engineering students tend to prefer AI as a complementary specialization—either through a Minor or a dedicated BEng in AI Engineering—within their existing discipline. These results suggest that a BSc in AI would serve a focused population seeking a science-oriented AI pathway, and that it would be most effective as part of a broader portfolio anchored by a high-enrollment Minor and a strong BEng.

Together, these findings suggest a tiered opportunity: a widely appealing Minor in AI, a high-potential BEng in AI Engineering, and a more targeted BSc in AI for CS-focused students.

2. Reasons for Considering an AI-Focused Program

In response to Q19, which asked, "What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?" a total of 461 open-ended answers were collected. These responses were analyzed thematically, revealing that while students articulated their motivations in diverse ways, their answers consistently clustered into several clear, recurring themes.

- ***Career Competitiveness, Job Security, and Labour-Market Alignment***
  A key theme is the belief that AI skills are essential for competitiveness in today's and tomorrow's job market. Many students link an AI-focused credential to better employability, higher-quality job opportunities, and protection against automation. Students view AI as “the main attraction point” for the next decade, highlighting its growing integration into daily life. Many believe that those familiar with AI will be less likely to be replaced by it, seeing AI expertise as a safeguard against job displacement. Additionally, AI training is viewed as a way to enhance career prospects and maintain competitiveness in the evolving technology field. Overall, AI is increasingly seen as a labor market necessity, supported by strong demand for related skills

- ***AI as a Foundational, “Future-Oriented” Technology***
  A related theme is the perception of AI as an inevitable technology shaping the future of engineering, computing, and society. Students often refer to AI as “the future,” noting that “we’re heading into an AI-focused future.” They assert that AI “plays a significant role in engineering today” and that having skills in AI management is crucial. This suggests students view AI as a general-purpose technology essential for various professional fields.

- ***Intellectual Interest and Desire for Depth/Specialization***
  Many students express a strong interest in AI, viewing it as a complex and intellectually stimulating field that requires specialized knowledge. They seek a structured pathway that reduces entry barriers and facilitates access to advanced AI topics, emphasizing the need for a solid software foundation, diverse topic coverage, research opportunities, and real-world industry experience. These insights suggest that an AI-focused program is attractive not only as a credential but also as a source of rigorous training in a technically challenging and conceptually rich area.

- ***Real-World Application and Responsible Use***
  Many responses emphasize the importance of applying AI to practical, real-world challenges in a safe and structured manner. Students are eager to use AI to tackle "real-world problems" and express interest in learning to "apply existing AI technologies" effectively and safely. Some respondents highlight that "AI should be utilized in all domains," and understanding its workings is "essential for addressing modern challenges." These insights align with survey findings that show students value both technical skills and knowledge of trusted, responsible AI.

- ***Complementing Existing Degrees and Targeted Career Paths***
  Many students perceive an AI-focused program—particularly a Minor—as a complement to their primary degree, rather than a replacement for it. Some students explicitly mention that they "wouldn't consider an AI-focused program" as a full degree; instead, they see it "more as a supplement" to their existing interests in fields like computer science or engineering. Others associate AI training with specific career paths, such as robotics and embedded systems, or with "adding coding to machinery building" through a minor. This aligns with quantitative findings that indicate an AI Minor has broad appeal, as it enables students to enhance their core degrees (such as in computer science, software engineering, or electrical engineering) with specialized AI skills.

- ***Baseline AI Literacy as a Requirement for Modern Engineers***
  Many believe that AI literacy should be a standard part of engineering and computing education. One respondent highlights that it's "crucial for every computer or software engineering student to take at least one AI course" to stay current in a rapidly changing world. Students consider AI awareness and basic proficiency essential for being a "modern" engineer or computer scientist, not just optional extras.

This supports the argument for incorporating AI content in specialized degrees, as well as minors and core curricula.

3. Enhancing AI Program Appeal: Student Insights

Students provided a variety of insights on how to enhance the attractiveness of AI programs. The most frequently selected features included:

- Industry Connections: A significant majority (592 selections) indicated that opportunities to work with industry and research labs would greatly enhance the program's appeal.
- Hands-On Learning: Students favor more hands-on, project-based learning experiences (557 selections), indicating a desire for practical application of skills.
- Clear Outcomes: Many respondents (527 selections) highlighted the importance of a well-defined program structure that articulates potential career paths.
- Flexible Electives: Students expressed a strong interest (487 selections) in having flexible electives that allow the integration of AI with other fields.
- Co-op Options: While a co-op option (467 selections) was favored, mandatory co-op placements received significantly less support (195 selections), suggesting a preference for optional work-integrated learning.
- Additional Comments: A number of respondents (56 selections) provided insights through "Other" responses, emphasizing themes such as the importance of ethics in AI, the need for relevant project work from the beginning, and clarity in how AI degrees differentiate from existing computing and engineering programs.

Overall, the findings suggest that students value programs that are experiential, industry-connected, and clearly articulated in terms of career paths. Additionally, there is a call for a strong ethical dimension within the curriculum, alongside the flexibility to combine AI studies with other academic interests.

4. Student Sentiment and Considerations for Program Design

While ~80% of respondents view AI programs as highly relevant to their career goals, their qualitative feedback points to important design considerations that can strengthen a proposed BSc in AI:

- Perception of long-term value: Some students want reassurance that an "AI degree" will represent a durable, foundational credential rather than a short-lived response to current trends. They emphasize the importance of strong core training in computer science and engineering fundamentals, with AI built on top of that base, to avoid over specialization.
- Integration with existing disciplines: Many respondents see AI as closely connected to Software Engineering and Computer Science and therefore favour models where AI is clearly integrated with these disciplines-through shared foundations, electives, and cross listed courses-rather than perceived as an isolated silo. This feedback supports designing the BSc in AI with robust CS/SE fundamentals and clear pathways to combine AI expertise with broader computing skills.

5. Curriculum Requirements: “Hard” Skills & Ethics

To be successful, the program must distinguish itself through rigor and infrastructure:

- Top Priorities: Machine Learning/Deep Learning, Robotics/Embedded Systems, and Data Analytics.
- Infrastructure: Access to GPUs, cloud resources, and real-world datasets is a non-negotiable expectation (rated "Extremely Important" by nearly 40%).
- Ethics: There is strong demand for coursework covering trusted AI, safety, and societal impact, contradicting the assumption that engineering students only prioritize technical skills.

See Appendix 3 for detailed survey results.

4.1.4.2 CEGEP Student Survey on Proposed AI Programs

Overview

Concordia University's Gina Cody School of Engineering and Computer Science conducted a survey targeting CEGEP students who attended their February 2026 Open House and expressed interest in engineering and computer science programs. The survey aimed to assess student interest in two proposed AI programs:

- B.Eng. in Artificial Intelligence Engineering
- B.Sc. in Artificial Intelligence

The responses indicate very high general interest in AI, moderate stated interest in applying to a specific AI program, and a strong emphasis on career outcomes, co-op, and academic quality as decision drivers.

Student Profile

- 7 from Quebec CEGEPs (3 French, 4 English)
- 2 from Canadian high schools (one standard, one international diploma)
- 1 from an international high school
- 1 already in the final year of a bachelor’s degree

This reflects a mix of traditional CEGEP pathways and more diverse/advanced academic backgrounds.
Interest in AI and Related Programs

Prior research on AI programs

About half have already explored AI study options despite being at the pre-university/early-university level.

Current interest in AI

All respondents report high interest (4 or 5), suggesting strong intrinsic motivation toward AI as a field.

Interest in Applying to an AI Program

- Among those who answered, 3/5 show high interest in applying (4 or 5), while 2/5 show low interest (1 or 2).
- The non-response from more than half the participants (6/11) suggests uncertainty, need for more information, or survey fatigue; actual application interest is therefore unclear and likely under-defined rather than low.

Preferred Type of AI Program

- Among those who responded, interest is split evenly between an engineering-focused and a computer science–focused AI pathway.
- No stated interest in a business-oriented AI program in this small sample.
- The “not sure” response and low total response count suggest many students still lack clarity on the distinctions between program types and would benefit from clearer positioning and communication.

Key Factors Influencing Choice of an AI Program

- Career outcomes and work-integrated learning (co-op) are the dominant priorities.

- Academic substance and quality (course offerings, faculty expertise) are also highly important, reinforcing the need to highlight curriculum depth and research/industry engagement in marketing materials.
- Traditional prestige signals (program reputation) and financial support matter to a subset but are less decisive than career-related benefits in this group.
- Physical location appears to be of minimal concern for these respondents.

Brief Overall Analysis and Implications

- There is very strong general interest in AI across this small, self-selected sample, suggesting good potential demand.
- Actual willingness to apply, based on the limited answers, is promising but not yet clearly defined; many students may be in an exploratory phase and require more program details before expressing firm intent.
- Interest is balanced between an engineering-oriented and a computer science–oriented AI program, supporting the idea that both a B.Eng. in AI Engineering and a B.Sc. in AI could appeal to distinct but overlapping audiences.

Given the small sample size (n = 11) and partial response rates, these findings are indicative rather than definitive. However, they show strong enthusiasm for AI, especially regarding employability and practical experience. GCS will consider these findings to emphasize:

- Concrete career paths and industry relevance
- Strong co-op opportunities and hands-on experience
- Clear, differentiated descriptions of the B.Eng. vs. B.Sc. pathways
- Visible faculty strength and well-structured, modern AI course offerings

See Appendix 3 for detailed survey results.

4.1.5. Industry Expert Survey

Overview and Methodology

- Survey Purpose: Gather feedback from industry experts on two proposed programs:
    - Bachelor of Engineering (BEng) in Artificial Intelligence Engineering
    - Bachelor of Science (BSc) in Artificial Intelligence
- Surveyed population: 50 industry experts
- Responses received: 20
- Response rate: 40%

The survey addressed respondent profiles, current and future AI workforce needs, perspectives on BEng and BSc differentiation, desired competencies and curriculum, experiential learning, and collaboration interests.

Respondent Profile

The 20 respondents are primarily senior leaders and technical decision-makers from diverse organizations. Job titles include Presidents, CEOs, Vice Presidents, directors, and senior technical leaders. Most focus on executive or senior management (16), with notable involvement in research and R&D (7) and engineering and development (6). Fewer are engaged in operations, product management, people management, and data/AI/analytics. This indicates that the feedback reflects strategic and technical expertise.

Respondents represent organizations across sectors relevant to AI, including software, engineering consulting, healthcare technology, finance, aerospace, logistics, robotics, construction, IT services, and R&D. Company sizes range from very small (1–9 employees; 5 respondents) and small-to-medium (10–99; 8 respondents) to mid-size (100–999; 3 respondents) and large or global enterprises (1,000–9,999; 1 respondent, 10,000+; 3 respondents). This diversity ensures the survey reflects perspectives from both innovative SMEs and established organizations, providing a strong foundation for designing AI-focused BEng and BSc programs.

AI Workforce Demand and Talent Gaps
Respondents anticipate strong growth in AI-related employment. All 20 experts expect demand to rise over the next five years, with 18 predicting significant growth and 2 expecting moderate growth. Existing and emerging job titles include ML Engineers, Data Scientists, AI/ML Specialists, AI Engineers, Industrial AI Engineers, MLOps Engineers, Applied ML Scientists, AI Research Scientists, AI Transformation Leads, and Chief AI Officers. Several respondents also note the increasing importance of hybrid roles that combine AI with hardware (such as NPUs and embedded systems) and domain sciences (such as biochemistry and physiology).

Despite expected growth, organizations report significant upskilling needs and uneven hiring conditions. All 20 respondents see a moderate or higher need for AI-related training, with 12 indicating a high or critical need. Eight organizations report difficulty recruiting AI talent, four do not, and eight are unsure, often due to early-stage or indirect AI hiring. The hardest-to-fill roles require strong dual expertise (such as AI with hardware or life sciences), deep mathematical and theoretical knowledge to design new models, and high coding fluency in languages like Python, Java, or C#. Many current graduates lack the theoretical depth, problem-solving skills, and programming proficiency needed for advanced AI roles. This highlights a clear opportunity for the proposed BEng and BSc AI programs to address these gaps.

BEng vs BSc: Roles and Differentiation
Respondents clearly differentiate the BEng in AI Engineering from the BSc in AI based on implementation versus theory, hardware and system design versus analytics and modeling, and regulatory responsibility. BEng graduates are recognized for their strengths in engineering design, electronics and circuits (including higher voltages and relevant standards), system and communication architecture, and integrating AI into complex hardware and software systems such as robotics or embedded and edge devices. They are also associated with engineering licensure (for example, membership in l'Ordre des ingénieurs du Québec), regulatory compliance, project management, and complex system design. These competencies are especially valued in sectors focused on safety, standards, and physical infrastructure.

In contrast, BSc graduates are expected to focus more on the theoretical and mathematical foundations of AI and data science, with greater flexibility for domain electives such as biochemistry, neuroscience, linguistics, or geography. These electives inform model design, data interpretation, and ethical considerations. BSc graduates are well-suited for roles in model and algorithm development, data analysis, and research-oriented problem solving, often collaborating with engineering teams on feasibility and implementation. Respondents often summarize this distinction as BEng for "engineering, system design, and deployment" (including backend, robotics, and hardware enablement), and BSc for "science and analytics" (theoretical understanding, model building, and domain-informed AI research).

On the hiring side, some organizations explicitly state that electrical, embedded, and industrial AI roles (e.g., hardware design for NPU-accelerated products, firmware engineering with neural nets, industrial AI engineers, systems and software designers) either require or strongly benefit from a CEAB-accredited engineering background.
Others indicate that higher-level software roles and data science positions can often be filled by BSc graduates, though at least one organization in Montreal stresses that a BSc alone is insufficient when an engineering degree is mandated.
Overall, the feedback supports a deliberate, explicit differentiation: BEng as the pathway for regulated, hardware/system-focused AI engineering; BSc as the pathway for theory-heavy, model-centric, and domain-integrated AI roles.

Desired Graduate Profile and Curriculum Priorities
Essential knowledge and skills
The survey of industry experts identifies a clear set of technical foundations and skills that are essential for entry-level AI graduates.

Topics and Areas
Core Technical Foundations

- Strong programming skills, particularly in Python and C/C++, along with a solid understanding of algorithms, machine learning, and deep learning fundamentals, are consistently prioritized. Respondents emphasize the

need for a strong mathematical background, including linear algebra, vector calculus, probability, statistics, optimization, and thorough training in artificial neural networks and algorithm design. They also highlight the importance of precise logical reasoning and careful consideration of edge cases, noting that many current graduates lack strength in these areas.

- Data and Software Infrastructure
- Data engineering, data pipelines, and software engineering best practices such as version control, testing, and CI/CD are considered critical for entry-level roles. Respondents also highlight the importance of MLOps, including model deployment, monitoring, containerization, and the use of cloud AI services (e.g., AWS, Azure, GCP, Vertex AI, Bedrock). Graduates are expected to understand that AI models must be integrated into robust, scalable software and data infrastructure to deliver real value.
- Applied and Domain-Specific AI
- Domain knowledge in areas such as healthcare, finance, manufacturing, telecom, defence, and industrial contexts is considered an important complement to core technical skills. Experts cite applications including quality management in advanced manufacturing, data privacy, and business-focused metrics. They also highlight emerging areas such as embedded and edge AI, neural network accelerators, agentic development, and embodied or agent AI as growing priorities for future curricula.
- Research Literacy and Self-Directed Learning
- Respondents emphasize that students must learn to read and critically engage with research papers, relying on academic sources rather than popular media. They caution against “vibe coding” and over-reliance on GitHub snippets or LLM output without proper understanding. A strong capacity for self-directed, continuous learning is considered essential in this rapidly evolving field, where staying current with new methods and tools is a core professional responsibility.

Skills in high demand

- **Problem-Solving and Analytical Ability**
  Problem-solving and analytical skills receive the strongest endorsement among all competencies: 13 of 17 respondents rate them as “critically important” and 4 as “very important” for entry-level roles. Experts stress the importance of designing new models, reasoning about architecture, selecting and curating appropriate training data, and understanding the limitations and trade-offs of AI systems, rather than simply applying pre-built tools or templates.
- **Technical Proficiency and Coding Fluency**
  Technical proficiency, including programming, algorithms, machine learning, and data handling, is rated at least moderately important by all respondents, with 4 rating it “critically important” and 4 “very important.” Qualitative feedback highlights a gap in many graduates’ coding fluency and their ability to efficiently solve complex problems in languages such as Python, Java, and C#. Employers expect graduates to write, read, and review code at a professional standard, especially as LLM-generated code becomes more prevalent and requires critical evaluation.
- **Teamwork, Communication, and Project Execution**
  Teamwork and collaboration are rated “critically important” by 9 respondents and “very important” by 5. Communication skills are rated “very” or “critically important” by 12 out of 17 respondents. Experts also emphasize project and product execution skills, including defining measurable success criteria, estimating effort, managing work packages and critical paths, articulating business value such as translating model improvements into cost or revenue impact, and conducting post-mortems to turn failures into systematic learning and process improvement.
- **Ethics, Risk Awareness, and Responsible Practice**
  Ethical judgment and integrity are rated “very important” or “critically important” by 15 of 17 respondents. Risk management and awareness of AI-related risks receive similar emphasis, with 13 rating them “very” or “critically important.” Respondents call for explicit coverage of **responsible AI** topics, including explainability, fairness, bias, privacy, data sovereignty, and sustainability, such as environmentally and cost-efficient deployment and Edge AI. These are considered essential, especially for safety-critical and regulated applications.

- **Commitment to Continuous Learning**
  Commitment to continuous or lifelong learning is rated "critically important" by 6 respondents and "very important" by 5 out of 17, with only 1 rating it unimportant. Several experts specifically mention **"passion"** and intrinsic motivation as crucial, linking them to the ability to keep learning, adapt to rapid change, and maintain a competitive skill set throughout a career.

Importance of interdisciplinary expertise

- Interdisciplinary knowledge is widely valued, though its importance varies by sector and role. Of 17 respondents, 8 rate it as "very important," 7 as "somewhat important," and only 2 view it as less or not important. Qualitative responses identify relevant areas such as healthcare and medicine, telecommunications, defence, industrial applications, standards and regulatory frameworks, product and project management, operations, market intelligence, and data privacy or PII.
- Experts emphasize that AI is not a standalone activity but part of broader projects, systems, and business outcomes. Successful deployment requires the ability to select viable projects, articulate value clearly, align AI solutions with operations and product lifecycles, and navigate legal, regulatory, and ethical constraints. These responses suggest that AI programs should intentionally integrate domain exposure, regulatory awareness, and managerial decision-making with technical content.

Overall professional competencies

- Industry experts consistently advocate for a holistic professional profile rather than narrow technical training. The strongest consensus centers on problem-solving and analytical skills, supported by strong math, coding, and algorithmic foundations. Technical proficiency is expected, but it must be integrated with sound engineering practice, clear thinking, and the ability to reason about complex systems.
- Teamwork, communication, and practical experience with real-world projects, including capstones, internships, and industry collaborations, are also important, though opinions vary on whether they are "very" or "critically" important. Ethical judgment, integrity, and risk-aware practice are seen as key differentiators, especially in sectors where safety, compliance, and long-term maintainability are priorities. The high value placed on continuous learning, research literacy, and passion highlights that employers expect AI graduates to be adaptable, reflective practitioners who can evolve with the field, critically evaluate new tools, including LLMs, and contribute to both the creation and responsible stewardship of AI systems over time.

Experiential Learning and Industry Collaboration

Employers seek entry-level AI candidates with authentic, demonstrable experience. Capstone projects, internships, co-ops, and open-source contributions are most valuable when they involve original data collection, comprehensive model evaluation, and clear evidence of deep understanding. Respondents emphasize that program-mandated projects matter only if they show genuine ownership and technical rigor. They prioritize passion, logical thinking, communication skills, and self-initiative, such as self-directed projects or relevant work experience, over superficial portfolio items.
Industry partners are highly willing to support various experiential opportunities, such as onsite and virtual internships, course-based and capstone projects, short field projects, research collaborations, and mentorship. They are also open to deeper collaboration through guest lectures, advisory committees, feedback on course and program design, joint research and innovation projects, networking events, and curriculum review. There is less support for hackathons, case studies, and job shadowing.

Organizations are most willing to support **short, targeted professional certifications or AI training programs** for employees. Most respondents believe these are somewhat or extremely likely to receive subsidies.

Anticipated Future AI Challenges

They recognize emerging AI challenges, such as the commoditization of coding, greater emphasis on specification and testing, infrastructure and energy constraints, AI safety and responsible use, evolving regulations and standards, data sovereignty and security, bias, privacy, and broader ethical issues. There is concern that overreliance on AI tools may diminish junior developers' skills. Over the next 5 to 10 years, respondents expect AI to become foundational in complex systems, increasing demand for professionals with strong technical **fundamentals, ethical and regulatory**

awareness, and the ability to design, evaluate, and maintain high-quality AI systems, including updating or replacing poorly built systems.

These insights directly from industry experts provide a focused roadmap for curriculum development of the proposed program.

See Appendix 3 for detailed survey results.

4.1.6. Market Analysis

A dataset from Lightcast provides comprehensive labor market data, including job postings, insights on skills, education, industry trends, and job titles related to AI in Quebec. This data covers a 10-year period from February 2016 to February 2026 and shows a thriving job market for AI positions for individuals with a bachelor's degree or higher. Specifically, there are 2,390 unique job postings from 425 different employers in Quebec. The median advertised salary, based on 7% of the total postings, is $50.34 per hour.

In comparison, the data for all of Canada reveals 15,508 unique job postings from 1,862 employers. The median salary across Canada, based on 12% of the total postings, is reported to be $54.58 per hour. This indicates a strong demand and competitive compensation for AI expertise at the national level.

Ten-year Job Posting Trends

The ten-year trend in AI job postings for individuals with a bachelor's degree or higher, based on Lightcast data for Quebec and across Canada, shows a period of steady growth followed by a tactical slowdown from 2022 to 2024. After this slowdown, there is expected to be a significant increase in AI job postings, which nearly doubles again starting in mid-2025. Reports from Statistics Canada, the OECD, and Labour Force Survey (LFS) data largely align with the Lightcast findings regarding a surge in AI job demand beginning in mid-2025. Although their methodologies differ, Lightcast tracks "real-time" online job postings while government reports focus on broader employment levels, these major sources confirm that AI adoption reached a critical "inflection point" in 2025.

The Mid-2025 Surge: Statistics Canada's Canadian Survey on Business Conditions indicated that the percentage of businesses using AI doubled from 6.1% in early 2024 to 12.2% by the second quarter of 2025. This increase correlates directly with the spike in job postings observed by Lightcast and Indeed, where mentions of AI in job advertisements nearly doubled, reaching 6% of all postings by the end of 2025.

Data from 2025 indicates a shift in demand, with roles that augment AI (which involve collaboration with AI) growing by 2.9%, outpacing roles that compete with AI (those that could be replaced by AI).

View the job posting trends visuals in the full Lightcast Job Posting Reports found in Appendix 3.

Top Five Hiring Companies

The table below shows the top five employers of Artificial Intelligence specialists along with the total number of unique postings for each employer in Quebec and Canada over the past five years.

Rank	Employer in Quebec	Postings (Quebec)	Employer in Canada	Postings (Canada)
1	Intact Financial Corp	142	IBM	858
2	Deloitte	114	Deloitte	851
3	Bell Canada	99	Funded.club	431
4	National Bank of Canada	84	AMD	404
5	IBM	75	Cognizant Technology Solutions	350

Both the OECD and Lightcast identify the same "Top 3" sectors driving this demand: Professional, Scientific and Technical Services (accounting for nearly 30% of postings), Financial Services, and Information/Communication.

Top Job Titles
The table below shows the top seven AI-
related job titles in demand along with the number of unique postings for each job title for both Quebec and Canada:

Rank	Job Title (Quebec)	Unique Postings (Quebec)	Job Title (Canada)	Unique Postings (Canada)
1	Data scientists	1,120	Data scientists	6,340
2	Software developers and programmers	760	Software developers and programmers	4,370
3	Database analysts and data administrators	174	Database analysts and data administrators	1,548
4	Computer engineers (except software engineers and designers)	109	Software engineers and designers	1,209
5	Software engineers and designers	95	Computer engineers (except software engineers and designers)	1,080
6	Information systems specialists	73	Information Systems Specialists	491
7	Mathematicians, statisticians and actuaries	55	Mathematicians, statisticians and actuaries	440

See the two full Lightcast reports in Appendix 3 for more details.

4.1.7. Future prospects for graduates

Labour Market Demand and Opportunities
Graduates from the BSc in AI program will enter a robust and expanding labor market with exceptional growth prospects. According to the National Occupational Classification (NOC 21211)[13], AI specialists are primarily classified as Data Scientists, encompassing roles such as AI analysts, consultants, machine learning engineers, and data architects. The Quebec labor market demonstrates strong demand for these skills, with approximately 59% of the provincial workforce in jobs with high exposure to AI as of 2024-2025. View the original report at Institut de la statistique du Québec.

The current workforce of approximately 2,500 Data Scientists in Quebec (2021 data) is heavily concentrated in Montreal, which hosts 82% of the province's professionals in this field (~2,060 workers). The job outlook for 2024-2027 remains moderate to good, with steady growth expected despite some market stabilization following the post-pandemic surge.

Compensation and Career Advancement
In Montreal, jobs in AI and data, such as Data Scientists and Researchers, offer salaries that significantly surpass the provincial median. Top-tier AI Research positions often require advanced academic degrees.

For Data Scientists, starting salaries typically range from $78,000 to $105,000, and can exceed $185,000 at senior levels. Meanwhile, AI Research roles generally start between $95,000 and $130,000, with the potential to exceed $250,000 for more experienced individuals.[14]

[13] Employment and Social Development Canada. (2025). Data scientists (NOC 21211.00). National Occupational Classification. https://noc.esdc.gc.ca/OaSIS/OaSISOccProfile?code=21211.00&version=2025.0
[14] 2727 Coworking. (2025). Montreal tech salary guide 2025. https://2727coworking.com/articles/montreal-tech-salary-guide-2025

Industry Sectors and Employment Opportunities

Quebec's AI ecosystem spans diverse industries, providing graduates with multiple career pathways[15]:

- Technology Sector (Computer Systems Design - 21% of workforce): Major employers include global tech leaders such as Google (Google Brain & DeepMind), Meta (FAIR), Microsoft Research, and IBM, alongside successful local companies like Coveo, BrainBox AI, and Hopper.
- Financial Services (26% of workforce): The sector includes Borealis AI (Royal Bank of Canada), Intact Financial, National Bank of Canada, and international firms like Morgan Stanley and BNP Paribas.
- Public Administration (7-10%): Federal and provincial agencies increasingly require AI expertise for digital transformation and service delivery optimization.
- Aerospace and Manufacturing: Companies like Bombardier and CAE are integrating AI for automation and simulation applications.
- Specialized AI Agencies: Quebec City hosts growing companies like Vooban, Junifia, Zenidata, and emerging firms in mining automation and climate modelling.

Regional Opportunities

While Montreal dominates the market as a global AI hub housing the world's largest concentration of academic deep learning researchers, other regions present unique opportunities. Quebec City supports over 500 high-tech companies focusing on robotics and life sciences, while areas like Lanaudière and Laurentides show "Very Good" outlook ratings due to high replacement demand relative to available talent pools.

Advanced Study and Research Pathways

Graduates seeking advanced research careers can access Quebec's world-class ecosystem through partnerships with Mila and affiliated universities[16]. Specialized research opportunities span:

- Natural Language Processing and Computer Vision at **Université de Montréal**
- Reinforcement Learning and Robotics at **McGill University**
- Mobile Robotics and Autonomous Systems at **Polytechnique Montréal**
- Decision Sciences and Business Intelligence at **HEC Montréal**
- Intelligent Systems and Signal Processing at **ÉTS Montréal**
- Applied Artificial Intelligence Research at **Concordia University** through the Concordia-Mila partnership, where students can pursue graduate degrees under Mila-affiliated faculty supervision, with access to specialized training programs including the Mitacs-Concordia AI Training Series and the Graduate Microprogram in Applied AI

Strategic research priorities include AI4Science, environmental applications, and responsible AI development, positioning graduates at the forefront of emerging technological frontiers.

Societal Impact and Professional Mobility

BSc in AI graduates will play crucial roles in addressing Quebec's digital transformation challenges. With only 12.2% of businesses currently utilizing AI, graduates can lead SME digital transformation initiatives while helping close the critical skills gap that Canadian businesses identify as the primary barrier to AI adoption.

Societal Contributions to Quebec:

- Economic Competitiveness: AI adoption in Quebec's manufacturing sector alone is expected to significantly reduce human error and optimize resource utilization, helping firms compete globally. Estimates suggest AI could boost the province's GDP by over $10 billion by 2030.

[15] Data Sources: Information for these employment insights is compiled from investment and economic agencies (Investissement Québec and Montréal International), live job portals monitored December 2025–March 2026 (LinkedIn, Glassdoor, Indeed, and Canada's Job Bank), industry directories (Built In Montreal, Clutch, and F6S), and ecosystem reports (Mila Impact Reports and QuebecTech).

[16] Mila - Quebec Artificial Intelligence Institute. (n.d.). Core expertise. https://mila.quebec/en/research/core-expertise

- Public Well-being: Graduates contribute to AI-driven tools that improve healthcare (e.g., cancer screening), precision agriculture, and environmental sustainability. AI applications in these domains can enhance quality of life, increase food security, and address pressing climate challenges.
- Ethical Leadership: By training in Quebec, which leads in responsible AI development, graduates help ensure technologies respect human rights and inclusion. They are equipped to deploy AI systems that are transparent, unbiased, and aligned with societal values.

Addressing Specific Needs-Analysis Issues:

- Closing the Skill Gap: Canadian businesses report difficulty finding employees with AI expertise as the top barrier to adoption. BSc in AI graduates directly address this by providing the "build and maintain" skills required to integrate AI solutions.
- Supporting SMEs: Only 12.2% of businesses currently use AI. Graduates can lead the digital transformation of SMEs, which often lack the internal knowledge to identify business cases for AI. By assisting smaller firms, graduates drive broader economic benefits.
- Workforce Resilience: Rather than replacing jobs, AI is largely seen as complementary. BSc in AI graduates are essential for designing systems that assist existing workers, focusing on higher value-added tasks rather than automation-led elimination. This helps build workforce adaptability and resilience.
- The program's emphasis on responsible AI development ensures graduates contribute to ethical technology deployment, supporting Quebec's leadership in human-rights-respecting AI applications across healthcare, environmental sustainability, and public service delivery.
- Professional mobility is enhanced through Quebec's specialized immigration pathways for AI workers, though graduates must secure positions with minimum salaries of $75,000 (outside Montreal) or $100,000 (within Montreal) to qualify.

4.2 Systemic Relevance and Opportunity

4.2.1 Programs Related to Artificial Intelligence in Canada

Across Canada, Artificial Intelligence is most often embedded within Computer Science and traditional engineering programs, rather than offered as standalone degree in Artificial Intelligence.

AI at the undergraduate level in Canada is commonly offered as:

- Computer Science or Software Engineering degrees with AI specializations/streams (e.g., University of Waterloo, University of Alberta, University of Manitoba, Carleton University), typically including ~24–36 credits of AI-related courses within broader degrees.
- Applied or professional bachelor’s degrees with AI/ML focus (e.g., Durham College, College of the North Atlantic, Seneca Polytechnic).
- There are currently three CEAB-recognized engineering programs with a primary focus on AI and its integration into engineered systems.

The table below summarizes bachelor's programs in AI and AI-specialized bachelor's programs in Canada (Other than Quebec)

	Institution	Degree	Credits required in AI courses
BEng programs in Artificial Intelligence	Ontario Tech University (ON)	Bachelor of Engineering (Honours) in Artificial Intelligence	~33 credits (11 courses + capstone)
	Western University (ON)	Bachelor of Engineering Science in Artificial Intelligence Systems Engineering (AISE)	~42 credits (~12-14 courses) + Electives
	Algonquin College, (ON)	Bachelor of Engineering – Automation and Robotics	~27 credits (~9 courses)

Undergraduate programs with AI Specialization/Stream (BSc/BComp/BASc/BEng)	Carleton University (ON)	Bachelor of Computer Science – Artificial Intelligence & Machine Learning stream	18-24 credits (~6-8 courses)
	College of the North Atlantic (NL)	Bachelor of Applied Information Technology – Artificial Intelligence & Machine Learning	~36 credits (10 + capstone)
	Durham College (ON)	Bachelor's degree (honours) – Artificial Intelligence	~48 credits (16 courses + 1 capstone + 1 field placement)
	Trent University (ON)	BSc or BA - Honours - in Artificial Intelligence	~33 credits (11 courses)
	University of Alberta (AB)	Bachelor of Science with Major in Computing Science – Artificial Intelligence option	~24 credits (8 courses)
	University of Manitoba (MB)	Bachelor of Science in Computer Science – Artificial Intelligence	Up to 27 credits (approx. 9 courses)
	University of Waterloo (ON)	Bachelor of Computer Science - Artificial Intelligence Specialization	~24 credits (8 courses)
	University of Waterloo (ON)	Bachelor of Software Engineering - Artificial Intelligence Specialization	~24 credits (8 courses)
	University of Waterloo (ON)	Bachelor of Math - Artificial Intelligence Specialization	~24 credits (8 courses)
	Seneca Polytech (ON)	Bachelor of Engineering (Software Engineering)-Heavy emphasis on AI	~24-30 credits (8-10 courses)

In addition, Canadian institutions offer numerous **minors**, **certificates**, **microprograms**, and **diplomas** in AI and related areas (e.g., University of Alberta's "AI Everywhere" certificate; AI Engineering minors at the University of Toronto and University of Waterloo; AI microprograms at the University of Ottawa and University of Manitoba). These are mainly designed to:

- Upskill students from other majors.
- Support professional development and reskilling.
- Complement, rather than constitute, full engineering credentials in AI.

The following table summarizes these offerings across the major Canadian institutions:

Institution	Credential Type	AI Focus / Credits	Target Audience
U of Alberta	AI Everywhere Certificate	15 units (5 courses)	All undergraduate students
U of Toronto	AI Engineering Minor	~18–24 credits	Engineering students only
U of Waterloo	AI Engineering Minor	~24 credits	Engineering students
Dalhousie U	AI & Intelligent Systems Cert.	~12–15 credits	Computer Science students
U of Manitoba	AI Micro-certificate	3 courses	Professionals & students
U of Ottawa	Interdisciplinary AI Microprogram	9 units (3 courses)	Interdisciplinary students
Athabasca U	AI & ML Minor	18 credits	B.Sc. students
Concordia U	Applied AI Microprogram	8 credits (2 courses)	Alumni & Professionals
McGill U	Applied AI Prof. Development Cert.	Short-format	Working Professionals
BCIT	AI & ML Diploma Option	2-year program	Full-time diploma students

4.2.2. International Benchmarks

The following internationally recognized programs further illustrate typical characteristics of strong AI degrees:

- Nanyang Technological University (NTU, Singapore) – B.Sc. in Data Science and AI: Jointly offered by Computing and Mathematical Sciences, with a pronounced emphasis on statistical and mathematical foundations.
- Tsinghua University (China) – Bachelor in AI: Elite AI track with extensive industry partnerships and a focus on large-scale AI systems.
- ETH Zurich (Switzerland) – B.Sc. in Computer Science (AI Track): A CS degree with a renowned AI concentration, particularly strong in robotics and visual computing, emphasizing hardware–software integration.
- IE University (Spain) – B.Sc. in Computer Science & AI: Project-based, "AI for Business and Society" orientation, accredited under the Bologna Process.
- Tetr (Global) – B.Sc. in Artificial Intelligence: An immersive multi-country model with rotations through several global tech hubs.

Collectively, these benchmarks indicate that high-quality AI degrees are:

- Interdisciplinary (computing, math, systems, often with a human or societal dimension).
- Supported by at least 30 credits of AI-specific coursework.
- Deeply integrated with industry and applied research.

The proposed Concordia BSc in AI fits this emerging global profile while adding a distinctive focus on secure-by-design AI, trustworthy systems, and virtual-unit governance.

4.2.3. Similar and Related Programs in Quebec

Quebec is a global hub for AI, with a wide range of undergraduate minors, certificates, and graduate programs.

The following table outlines representative AI-related offerings:

Institution	Program Title	Program Type	# of Credits Dedicated to AI*
McGill University	Minor Applied Artificial Intelligence	Minor (Undergrad)	22–25
McGill University	Major Computer Science - AI	B.Sc. (Honours/Major)	~24
Concordia University	Applied AI Microprogram	Graduate Microprogram	8
U. de Montréal (UdeM)	D.E.S.S. en Apprentissage Automatique	Specialized Grad Diploma	30
U. de Montréal (UdeM)	Maîtrise en Apprentissage Automatique	Master's (Professional)	45
U. de Montréal (UdeM)	IA au travail: Utilisation responsable	Certificate (Undergrad)	30
Université Laval	D.E.S.S. en Intelligence Artificielle	Specialized Grad Diploma	24
Université Laval	Microprogramme en Données Massives	Microprogram (Grad)	12
Polytechnique Montréal	Maîtrise professionnelle (ou DESS) modulaire en Génie informatique Option Intelligence artificielle en divertissement numérique interactif	Master's (Professional)	45
UQAC (Chicoutimi)	Mineure en Science des Données et IA	Minor (Undergrad)	30
UQAC (Chicoutimi)	Master's degree in computer science (artificial intelligence)	Master's (Research)	45
UQAM	Maîtrise en Informatique (Option IA)	Master's (Research)	~45
HEC Montréal	M.Sc. Intelligence d'affaires	Master's (Professional)	45

**Note: For Bachelor's degrees and minors, this represents only the credits specifically allocated to AI/ML courses, excluding core computer science or math foundations. Master's and D.E.S.S. credits represent the total program weight, which is typically entirely focused on AI/Data Science.*

Key characteristics of the Quebec landscape are:

- A strong “bacc par cumul” model at French-language universities, combining multiple 30-credit certificates (e.g., AI, computer science, cybersecurity) into flexible bachelor’s degrees.
- A dense graduate and research ecosystem (Mila, IVADO, multiple D.E.S.S. and master’s programs) emphasizing advanced theory and industry collaboration.
- A focus on minors, certificates, microprograms, and professional development, rather than integrated, CEAB-accredited AI engineering degrees.

The justification for a specialized BSc in AI in Quebec's educational landscape is rooted in the province's position as a global AI hub and the evolving demands of its labour market. While a traditional Computer Science (CS) degree offers breadth, a specialized BSc in AI provides the depth and targeted training necessary to enter an "elite cohort" where advanced credentials are often the norm.

4.2.4. Market Position and Distinctive Contribution of the Proposed BSc in AI

The proposed BSc in Artificial Intelligence at Concordia would be one of the few specialized BSc in AI in Quebec. Situated in Montreal—home to Mila and IVADO—it would leverage a world-leading AI ecosystem while filling a clear structural gap in the provincial university system.

The program is differentiated by four core pillars:

1. **Virtual AI Engineering Unit (AIE) and Multi-Department Governance**
    - The AIE Virtual Unit integrates Electrical and Computer Engineering (ECE), Computer Science and Software Engineering (CSSE), and the Concordia Institute for Information Systems Engineering (CIISE).
    - This design creates a balanced, full-stack AI curriculum, covering algorithms and software, and large-scale, secure AI deployment.
    - It explicitly avoids disciplinary silos and mirrors (while extending) the cross-departmental models seen at UPenn and CUHK.

2. **Systems and Infrastructure Focus via CIISE**
    - Integrates cybersecurity, cloud infrastructure, and safety-critical systems into AI training.
    - Prepares graduates not only to design models, but to deploy AI securely and reliably in complex industrial and societal environments, aligned with the needs of Quebec’s aerospace, finance, health, and cybersecurity sectors.

3. **Trustworthy and Explainable AI as Technical Outcomes**
    - Treats fairness, explainability (XAI), and accountability as explicit competencies, not only as general ethics topics.
    - Aligns with Quebec and Montreal leadership in AI ethics (e.g., the Montreal Declaration) and with emerging provincial and federal frameworks for responsible AI.

4. **Location within Montreal’s AI Ecosystem**
    - Access to a dense network of AI research labs, startups, and established industries for co-op, internships, and capstone projects.
    - Strong synergy with the Concordia Applied AI Institute, creating a direct pipeline between undergraduate education, research, and industry.

4.2.5. Impact on Existing Programs

Within Concordia, the proposed BSc in AI is designed to be **complementary** to existing programs in ECE, CSSE, and CIISE:

- It will attract students who are specifically seeking a dedicated AI pathway.

- It will consolidate AI-related offerings from participating departments, creating a clear, structured program rather than dispersing AI content across multiple degrees.
- Shared foundational and elective courses will maintain healthy enrolments in existing programs, while new AI-specific courses will expand the overall portfolio rather than duplicate content.

At the Quebec system level, the new program will build on, rather than replace, existing minors, certificates, D.E.S.S., and master's programs by providing:

- A robust undergraduate pipeline of students prepared for advanced AI studies and research.
- Well-trained graduates ready for AI-intensive roles in Quebec's key sectors.

4.2.6. Partnerships and Collaborations

By having Concordia University in Montreal, the university benefits from direct access to a globally recognized AI ecosystem. Montreal is a global AI hub by combining top-tier academic research with a dense network of industry, start-ups, and public-sector partners. This concentration of talent, labs, funding programs, and real-world deployment opportunities helps accelerate collaboration, training, and innovation, creating a uniquely rich environment for AI educational programs, research, and impact.

Many professors from ECE, CSSE, and CIISE are founding and active members of the Concordia Applied AI Institute (A2I), Concordia's university-wide hub for applied AI. A2I's mission is to demystify AI and accelerate its responsible adoption by enabling real-world applications and collaborations across the sciences, engineering, arts, business, and the humanities. Through interdisciplinary research and partnership-driven projects, A2I helps translate AI advances into practical tools and solutions, encouraging researchers to put AI into practice, tackle complex societal and industrial challenges, and identify opportunities where AI can deliver measurable benefits for people and organizations. The institute has strong collaborations with industry, government organizations, and communities.

In addition, CSSE professors Dr. Eugene Belilovsky, Dr. Yang Wang, Dr. Mirco Ravanelli, Dr. Elvis Dohmatob, and Dr. Mahdi S. Hosseini are Associate Academic Members of Mila (Quebec Artificial Intelligence Institute), an internationally recognized AI research institute that brings together professors, students, and research staff to advance scientific discovery and promote the responsible development of AI for societal benefit. Mila also acts as a province-wide hub, connecting researchers across Université de Montréal, McGill University, Polytechnique Montréal, HEC Montréal, Université Laval, Université de Sherbrooke, École de technologie supérieure (ÉTS), and Concordia University.

Moreover, a large number of professors from ECE, CSSE, and CIISE have held Canada Research Chairs, Concordia University Research Chairs, and Gina Cody Research and Innovation Fellowships in AI and applied AI, spanning areas such as biomedical engineering, autonomous vehicles, robotics, AI for IT Operations, computer vision, AI-Human Interaction, and related fields.

From CSSE:

- Dr. Tristan Glatard, Founding Director, Co-Director, Concordia Applied AI Institute (2020-2024). Canada Research Chair (Tier II) in Big Data Infrastructures for Neuroinformatics.
- Dr. Yann-Gaël Guéhéneuc, Canada Research Chair (Tier I) in Empirical Software Engineering
- Dr. Elvis Dohmatob, Canada Research Chair (Tier II) in Computing for the Greater Good
- Dr. Emad Shihab, Concordia University Research Chair in Data Analytics for Software Ecosystems
- Dr. Brigitte Jaumard, Concordia University Research Chair in Optimization of Communication Networks
- Dr. Yiming Xiao, Concordia University Research Chair in Intelligent & Intuitive Surgical Technology
- Dr. Shin Hwei Tan, Gina Cody Research Chair in Computer Science and Software Engineering
- Dr. Ching Y. Suen, Concordia Honorary Chair on AI & Pattern Recognition

From CIISE:

- Dr. Nizar Bouguila, Founding Director, Co-Director, Concordia Applied AI Institute. Concordia University Research Chair in Applied Artificial Intelligence.
- Dr. Jun Yan, Concordia University Research Chair in Artificial Intelligence in Cybersecurity and Resilience. Co-Titulaire de la Chaire de recherche Concordia-MCN sur la cybersécurité et la résilience des réseaux de l'administration publique, in collaboration with the Ministère de la Cybersécurité et du Numérique (MCN) du Québec.
- Dr. Mourad Debbabi, Concordia – Hydro-Québec – Hitachi Systems Security Inc. Partnership Research Chair in Enhancing the Resilience and Security of the Smart Grid. Co-Titulaire de la Chaire de recherche Concordia-MCN sur la cybersécurité et la résilience des réseaux de l'administration publique, in collaboration with the Ministère de la Cybersécurité et du Numérique (MCN) du Québec.
- Dr. Suryadipta Majumdar, Co-Titulaire de la Chaire de recherche Concordia-MCN sur la cybersécurité et la résilience des réseaux de l'administration publique, in collaboration with the Ministère de la Cybersécurité et du Numérique (MCN) du Québec.
- Dr. Chadi Assi, Concordia University Research Chair in broadband wireless networks.
- Dr. Carol Fung, Gina Cody Research Chair in Cybersecurity and the Internet of Things.
- Dr. Lingyu Wang, NSERC/Ericsson Senior Industrial Research Chair in Software-Defined Networking and Network Functions Virtualization Security (2000-2025)
- Dr. Jeremy Clark, NSERC/Raymond Chabot Grant Thornton/Catallaxy Industrial Research Chair in Blockchain Technologies (2000-2025)
- Dr. Roch Glitho, NSERC/Ericsson/ENCQOR 5G Senior Industrial Research Chair in Cloud and Edge Computing for 5G and Beyond (2000-2025). Follow of Engineering Institute of Canada.

From ECE:

- Dr. Habib Benali, Tier 1 Canada Research Chair in Biomedical Imaging and Healthy Aging
- Dr. Krzysztof Skonieczny, Tier 2 Canada Research Chair in Aerospace Robotics
- Dr. Hassan Rivaz, Concordia University Research Chair Medical Imaging with Deep Learning
- Dr. Kash Khorasani, Honorary Tier I Concordia Research Chair in Control of Autonomous Network of Unmanned System
- Dr. Abdelwahab Hamou-Lhadj, Gina Cody Research and Innovation Fellow, Trustworthiness of Systems-of-Systems Using AI for IT Operations
- Dr. Yan Liu, Gina Cody Research and Innovation Fellow, Data-driven Proactive Planning and Recommendation Using Heterogeneous Spatiotemporal Data

4.3 Institutional Relevance and Opportunity

The proposed BSc in Artificial Intelligence (AI) aligns with and supports Concordia University's mission and nine strategic directions by leveraging the established expertise of the Gina Cody School of Engineering and Computer Science and the Applied AI Institute.

4.3.1 Integration into Institutional Plans and Strategic Directions

The program supports several key institutional directions:

Strategic Research and Academic Excellence

The program advances the mission to **double research** capacity by embedding research-informed learning into project-based courses and capstones. By channeling undergraduates into the Applied AI Institute, NSERC, and IVADO ecosystems, the degree expands institutional impact in a high-priority area. To **teach for tomorrow**, the curriculum integrates rigorous mathematical fundamentals—including linear algebra, probability, and optimization—with advanced machine learning and autonomous systems. This ensures graduates possess the deep technical expertise required for emerging roles in digital and agentic AI.

Experiential Learning and Technical Innovation
Guided by the principle to **get your hands dirty**, the co-op–eligible program mandates extensive experiential learning through internships and applied research. Graduates will demonstrate proficiency in industry-standard tools, Python-based ecosystems, and cloud-deployment environments. The program's governance through the AI Engineering Virtual Unit (integrating ECE, CSSE, and CIISE) allows students to **mix it up**, fostering the multidisciplinary collaboration necessary to bridge software and hardware engineering. This structure enables Concordia to **experiment boldly**, piloting a curriculum that treats system reliability, risk management, and model robustness as core engineering outcomes rather than secondary electives.

Responsible Governance and Global Leadership
To **grow smartly**, the program addresses the surging demand for AI-specialized graduates who understand the complexities of data governance, privacy, and algorithmic bias. By focusing on standards and regulations, the degree prepares students to navigate evolving global AI frameworks and sector-specific compliance. As we **embrace the city and the world**, students will leverage partnerships with Mila and IVADO to tackle urban challenges in healthcare and transportation through a lens of transparency and accountability.

4.3.2 Status Relative to Existing Programs and Enrolments
The BSc in AI leverages existing strengths in **Electrical and Computer Engineering (ECE), Computer Science and Software Engineering (CSSE), and Information Systems Engineering (CIISE).** Although these departments have experienced steady growth in AI and cybersecurity coursework, the proposed program addresses a distinct need by offering a specialized and integrated AI degree for Quebec.

The curriculum does not replicate existing offerings; instead, it consolidates and enhances AI-related courses that are currently spread across three units into a cohesive professional pathway. This program aims to attract:

- Students who currently leave Quebec to pursue specialized AI degrees.
- New applicants who are specifically looking for a credential focused primarily on AI, rather than a generalist degree.

To ensure the stability of related programs, the BSc in AI shares a common first-year foundation with existing degrees. Established ECE, CSSE, and CIISE programs will remain the primary choice for students seeking broader specializations, while the new AI-specific courses and capstones will expand Concordia's total course portfolio rather than fragmenting it. Overall, the impact is expected to be a net positive, increasing total GCS applications and reinforcing Concordia's leadership in a high-demand sector.

4.3.3 State of Research, Creation and Teaching in AI at Concordia
Concordia already has substantial research and teaching activity in AI and related fields:

- The Concordia **Applied AI Institute** coordinates AI research and training across faculties and maintains strong partnerships with industry and government.
- Faculty members in ECE, CSSE, CIISE, Mathematics & Statistics, and other units conduct research in machine learning, data science, optimization, robotics, computer vision, cybersecurity, information systems, and human–technology interaction.
- Graduate education includes AI-relevant MSc and PhD programs in engineering and computer science, as well as an Applied AI graduate microprogram.

The BSc in AI will formalize and extend this ecosystem at the undergraduate level by:

- Providing a structured pipeline of students prepared for AI-focused graduate research.
- Integrating ongoing research (e.g., NSERC, IVADO, industry-funded projects) into undergraduate labs, projects, and capstones.
- Supporting Concordia's strategic goal of more fully integrating research into every student's learning experience ("Double our research").

4.3.4 Demonstrated Institutional Expertise and Feasibility

Concordia has already developed particular expertise in AI through:

- Established programs in software and computer engineering, computer science, and information systems engineering that include AI, data science, and cybersecurity content.
- The Applied AI Institute and numerous externally funded projects in AI and data-driven technologies.
- Existing co-op and experiential learning infrastructure that connects engineering students to Montreal's AI-intensive industries.

Feasibility is supported by:

- Existing faculty strength across the three participating units, providing the critical mass needed to staff the core AI curriculum.
- Shared laboratory and computing infrastructure, including access to high-performance computing and GPU resources through research projects and central services.
- Proven governance and administrative capacity in the Gina Cody School to launch and sustain interdisciplinary undergraduate programs.

In sum, the proposed BSc in AI is fully consistent with Concordia's mission and strategic directions, builds directly on established strengths in AI research and education, and represents a targeted, feasible and timely expansion in an area of clear institutional and societal opportunity.

5. PROGRAM OBJECTIVES

5.1 Output Profile

We have identified the following key trends for undergraduate Artificial Intelligence programs:

1. **Emphasis on Fundamentals:** A strong foundation in the mathematical fundamentals of AI, including linear algebra, probability, optimization, algorithms, and machine learning, is essential.
2. **Practical Experience:** Graduates must have hands-on experience in designing, implementing, training, and deploying AI models and intelligent systems in real-world applications.
3. **Focus on Data and Ethics:** Responsible use of data is central to AI. Graduates must understand data governance, privacy protection, algorithmic bias, and the ethical implications of AI-driven decision-making.
4. **Standards and Regulations:** Graduates must be familiar with emerging AI governance frameworks, standards, and regulations, including responsible AI guidelines, data protection laws, and sector-specific compliance requirements.
5. **Emerging Technologies:** Students should be exposed to rapidly evolving AI technologies, such as deep learning, generative AI, reinforcement learning, edge AI, agentic AI and autonomous systems, and understand their impact across industries.
6. **System Reliability and Risk Management:** Graduates should understand the risks associated with AI systems, including model robustness, safety, explainability, and failure modes, as well as methods for risk assessment and mitigation.
7. **Communication and Collaboration**: AI practitioners must be able to communicate effectively and collaborate with multidisciplinary teams, including software and hardware engineers and practitioners, domain experts, decision-makers, and end-users. These skills are emphasized throughout the program.
8. **Industry Tools and Technologies:** Graduates should be proficient with industry-standard AI tools and platforms, such as Python-based ecosystems, machine learning frameworks, data science pipelines, and cloud-based AI deployment environments.
9. **AI Ethics and Societal Impact:** Graduates must understand ethical and societal issues surrounding AI, including transparency, accountability, fairness, and the broader implications of deploying AI in critical and public-facing systems.
10. **Practical Experience:** Internships, co-op placements, and applied research projects provide opportunities for students to gain hands-on experience and professional skills. These experiences are integral to preparing

graduates for careers in the AI industry.

5.2 General and specific program objectives

The purpose of the proposed program is to train Artificial Intelligence professionals with high-value skills for a broad range of industrial, government, and non-profit sectors in Quebec and worldwide. Graduates will help close critical talent gaps and drive economic growth by designing, deploying, and maintaining intelligent systems that enhance productivity, innovation, and competitiveness across the digital and physical economy.

5.1.1. General Educational Objectives

- Apply technical knowledge in mathematics and computer science to design and implement intelligent systems and generate innovative AI-based solutions to problems in industry and society, including the development and deployment of AI technologies across the digital economy.
- Analyze processes and systems through the lens of AI system performance, reliability, safety, and fairness in order to understand the technical, economic, and societal impacts of design decisions, and to prioritize professional ethics, accountability, and responsible AI practices in decision-making.
- Pursue advanced degrees or professional certifications leading to careers in academia, research and development, entrepreneurship, or professional practice in sectors such as healthcare, finance, transportation, and public services.
- Demonstrate a commitment to lifelong learning by continuously acquiring new knowledge, developing new skills, and gaining proficiency in emerging AI methods, tools, and computing practices.

5.1.2. Specific Program Outcomes

By the end of the program, students should be able to:

- Identify, formulate, and solve complex problems by applying principles of computer science and mathematics and by using the appropriate tools.
- Design sustainable solutions that meet specified needs with consideration of all stakeholder views, public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Communicate complex concepts or processes effectively in oral, written, and graphical forms with a range of audiences.
- Contribute within a diverse team to complete a design solution, while supporting a collaborative and inclusive environment.
- Design and conduct appropriate experimentation, analyze and interpret data, and use judgment to draw conclusions.
- Identify their own learning needs and update their skill sets to maintain competence and contribute to the advancement of knowledge.

6. REGULATORY FRAMEWORK

6.1 Admission Requirements and Processes

A summary of the admission requirements and processes at the GCS is given here; for further description of the admission requirements and processes for Concordia University please consult the following sections of the Undergraduate Calendar (UC): general admissions in Section 13[17]; and GCS admissions in Section 71.10[18]. The UC is available online.

[17] https://www.concordia.ca/academics/undergraduate/calendar/current/section-13-admission-regulations.html
[18] https://www.concordia.ca/academics/undergraduate/calendar/current/section-71-gina-cody-school-of-engineering-and-computer-science/section-71-10-gina-cody-school-of-engineering-and-computer-science.html

6.1.1. General Admission Requirements

All applications to Concordia University go through a single processing center. Quebec applicants must: 1) successfully complete a two-year pre-university program in a CEGEP and qualify for a Diploma of Collegial Studies (DEC) or the equivalent, 2) have completed a three-year professional program in a CEGEP, or 3) have obtained a French or International Baccalaureate. Graduates from secondary schools in Canadian provinces and territories outside Quebec are considered for admission to the Extended Credit Program (ECP), which requires students to take 30 credits in addition to the regular program requirements. Transfers from other universities are possible. Applicants from outside of Canada are eligible, with further information available in Section 19 of the UC[19]. At the time of application, students can identify whether they would like to be considered for the co-operative education program.

The language of instruction at Concordia University is English, while most assignments and examinations may be submitted in French. Students whose first language is not English must demonstrate language proficiency prior to admission through achieving the appropriate score on one of five standardized English tests (Test of English as a Foreign Language, etc.) if they do not satisfy any of the exemption criteria.

6.1.2. Gina Cody School of Engineering and Computer Science (GCS) Admission Requirements for BSc in AI

For Quebec applicants, there is a required CEGEP course profile of Mathematics 201 (103 or 201-NYA and 203 or 201-NYB and 105 or 201-NYC). As mentioned above, out-of-province applicants are considered for the ECP program if they do not have sufficient pre- university education (e.g., International Baccalaureate). As mentioned in the previous section, students in the ECP program must take 30 additional credits. The ECP for the BSc in AI will consist of a foundation in mathematics (9 credits), 6 credits of humanities and social science electives, and 15 credits of general electives. Mature entry admission requirements are available in Section 14 of the UC.

6.1.3. BSc in AI Admission Requirements

Specific grade requirements for the program will be determined after the Curriculum Committee (defined in Section 6.3.1 of this document) evaluates the applications received, but are expected to be relatively in line with the grade requirements of the BCompSc[20], which are summarized below:

- Quebec CEGEP: 25 overall (R-score) and if taken, 26 in math.
- High school: B overall, B+ in math.
- International Baccalaureate: 29 overall, 4 HL or 5 SL math.
- International Baccalaureate Career-related Programme (CP): 5.5/7 overall, 5 HL or 6 SL math, 5 HL or SL physics
- French Baccalaureate: 13 overall, 14 in math.
- British system of education (GCE):
    - A-levels: At least two A-level exams AB, A in math; or
    - AS-levels: At least 4 AS-level exams with equivalent results; or
    - BTEC: Level 3 Diploma or Extended Diploma in a related subject area with equivalent results.
- University transfer (internal): 2.7 overall, 3.0 in math, 1.7 in courses offered by GCS.
- University transfer (external): B overall, B+ in math.

6.2 Commitment and structure of the program

The program is 90 credits (26 courses) for full-time studies, with a duration of three years. Exceptions are the ECP described in the previous section, requiring 30 additional credits.

Mandatory credits (90 credits):

1. AI Core Courses: 21 courses (72 credits)
2. Technical Elective Courses: 6 courses (12 credits)
3. General Education Elective Courses: 2 courses (6 credits)

[19] https://www.concordia.ca/academics/undergraduate/calendar/current/section-19-international-students.html
[20] https://www.concordia.ca/academics/undergraduate/computer-science.html

The AI core include courses which address:

- Science Knowledge: solid foundation in mathematics, physics, electrical and computer network systems.
- AI Fundamentals: Mathematics for AI, Machine Learning and Deep Learning, software engineering and programming, computing systems and infrastructure, deployment, safety, and lifecycle.
- Experiential learning: courses incorporating practice in theory.

The technical elective courses allow students to concentrate in the following subject areas:

- AI Hardware and Intelligent Systems
- AI Software
- Cybersecurity for AI

Two optional activities, with no credit value, will supplement the proposed curriculum:

- **Internships through the Concordia Institute for Co-operative Education:** All students will have the opportunity to apply to be a member of the Institute and take part in their Undergraduate Co-op Program, Career Edge (C. Edge) Program, or Accelerated Career Experience (ACE) Program
- **Summer Internships:** Concordia research institutes (e.g., Concordia Security Research Centre) or industrial partners (e.g., Ericsson, Hydro-Québec) can provide research or industry internships. Some professors will also hire undergraduate interns via the Mitacs Accelerate program. NSERC Undergraduate Student Research Awards and Concordia Undergraduate Student Research Awards will also be offered to students who are interested in research focused internships.

6.3 Program oversight

6.3.1 Leadership and composition of the Program Committee

For the proposed program, the Curriculum Committee will be led by an Undergraduate Program Director and consist of 6 members, two faculty representatives from each participating department (CIISE, CSSE, and ECE), a student representative and a part-time faculty representative. The Curriculum Committee will be responsible for academic oversight of the AI program structure and content; reviewing and recommending curriculum changes, new course proposals, and program revisions; ensuring coherence, academic rigor, and alignment with accreditation standards; monitoring course sequencing, prerequisites, and learning outcomes; coordinating and consulting on curriculum changes with the relevant departments; and overseeing the continuous improvement process.

6.3.2 Study Regulations

Students enrolled in the proposed program will be subject to the Academic Regulations defined by the university (Section 16 of the UC) and by the GCS (Section 71.10.4 of the UC), both available online.

6.3.3 Collaborative Arrangements with other Units, Departments, Faculties, and Institutions

The **Concordia Institute for Information Systems Engineering (CIISE)** is actively engaged with other departments, faculties, and research centers within the institution. All these established relationships will contribute to the vitality of the BSc. CIISE professors regularly teach courses in the Departments of Electrical and Computer Engineering, Computer Science and Software Engineering at both undergraduate and graduate levels. For instance, Prof. Chadi Assi, Prof. Honghao Fu, Prof. Arash Mohammadi, Prof. Chun Wang, and Prof. Jun Yan teach offerings of COEN 231 Introduction to Discrete Mathematics. Prof. Glitho also teaches ENCS 691 in the Department of Computer Science and Software Engineering. Professor Amr Yousef and Mohammed Mannan also teach SOEN courses in the Department of Computer Science and Software Engineering. CIISE professors also teach service courses, valuable to the faculty as a whole. These include ENCS courses taught by Prof. Walter Lucia and Prof. Mohsen Ghafouri. We expect that our faculty members will continue to teach undergraduate level courses in other departments.

Professor Mourad Debbabi is the director of the Security Research Centre, a multi-disciplinary center with 18 full members from six departments with diverse interests. The research center facilitates the interaction of security related

researchers across departments, which will also provide critical resources in terms of teaching staff, research facilities, laboratories, and collaborations with industry partners.

Shared supervision of graduate students commonly occurs with the Department of Computer Science and Software Engineering (CSSE) and the Department of Electrical and Computer Engineering (ECE). CIISE professors also independently supervise students in other departments, including the above-mentioned departments, the Department of Building, Civil, and Environmental Engineering (BCEE), and Mechanical and Industrial Engineering.

The **Department of Electrical and Computer Engineering (ECE)** offers three distinct undergraduate programs: the BEng in Electrical Engineering, the BEng in Computer Engineering, and the BEng in Aerospace Engineering Option C-Avionics and Aerospace Systems. Together, these programs provide students with a strong foundation in the technologies that power modern society, from intelligent computing systems and advanced electronics to energy systems and aerospace applications.

The Computer Engineering program lies at the heart of the information revolution and its continuing transformation of society. It prepares students to design and develop the hardware and software systems that support today's digital world. Areas of specialization include computer programming, computer architecture, software systems engineering, embedded systems, digital electronics, digital circuits, very-large-scale integrated (VLSI) circuit design, layout and testing, digital circuit testing and reliability, digital communications, and computer networks. The program also includes elective groups in Software and System Design as well as Computer Science and Programming, featuring courses offered by the Department of Computer Science and Software Engineering. In addition, students may choose electives in Biological and Biomedical Engineering, including courses offered jointly with the Department of Biology in the Faculty of Arts and Science. Many Computer Engineering courses are also taught by faculty affiliated with the Concordia Institute for Information Systems Engineering (CIISE), further enriching the interdisciplinary nature of the program.

The Electrical Engineering program focuses on the generation, conversion, transmission, and intelligent use of energy and information in the most efficient and reliable ways. The field covers a broad range of topics, including electronics, integrated circuit and VLSI design, circuit layout and testing, control systems, robotics, telecommunications, signal processing, power and control systems, electromagnetics, antennas, and optoelectronics. Students in Electrical Engineering may take elective courses offered through L'Institut en génie de l'énergie électrique, a consortium established in 2001 through a joint initiative of Hydro-Québec and founding industrial and university partners to support specialized training in electric energy engineering. Its original industrial partners included Hydro-Québec, ABB, ALSTOM, Dessau-Soprin, Siemens, SNC-Lavalin, and the AIEQ, while its university partners included Polytechnique Montréal, École de téchnologie supérieure, Concordia University, Université Laval, McGill University, and Université de Sherbrooke. Moreover, similar to Computer Engineering, students in the Electrical Engineering program may choose electives in Biological and Biomedical Engineering, including courses offered jointly with the Department of Biology in the Faculty of Arts and Science.

The BEng in Aerospace Engineering is offered jointly with the Department of Mechanical, Industrial and Aerospace Engineering. This program is concerned with the engineering science that governs the design, construction, and operation of aircraft and spacecraft. Aerospace systems rely heavily on electrical and computer engineering, particularly in areas such as avionics, navigation systems, communication networks, and flight control systems. The Aerospace Engineering Option C – Avionics and Aerospace Systems include core courses drawn from both the Computer Engineering and Electrical Engineering programs. In addition, many Aerospace courses are available to students in both the Electrical Engineering and Computer Engineering programs through elective offerings in Controls, Robotics, and Avionics, highlighting the close integration of these disciplines.

The **Department of Computer Science and Software Engineering (CSSE)** offers a suite of collaborative academic programs designed to bridge computing with complementary disciplines and broaden students' intellectual and professional horizons. Through three Joint Major programs -- Computer Science in Health and Life Sciences, Computation Arts and Computer Science, and Data Science -- students gain interdisciplinary expertise by engaging with partner departments and faculties across the university. These programs blend a strong foundation in computer science

with specialized knowledge in biology and the life sciences, fine arts, or mathematics, depending on the chosen path, and each program resides jointly within CSSE and its collaborating department/faculty. In addition, CSSE offers a Minor in Computer Science, enabling students from other fields to develop essential computational skills that enhance their primary area of study and expand their career opportunities. Together, these offerings reflect CSSE's commitment to interdisciplinary education and to preparing graduates to innovate, collaborate, and excel in diverse domains.

Computer Science in Health and Life Sciences: The Bachelor of/Baccalaureate in Computer Science in Health and Life Sciences is offered in collaboration with the Department of Biology in the Faculty of Arts and Science. This program resides in both Faculties. In the Gina Cody School of Engineering and Computer Science, it is offered under the aegis of the Bachelor of/Baccalaureate in Computer Science (BCompSc). The BCompSc in Health and Life Sciences provides students with the unique mix of interdisciplinary knowledge and skills needed to work at the boundary of computing and health and life sciences. Research and development in this field often spans biochemistry and biology as well as computing and engineering. It is essential that students gain sufficient knowledge of the theory, application and language of all the relevant fields to be able to work in interdisciplinary teams to investigate scientific and technical questions, solve problems, use and develop tools and techniques, and communicate effectively. Drawing from students with different backgrounds but with aptitudes for both biology and computing, this interdisciplinary program focuses on scholarship that extends beyond traditional boundaries and prepares the graduates to work in the diverse fields of health and life sciences.

Computation Arts and Computer Science: The Bachelor of/Baccalaureate in Computation Arts and Computer Science is offered in collaboration with the Faculty of Fine Arts and Science. It provides a comprehensive education in computer science and a complementary set of courses of equivalent value in the fine arts. This program resides in both Faculties. In CSSE, it is offered under the aegis of the Bachelor of/Baccalaureate in Computer Science (BCompSc). According to their preferences and aspirations, students may apply either for a Bachelor of/Baccalaureate in Computer Science program, or a Bachelor of/Baccalaureate in Fine Arts program.

Data Science: The Bachelor of/Baccalaureate in Data Science is a program of study which combines a comprehensive education in computer science and mathematics. This program resides in both the Gina Cody School of Engineering and Computer Science and the Faculty of Arts and Science. In the Gina Cody School of Engineering and Computer Science, it is offered under the aegis of the Bachelor of/Baccalaureate in Computer Science (BCompSc). According to their preferences and aspirations, students may apply either for a Bachelor of/Baccalaureate in Computer Science program, Bachelor of/Baccalaureate in Science program, or Bachelor of/Baccalaureate in Arts program.

Minor in Computer Science. The Minor in Computer Science is designed to meet the growing demand for computer-literate professionals and may offer students more career opportunities after graduation. This minor must be combined with a major, specialization or honours program outside of the Gina Cody School of Engineering and Computer Science.

7. PROGRAM STRUCTURE

7.1 Activities

7.1.1. Mandatory and Optional Courses

The proposed degree is a full-time program that consists of 26 courses, corresponding to 90 credits in total, which are allocated to two groups of courses:

- AI Core courses: 72 credits (21 courses)
- AI Electives: 12 credits (3 courses)
- General Education Electives: 6 credits (2 courses): These are courses within the humanities and social sciences

disciplines, listed in Section 71.110 of the Undergraduate Calendar[21]

Table 7.1 provides a list of AI Core courses and Table 7.2 provides a list of available AI Elective courses. Courses with the AI subject code are either existing courses or new courses, indicated in the table. Detailed course syllabi are provided in Appendix 2.

Table 7.1 AI Core courses (72 credits, 21 courses)

Course	Credits	New / Existing
AI 228 System Hardware	4	Existing
AI 231 Discrete Mathematics	3	Existing
AI 233 Mathematics and Statistics for Computer Science	3	Existing
AI 243 Programming Methodology	3.5	Existing
AI 249 Object-Oriented Programming	3.5	Existing
AI 300 Mathematics for AI	3	New
AI 332 Foundations for AI	4	Existing
AI 333 Big Data Analytics	4	Existing
AI 334 Deep Learning	4	Existing
AI 335 Reinforcement Learning	4	New
AI 336 Machine Learning	4	Existing
AI 340 Generative AI	4	New
AI 345 Agentic AI	3	New
AI 346 Operating Systems	4	Existing
AI 350 Computer Architecture for AI	3	New
AI 352 Data Structures and Algorithms	3	Existing
AI 370 AI System Design	3	New
AI 380 Trustworthy and Safe AI	3	New
AI 392 AI and Society	3	New
AI 487 AI and Machine Learning in Cybersecurity	3	Existing
ENCS 282 Technical Writing and Communication	3	Existing

Table 7.2 AI Elective Courses (12 credits, 3 courses)

Courses	Credits	New / Existing
AI Hardware and Intelligent Systems		
AI 401 Edge AI	4	New
AI 411 AI Hardware Accelerators	4	New
AI 412 AI for Wearable Health Applications	4	New
AI 421 Cloud Vector Database Systems for AI	4	New
AI 424 Optimization for Machine Learning	4	New
AI 441 Machine Learning Operations (MLOps)	4	New
AI 442 Explainable AI Engineering Process and Validation	4	New
AI 443 Embodied AI	4	New
AI Software		
AI 434 Distributed Learning	4	Existing
AI 436 Deep Learning for Computational Pathology	4	Existing
AI 449 Machine Learning Theory	4	Existing

[21] https://www.concordia.ca/academics/undergraduate/calendar/current/section-71-gina-cody-school-of-engineering-and-computer-science/section-71-110-complementary-studies-for-engineering-and-computer-science-students.html

AI 459 AI for Media and Content Delivery Networks	4	Existing
AI 469 Conversational Artificial Intelligence	4	Existing
AI 470 Engineering AI-Based Software Systems	4	New
AI 472 Generative AI for Software Engineering	4	Existing
AI 474 AI-Driven Software Improvement and Repair	4	Existing
Cybersecurity for AI		
AI 415 Hardware Security for AI Systems	4	Existing
AI 425 Resilient AI in Safety-Critical Applications	4	New
General / Other Electives		
AI 431 Cloud AI and Distributed ML	4	New
AI 432 Robot Learning	4	New
AI 454 Quantum Machine Learning	4	New

7.1.2. Description of Activities and Evaluation Methods

- **Coursework:** The courses favour a blended learning format and include, whenever possible, in-class work and discussions solving practical problems, and teamwork (projects & presentations). Experts from the industry may be invited to present specific topics.
- **Laboratories:** Our AI laboratory component is a critical aspect of the program, providing students with hands-on experience in the development and deployment of artificial intelligence systems. Through the use of modern AI frameworks and computing platforms, students will engage in laboratory exercises and practical projects that reflect real-world AI applications. The laboratories will reinforce key concepts covered in the core courses and emphasize the practical implementation of machine learning and AI techniques. Students will develop essential skills in areas such as data processing and analysis, machine learning model development, deep learning frameworks, AI system integration, model evaluation and optimization, and deployment on modern computing platforms including GPUs and cloud infrastructures. This practical experience will prepare students to design, implement, and evaluate AI solutions in a variety of application domains. Upon graduation, students will be well equipped to enter the workforce and contribute to the development of innovative and responsible AI technologies.
- **Special activities:** During the summer, students can engage in special activities to earn industry certification, gain work experience, or work in research in one of Concordia's research centres.

For more information about the course evaluation methods, please refer to the course outlines in Appendix 2.

7.2 Pedagogical approaches

7.2.1. Combined theoretical and practical training

All the courses in the degree program will have in-person lectures discussing the relevant theory. In these lectures, the theoretical principles underlying the core AI concepts will be discussed in detail. The application of these principles will be demonstrated through problem-solving. Problem-solving skills will be further developed by problem-set assignments.

To bridge the gap between theory and practice, many of the core courses in the degree program will have a project component in which students will apply their theoretical knowledge to solve industrially relevant problems. These projects will be carried out in teams to foster teamwork and collaboration, and to enhance the communication and leadership skills of the students. Students will be responsible for identifying a critical need/problem in the industry or a societal need in applicable courses. They will conduct appropriate experimentation/analysis and draw conclusions using their practitioner's judgment. Students will present and discuss their findings and participate in evaluating the work of other teams.

7.2.2. Hands-on laboratory training

Hands-on laboratory training is a key component of our BSc AI program, providing students with practical experience in applying theoretical concepts to real-world AI applications scenarios. Our laboratory sessions are designed to reinforce

key concepts covered in the core courses and will emphasize problem-solving and achieving specific objectives. Students will have access to advanced equipment and tools, including high-performance GPU-based clusters “Speed” and Viryia” using remote connections. We will incorporate emerging AI technologies and trends into our lab sessions to ensure that our students are up to date with the latest advancements in AI systems design and deployment.

Our hands-on laboratory training is led by not only specialized AI faculty members but also experienced professionals who bring industry expertise and real-world experience to the classroom. This practical experience will be invaluable in preparing students for the dynamic and ever-changing field of AI. Upon graduation, students will have the practical skills and knowledge necessary to enter the workforce and contribute to the development and deployment of cutting-edge AI-enabled systems.

7.2.3. Innovation in Teaching and Learning

Innovation in teaching and learning is crucial for our BSc in AI program, given the rapidly changing landscape of AI technologies. We are committed to providing our students with cutting-edge education that prepares them to address the latest AI challenges. To achieve this goal, we have implemented various innovative teaching and learning strategies such as project-based learning and flipped classrooms. These strategies are designed to engage students actively, promote critical thinking, and enhance problem-solving skills. Our program also utilizes online resources, open educational resources, and multimedia tools to enhance student learning and accessibility. Additionally, we provide students with opportunities to participate in AI software development competitions, hackathons, and internships to apply their skills and knowledge to real-world scenarios. By utilizing innovative teaching and learning strategies, we aim to produce AI professionals who are well-equipped to address the ever-changing AI landscape.

7.2.4. Work-Integrated learning

Concordia University offers a variety of structured work-integrated learning programs through the Institute for Co-operative Education. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work in the field. Among the different modalities offered, the Co-op program is the longest-standing and the most popular. Students admitted to the Co-op program will alternate between study terms and three internships with three different employers. The program integrates academic studies with program-relevant work experiences in a progressive manner, giving students the opportunity to transfer knowledge and skills between work and classroom settings.

Students can apply to Co-op by completing the appropriate section on the University Admission form. Admission to the program is based on academic performance and a few other factors. Students can also apply to Co-op after being enrolled in the program as long as they have a minimum of 90 credits remaining.

The proposed BSc in AI will open the Co-op and the C-Edge programs to its students. Both programs will be optional upon the launch of the new program, but a clear pathway and ample support will be provided to students enrolled in those programs. There is a possibility of making C-Edge (one internship) mandatory a few years down the road when enrollments are steady and connections with employers are well established.

<u>Other Experiential Learning (EL) Opportunities</u>

Like students enrolled in any other program at Concordia University, students in the proposed new program will benefit from the following experiential learning and professional development offerings provided by the university to expand their hands-on and professional learning opportunities.

Concordia offers six types of experiential learning opportunities: course-integrated, work-integrated, research-based, community-based, international, and student life. Students can search for EL opportunities to participate in by faculty, program, or by type. Career counselors are available to help students explore how different experiential learning opportunities complement different career pathways or their particular career goals. In addition, a personal EL roadmap tool is available to all students, which helps students plan to integrate experiential learning activities into their studies throughout the program.

Concordia has also partnered with Riipen, the world's leading virtual project-based learning platform that connects students with industry and community partners to complete real-world projects for academic credit. Faculty can use Riipen to find real-world projects to use as course assignments and track student progress in real time.

Free professional development courses

Concordia provides students as well as faculty and staff access to more than 4000 free online courses from Udemy covering virtually all disciplines. AI students can find courses that help them solidify prerequisite knowledge, enhance their current studies within the curriculum, and build professional skills as AI practitioners.

7.3 Typical student path

The proposed degree is a full-time, 3-year program with an optional co-op stream. Table 7.3 below shows a sample program pathway for students enrolled in the co-op program with a September entry.

Table 7.3 Study/Work Sequence for the Co-op Program (September Entry)

Year	Fall	Winter	Summer
1	Study	Study	Study
2	Work Term 1	Study	Work Term 2
3	Study	Work Term 3	Study

The core courses in AI will be offered in multiple semesters (Fall, Winter, Summer) as needed to accommodate the needs of students in both the regular and the co-op programs. For a detailed mapping of all courses to academic semesters for regular and co-op and students, see the pathways and course sequences provided in the following pages for September Entry - Regular, and September Entry – Co-op.

Proportion of practical versus theoretical activities

The proportion of practical versus theoretical activities is 45% practical versus 55% theoretical. The practical activities correspond to the tutorial and laboratory hours. There is a large proportion of practical activities compared to theoretical activities, showing that the program has a strong experiential learning component. Note that this does not include the optional experiential learning opportunities such as the Co-op program, E-Edge, or ACE.

Table 7.4 Typical Course Sequence (Fall Term Entry)

Year 1: Fall term		**credits**	**prerequisites / co-requisites**
AI 231	Discrete Mathematics	3.0	P: MATH 204
AI 233	Probability and Statistics for Computer Science	3.0	P: MATH 205
AI 243	Programming Methodology	3.5	P: MATH 204
ENCS 282	Technical Writing and Communication	3.0	P: EWT or ENCS 272
Gen Ed	General Education Elective Course	3.0	
	term total	**15.5**	
Year 1: Winter term		**credits**	**prerequisites / co-requisites**
AI 228	System Hardware	4.0	P: MATH 203 and 204
AI 249	Object-Oriented Programming	3.5	P: AI 243; MATH 203 | C: MATH 205
AI 392	AI and Society	3.0	P: ENCS 282
Gen Ed	General Education Elective Course	3.0	
	term total	**13.5**	
Year 2: Fall term		**credits**	**prerequisites / co-requisites**
AI 300	Mathematics for AI	3.0	P: AI 231, AI 249
AI 332	Foundations for AI	4.0	P: AI 249
AI 352	Data Structures and Algorithms	3.0	P: AI 231, AI 249

TECH ELEC	Technical Elective Course	4.0	
	term total	**14.0**	
Year 2: Winter term		**credits**	**prerequisites / co-requisites**
AI 336	Machine Learning	3.0	P: AI 332
AI 333	Big Data Analytics	4.0	P: AI 352
AI 334	Deep Learning	4.0	P: AI 332
AI 346	Operating Systems	4.0	P: AI 228; AI 352
	term total	**15.0**	
Year 3: Fall term		**credits**	**prerequisites / co-requisites**
AI 335	Reinforcement Learning	4.0	P: AI 332, AI 334
AI 340	Generative AI	4.0	P: AI 334
AI 350	Computer Architecture for AI	3.0	P: AI 228, AI 300, AI 332
AI 370	AI System Design	3.0	P: AI 332, AI 334
	term total	**14.0**	
Year 3: Winter term		**credits**	**prerequisites / co-requisites**
AI 345	Agentic AI	3.0	P: AI 340
AI 380	Trustworthy and Safe AI	3.0	P: AI 332 | C: AI 370
AI 487	AI and Machine Learning in Cybersecurity	3.0	P: AI 300
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
	term total	**17.0**	

Table 7.5 Typical Course Sequence – Co-op (Fall Term Entry)

Year 1: Fall term		**credits**	**prerequisites / co-requisites**
AI 231	Discrete Mathematics	3.0	P: MATH 204
AI 233	Probability and Statistics for Computer Science	3.0	P: MATH 205
AI 243	Programming Methodology	3.5	P: MATH 204
ENCS 282	Technical Writing and Communication	3.0	P: EWT or ENCS 272
Gen Ed	General Education Elective Course	3.0	
	term total	**15.5**	
Year 1: Winter term			
AI 228	System Hardware	4.0	P: MATH 203 and 204
AI 249	Object-Oriented Programming	3.5	P: AI 243; MATH 203 | C: MATH 205
AI 392	AI and Society	3.0	P: ENCS 282
Gen Ed	General Education Elective Course	3.0	
	term total	**13.5**	
Year 1: Summer term			
AI 300	Mathematics for AI	3.0	P: AI 231, AI 249
AI 332	Foundations for AI	4.0	P: AI 249
AI 352	Data Structures and Algorithms	3.0	P: AI 231, AI 249
TECH ELEC	Technical Elective Course	4.0	
	term total	**14.0**	
Year 2: Fall term - Work term			
WORK TERM 1			
Year 2: Winter term			
AI 333	Big Data Analytics	4.0	P: AI 352
AI 334	Deep Learning	4.0	P: AI 332
AI 336	Machine Learning	3.0	P: AI 332
AI 346	Operating Systems	4.0	P: AI 228; AI 352
	term total	**15.0**	

Year 2: Summer term - Work term			
WORK TERM 2			
Year 3: Fall term			
AI 335	Reinforcement Learning	4.0	P: AI 332, AI 334
AI 340	Generative AI	4.0	P: AI 334
AI 350	Computer Architecture for AI	3.0	P: AI, 228, AI 300, AI 332
AI 370	AI System Design	3.0	P: AI 332, AI 334
	term total	**14.0**	
Year 3: Winter term: Work Term			
WORK TERM 3			
Year 3: Summer term		**credits**	**prerequisites / co-requisites**
AI 345	Agentic AI	3.0	P: AI 340
AI 380	Trustworthy and Safe AI	3.0	P: AI 332 | C: AI 370
AI 487	AI and Machine Learning in Cybersecurity	3.0	P: AI 300
TECH ELEC	Technical Elective Course	4.0	
TECH ELEC	Technical Elective Course	4.0	
	term total	**17.0**	

7.4 Feedback and evaluation

A description of the feedback and evaluation of the co-operative education program is given in Section 7.4.1. There is no research component of the program.

7.4.1. Feedback and Evaluation Processes for the Co-operative Format

The Institute for Co-operative Education offers a number of work-integrated learning opportunities to students in the GCS. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. It provides students with the opportunity to combine study with paid work terms in their chosen fields.

The academic content is identical to that of the regular programs with three work terms interspersed with study terms. However, in order to continue their studies in the co-operative format in the GCS, or to graduate from one of its programs as members of the Institute for Co-operative Education, students must satisfy the following conditions:

i. must be in acceptable standing and maintain a cumulative grade point average (CGPA) of at least 2.50 in their program (the CGPA is calculated in the manner described in Section 16.3.10 Academic Performance under Section 16.3 Evaluation, Administrative Notations, Examinations, and Performance Requirements);
ii. be assigned a grade of pass for each of the three work-term courses (CWTE or CWTC). Under certain conditions, students may be placed on co-op probation status;
iii. remain in their designated work study sequence. Any deviations must have prior approval by the director of the Institute for Co-operative Education in consultation with the co-op program director in their department.

<u>Regulations for Work Terms</u>

- Successful completion of the work terms shown in the Co-op Schedule indicated in Section 24 Institute for Co-operative Education is a prerequisite for graduation as a member of the Institute for Co-operative Education.
- Work-term job descriptions are screened by the co-op coordinator. Only jobs approved by the Institute for Co-operative Education will be accepted as being suitable for the work-term requirements.
- Work-term jobs are full-time employment normally for a minimum of 12 consecutive weeks (14 to 16 weeks, preferably).
- A work-term report must be submitted each work term on a subject related to the student's employment. This report must be submitted to the Institute for Co-operative Education on or before the deadline shown in Section 24 Institute for Co-operative Education. Grammar and content of work-term reports are evaluated by the Institute for Co-operative Education and the technical aspects are evaluated by the co-op program director responsible. Evidence of the student's ability to gather material relating to the job, analyze it effectively, and present it in a clear, logical, and concise form is required in the report.

- The required communication component consists of an oral presentation on a technical subject taken from the student's work environment. The presentation will be given on campus in a formal setting after students have returned to their study term. A written summary is also required. Guidelines for the preparation of this oral presentation are provided in the Co-op Student Handbook.
- Work terms will be evaluated for satisfactory completion. Assessment is based upon the employer evaluation of performance, the work-term report, graded by the Academic Director, and communication component which together constitute the job performance as related to the whole work term. Students must pass all required components. The grade of pass or fail will be assigned to each of the work-term courses. A failing grade will result in the student's withdrawal from the Institute for Co-operative Education.

Student Demand and Enrolment

All students will be able to apply for the Co-op program. Those who are not admitted to the Co-op program can enroll in the Career Edge program. Every student who wishes to have an internship will have the opportunity to enroll in the Career Edge program.

7.5 Alignment of activities, skills and program objectives

The Computer Science Accreditation Council (CSAC) defines attributes required of students graduating from computer science, software engineering and interdisciplinary programs, most of which correspond to the graduate attributes that are required for CEAB-accredited programs. To align the outcomes assessment of courses in both the B.Eng. in AI Engineering and B.Sc. in AI, the curriculum for the B.Sc. in AI has been mapped using the CSAC attributes. The courses proposed for the undergraduate BSc in AI program are linked to 8 attributes and the level at which the attribute is learned or demonstrated (introduce, develop, apply) in a particular course.

Table 7.5: Curriculum mapping showing alignment of graduate attributes, indicators, and courses

Graduate attribute:	**Demonstrate knowledge**		
Definition:	Competently apply knowledge in a) software engineering, b) algorithms and data structures, c) systems software, d) computer elements and architectures, e) theoretical foundations of computing, f) discrete mathematics and g) probability and statistics.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
Knowledge in mathematics (e.g., discrete mathematics, probabiliy and statistics)	Introductory	Identify appropriate techniques for solving mathematical problems	Introductory-level knowledge from CEGEP Math courses is expected
	Developed / Intermediate	Apply knowledge to systems problems	AI 231 Discrete Mathematics AI 300 Mathematics for AI
	Applied / Advanced	Adapt math knowledge to computing and AI problems; Evaluate and validate results; Show in-depth understanding of university-level mathematics	AI 333 Big Data Analytics
Knowledge in AI (including software engineering, algorithms and data structures, systems software, computer elements and architectures, theoretical foundations of computing)	Introductory	Remember solution techniques; Identify appropriate technique for tackling AI problems	AI 228 System Hardware AI 243 Programming Methodology
	Developed / Intermediate	Apply techniques to AI systems problems	AI 231 Discrete Mathematics AI 249 Object-Oriented Programming AI 332 Foundations for AI AI 333 Big Data Analytics AI 334 Deep Learning AI 335 Reinforcement Learning AI 340 Generative AI AI 346 Operating Systems AI 352 Data Structures and Algorithms AI 392 AI and Society

	Applied / Advanced	Combine multiple methods for tackling system problems; Evaluate and validate results; Show in-depth understanding of AI knowledge	AI 336 Machine Learning AI 345 Agentic AI AI 350 Computer Architecture for AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity

Graduate attribute:	**Analyse and solve problems**		
Definition:	Use appropriate knowledge and skills, including background research and experimentation, to identify, investigate, abstract, conceptualize, analyse, and solve complex computing problems, in order to reach substantiated conclusions.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
Problem identification and formulation	Introductory	Explain/describe the problem; Explain given information and ideas; Identify missing information; Formulate by recalling similar example	AI 228 System Hardware AI 243 Programming Methodology ELEC 275 Principles of Electrical Engineering ENGR 213 Applied Ordinary Differential Equations
	Developed / Intermediate	Interpret unknowns and ambiguities; Draw connections among ideas; Examine all facts to produce new solutions; Generalize the formulations from examples already seen	AI 300 Mathematics for AI AI 332 Foundations for AI AI 334 Deep Learning AI 335 Reinforcement Learning AI 370 AI System Design AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Justify and defend solutions; Formulate / produce new solutions based on supporting evidence	AI 336 Machine Learning AI 352 Data Structures and Algorithms
Modelling	Introductory	Identify parameters and variables from a problem statement; Recall existing models for the similar problems	AI 228 System Hardware AI 243 Programming Methodology AI 300 Mathematics for AI ELEC 275 Principles of Electrical Engineering ENGR 213 Applied Ordinary Differential Equations
	Developed / Intermediate	Compare modelling strategies: Logical-Mathematical models vs. Physical Models; Draw valid assumptions	AI 332 Foundations of AI AI 333 Big Data Analytics AI 335 Reinforcement Learning AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Weigh limitations, barriers and opportunities; Evaluate assumptions to formulate a prototype	AI 336 Machine Learning AI 345 Agentic AI AI 352 Data Structures and Algorithms
Problem solving	Introductory	Identify methods to solve the problem; Select the right method to solve the problem	AI 228 System Hardware AI 243 Programming Methodology
	Developed / Intermediate	Interpret problem for a special case; Test solutions using computer programs and computer simulation; Solve problem by making educated guesses	AI 300 Mathematics for AI AI 332 Foundations for AI AI 335 Reinforcement Learning AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Evaluate the problem for general cases; Justify and verify solutions	AI 336 Machine Learning AI 345 Agentic AI AI 352 Data Structures and Algorithms AI 380 Trustworthy and Safe AI
Analysis	Introductory	Identify elements of uncertainty; Identify patterns; Describe the knowledge acquired from the experience	AI 228 System Hardware AI 243 Programming Methodology

	Developed / Intermediate	Relate a given problem to similar problems; Reorganize a problem by splitting it into sub-parts; Distinguish / Calculate range of expected inputs and outputs; Interpret results of analysis, degree of accuracy; Distinguish and choose between different alternatives	AI 332 Foundations for AI AI 333 Big Data Analytics AI 335 Reinforcement Learning AI 370 AI System Design AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Weigh a model to simplify it and remove unnecessary details; Develop / derive new facts; Evaluate and justify a chosen solution based on criteria	AI 336 Machine Learning AI 350 Computer Architecture for AI AI 352 Data Structures and Algorithms AI 380 Trustworthy and Safe AI
Designing and conducting experiments	Introductory	Comprehend randomness; Choose instruments and testing method; Demonstrate understanding of concepts of reproducibility, accuracy, feasibility, cost, size; Identify the available tools for conducting experiments and collecting data; Demonstrate the knowledge for using tools; Report all data objectively	AI 332 Foundations for AI
	Developed / Intermediate	Avoid bias; Consider limitations of equipment; Discuss issue of materials vs. measurements; Discuss difficulty of duplication; Consider variability / operator error; Discuss random sampling; Debate safety issues; Discuss ethical issues including obtaining appropriate permissions if experiments involve humans	AI 336 Machine Learning
	Applied / Advanced	Design a controlled experiment;	AI 350 Computer Architecture for AI
Collecting, analyzing and interpretation of data	Introductory	Aware of mathematical tools required for data analysis	AI 332 Foundations for AI
	Developed / Intermediate	Use methods from probability and statistics to analyze and interpret data; Match experimental results with theory; Synthesize information to arrive at substantiated conclusions	AI 336 Machine Learning
	Applied / Advanced	Develop strategies to analyze / capture the performance of engineering syste; Validate assumptions; Discuss what went wrong / error analysis	AI 350 Computer Architecture for AI AI 380 Trustworthy and Safe AI

Graduate attribute:	**Design software and systems**		
Definition:	Design and evaluate solutions for complex open-ended computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, as well as economic, cultural, societal, and environmental considerations.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
Define the objective	Introductory	Consult / discuss with client; Gather information; Describe the problem; Define client objectives	AI 228 System Hardware
	Developed / Intermediate	Analyze social and environmental needs; Examine prior solutions; Evaluate benchmark solutions available in the market	AI 332 Foundations for AI AI 346 Operating Systems
	Applied / Advanced	Evaluate future societal / corporation needs and technologies	AI 336 Machine Learning AI 345 Agentic AI
Idea generation and selection	Introductory	Identify exiting solutions that would satisfy the requirements / expectations of the design; Identify the required technology to satisfy the needs of given design	AI 228 System Hardware
	Developed / Intermediate	Define features / capabilities to be evaluated; Define conceptual alternatives; Discuss how each feature satisfies the client's needs	AI 332 Foundations for AI AI 334 Deep Learning AI 335 Reinforcement Learning AI 346 Operating Systems

	Applied / Advanced	Critique alternative solutions; Create new, unique, untried solutions; Develop ideas outside the box; Weigh solutions using techniques such as brainstorming and lateral thinking; Select appropriate solutions using decision grids or force-field analysis	AI 345 Agentic AI
Detailed design	Introductory	Describe a complex solution that allows implementation	AI 228 System Hardware AI 249 Object-Oriented Programming
	Developed / Intermediate	Relate and synthesize solutions to sub-problems; Demonstrate / show details; Adapt the best available solution for the given design challenge	AI 332 Foundations for AI AI 334 Deep Learning AI 370 AI System Design
	Applied / Advanced	Validate/ substantiate solutions	AI 336 Machine Learning
Validation and implementation	Introductory	Describe the required methodology / tools for validation; Select the right methodology for validation and implementation	AI 228 System Hardware
	Developed / Intermediate	Question / check for accuracy	AI 249 Object-Oriented Programming AI 332 Foundations for AI AI 334 Deep Learning AI 346 Operating Systems AI 370 AI System Design
	Applied / Advanced	Validate design against specs (does it meet all requirements, e.g., cost, efficiency, codes, etc.?); Weigh solution against multiple, objective criteria of evaluation; Defend the originality of the design	AI 336 Machine Learning AI 345 Agentic AI

Graduate attribute:	**Use appropriate resources**		
Definition:	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of their strengths and limitations.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
Ability to use appropriate tools, techniques and resources	Introductory	Describes the experiment	AI 228 System Hardware AI 300 Mathematics for AI
	Developed / Intermediate	Use library tools with accuracy and precision; Demonstrate the usage of tools in lab environment; Show competence in using various engineering software; Show competence in understanding of experiments	AI 249 Object-Oriented Programming AI 334 Deep Learning AI 335 Reinforcement Learning AI 340 Generative AI AI 370 AI System Design
	Applied / Advanced	Improve the capabilities of tools	AI 345 Agentic AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity
Ability to select appropriate tools, techniques, and resources	Introductory	Demonstrate knowledge of / awareness of standards	AI 300 Mathematics for AI
	Developed / Intermediate	Compare the capabilities of different tools	AI 332 Foundations for AI AI 335 Reinforcement Learning AI 340 Generative AI AI 390 AI Engineering Design Project
	Applied / Advanced	Select appropriate technical documentation; Evaluate suitability of the tools for the task; In labs, choose the right tools / techniques for problem; In projects, demonstrate ability to select appropriate tools and techniques	AI 336 Machine Learning AI 345 Agentic AI AI 380 Trustworthy and Safe AI AI 487 AI and ML in Cybersecurity
Demonstrate awareness of limitations of tools, create and extend tools as necessary	Introductory	Demonstrate awareness of limitations of tools	AI 228 System Hardware
	Developed / Intermediate	Address limitations of given tools by extending tools and combining tools	AI 335 Reinforcement Learning AI 340 Generative AI
	Applied / Advanced	Address limitations of given tools by creating new tools; Weigh limitations of given tools by choosing different tools	AI 345 Agentic AI AI 350 Computer Architecture for AI AI 487 AI and ML in Cybersecurity

Graduate attribute:	Work individually and in a team		
Definition:	Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
Cooperation and work ethics	Introductory	Understand the expectations of team members; Assist teammates when needed	AI 228 System Hardware
	Developed / Intermediate	Actively participating in meetings; Communicate within the team; Cooperate within the team; Demonstrate flexibility to adapt changing conditions	AI 332 Foundations for AI AI 390 AI Engineering Design Project AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Respect team-mates; Recognize teammates who need support; Provide feedback on team members' contributions; Volunteer for tasks	AI 336 Machine Learning
Contribution: practical/conceptual	Introductory	Identify the knowledge/skills required to make impact on team projects; Provide timely and quality feedback on the assigned tasks	AI 228 System Hardware
	Developed / Intermediate	Recognize the need for research and gathering information; Recognize the accountability of an individual member for the submitted teamwork; Demonstrate technical and professional engineering skills throughout the team-work; Assess the quality of the work	AI 332 Foundations for AI AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Suggest ideas; Write reports or section of reports; Provide constructive feedback on the report(s) or presentations; Contribute to the presentation	AI 336 Machine Learning
Initiative and leadership	Introductory	Recognize your own strengths that would make positive impact on the team	AI 228 System Hardware
	Developed / Intermediate	Identify teammates' strengths that would make positive impact on the team	AI 332 Foundations for AI AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Assess contribution as measured by peer-evaluation; Demonstrates leadership and initiative; Supports shared leadership; Judge the quality of the work delivered; Recognize unprofessional behaviors in teams and select the appropriate tools to intervene	AI 336 Machine Learning
Team dynamics	Introductory	Awareness of his/her role in the group; Recognize conflict in teamwork; Understand the importance of accountability and reliability in team dynamics	AI 228 System Hardware
	Developed / Intermediate	Identify differences among group members that cause uncontrollable working environment; Suggest strategies to manage conflict	AI 332 Foundations for AI AI 487 AI and ML in Cybersecurity
	Applied / Advanced	Overcome conflict and ensure the continuity of work in teams in the future; Foresee future conflicts and avoid them in a professional manner	AI 336 Machine Learning

Graduate attribute:	Communicate effectively		
Definition:	Communicate with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**

Writing process	Introductory	Identify communicative purposes; Identify audience needs and level of knowledge; Identify task requirements through active listening; Frame supportable, significant theses and arguments; Draft and revise for organization, clarity, and adherence to requirements	ENCS 282 Technical Writing and Communication
	Applied / Advanced	Give and respond to critical feedback; Adapt content, form, and style to respond to different communicative situations	AI 487 AI and ML in Cybersecurity
Information gathering	Introductory	Identify document types; Maintain complete and accurate records of sources; Formulate search strategies; Employ effective search techniques for electronic databases and library resources	ENCS 282 Technical Writing and Communication
	Applied / Advanced	Evaluate quality and usefulness of sources	AI 487 AI and ML in Cybersecurity
Documentation	Introductory	Select document type (genre) appropriate for communicative situation; Produce a complete written document with content that is clearly understood by the audience; Paraphrase and/or summarize information; Attribute source materials through proper in-text citation and referencing; Represent engineering concepts visually	ENCS 282 Technical Writing and Communication
	Applied / Advanced	Synthesize and/or evaluate source materials; Produce documents that can be certified by professional engineers	AI 487 AI and ML in Cybersecurity
Oral presentation	Introductory	Identify audience needs, interests, and level of knowledge; Convey information orally within allocated timeframes; Select appropriate visual and audio media and tools to maintain audience attention; Establish appropriate scope for treatment of topic in oral presentation; Plan and incorporate visual materials; Utilize effective oral delivery techniques; Appreciate questions and queries from audiences	ENCS 282 Technical Writing and Communication
	Applied / Advanced	Adapt presentation to heterogeneous audiences; Evaluate the effectiveness of presentations; Show awareness of liability associated with engineering statements and recommendations	AI 487 AI and ML in Cybersecurity

Graduate attribute:	**Act professionally**		
Definition:	Act appropriately with respect to ethical, societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and with regard to the consequential responsibilities relevant to professional computing practice.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
PR-1. Role and responsibilities of AI professionals	Introductory	Describe and appredíate the role of AI professionals in society, especially in Quebec and Canada; Demonstrate a good understanding of liability in Quebec's legal system	ENCS 282 Technical Writing and Communication
	Applied / Advanced	Differentiate between professional and personal roles; Distinguish between dimensions of responsibility - moral, legal & social; Apply responsibility in professional context; Assess situations of professionalism in case studies; Demonstrate professionalism in open-ended team projects	AI 392 AI and Society

PR-2. Professional practice	Introductory	Identify legal issues on occupational safety and intellectual property; Identify values associated with professional practice; Identify relevant professional standards	ENCS 282 Technical Writing and Communication
	Applied / Advanced	Communicate through accepted professional means; Apply relevant professional standards; Adapt values of professional practice in the work environment	AI 380 Trustworthy and Safe AI AI 392 AI and Society

Graduate attribute:	**Be prepared for life-long learning**		
Definition:	Learn new tools, computer languages, technologies, techniques, standards and practices, as well as be able to identify and address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.		
Indicators	**Learning level**	**Learning objectives**	**Learning activities / courses**
Identifying missing knowledge and learning opportunities	N/A	Identify available sources for self-learning; Able to identify new or advanced fields / opportunities in his engineering discipline; Know his / her shortcomings to tackle a challenge; Can make educated predictions for the future technological and scientific advancements	AI 487 AI and ML in Cybersecurity Technical electives
Continuous improvement and self-learning	N/A	Self-acquire necessary information from different sources; Assess a new problem and identify the knowledge necessary to solve it	AI 487 AI and ML in Cybersecurity Technical electives

Specific knowledge, expertise, skills (learning outcomes) which students will acquire

By the end of this program, successful students will be able to do the following:

Knowledge

1. Understanding of sciences related to AI:
    - Mathematics
    - Computer science
    - Computer engineering
    - Electrical engineering
    - Software engineering
2. Understanding of the fundamentals of AI:
    - Mathematics for AI
    - Machine Learning Foundations
    - Deep Learning and Representation Learning
    - Programming
    - Data Engineering for AI
    - Computing Systems and infrastructure
    - AI model deployment and MLOps
    - Optimisation and Efficient AI
    - Trustworthy and Responsible AI
    - Security for AI
    - AI tools
    - AI Applications and Systems Integration

Skills and abilities

1. Non-technical skills and abilities
    - Critical thinking (structured analysis, research literature, evaluation, conclusion)

- Problem-solving (problem definition, brainstorming, planning, evaluation)
- Communication skills (written, oral, active listening, presentation)
- Teamwork (planning and organization, conflict resolution)

2. Technical skills and abilities
    - Knowledge of **operating systems** (Linux, Windows) and their role in supporting AI frameworks and computing environments
    - Understanding of **computer architecture and parallel computing platforms** used for AI workloads (CPUs, GPUs, and AI accelerators)
    - Experience with **programming languages commonly used in AI development** (e.g., Python, C/C++, and numerical computing libraries)
    - Familiarity with **machine learning and deep learning frameworks** (e.g., PyTorch, TensorFlow, or similar tools)
    - Knowledge of **data processing, data management, and feature engineering techniques** used in AI pipelines
    - Understanding of **model training, evaluation, and validation methodologies** in machine learning systems
    - Ability to **develop, test, and optimize machine learning models** for different applications and datasets
    - Experience with **software engineering practices for AI systems**, including version control, testing, and modular design
    - Familiarity with **distributed and cloud computing platforms** used for training and deploying AI models
    - Knowledge of **model optimization techniques**, such as quantization, pruning, and efficient inference methods
    - Understanding of **AI system deployment and lifecycle management**, including monitoring and model updates
    - Familiarity with **data privacy, fairness, and responsible AI principles** in the development of intelligent systems
    - Experience with **containerization and virtualization technologies** (e.g., Docker and similar tools) to support reproducible AI workflows

8. SUPPORT FOR STUDENT SUCCESS

8.1 Financial support

There are various sources of funding available to support the students. Below is a non-exhaustive list of applicable financial support programs to the BEng in AI Engineering and BSc in AI students:

University-wide sources of funding:

- Concordia Council on Student Life Special Project Funding
- Concordia Student Union (CSU)
- Grants for Religious and Spiritual Groups
- QPIRG Discretionary Fund
- Sustainability Action Fund
- FundOne (crowdfunding platform)
- Scholarships, bursaries and awards:
    - Concordia University Undergraduate Entrance Scholarship Program
    - Concordia University Undergraduate Entrance Bursary Program
    - Concordia University Undergraduate In-Course Scholarship Program
    - Concordia University Undergraduate In-Course Bursary Program
    - Concordia Awards
- External Awards
- Undergraduate Student Research Awards Program (NSERC-USRA competition)

- Funding administered by Concordia International (Quebec Mobility Bursary, Erasmus+, Mitacs Globalink Research Award)

Scholarships, bursaries and awards for Engineering and Computer Science students:

- Ahema Award
- André Desmarais Golf Classic Scholarship – GCS
- Campaign For A New Millennium ENCS Scholarship
- Dean M.N.S Swamy Engineering Scholarship for Indigenous Students
- Dominic Faccone Entrance Scholarship in Engineering and Computer Science
- Experiential Learning Award of Excellence in Engineering and Computer Science
- Fariborz and Roya Haghighat Entrance Scholarship in Engineering
- François Plourde Scholarships for Women in Engineering
- Genium360 Awards for Women in Engineering in Student Groups
- Gerald, Maria, and Georginia Daoussis Scholarship
- Gina Cody School Dean's Entrance Scholarship
- Gina Cody School EDI Shuffle Award
- Gina Cody School of Engineering and Computer Science Student Life Award
- Gina Cody School Shuffle Scholarship
- Gina Cody School Women In Engineering Entrance Award
- Groupe LGS Inc. Scholarships in Engineering
- Indigo Consulting Scholarship in Computer Science and Software Engineering
- Jaan Saber, Phoivos Ziogas Memorial Scholarship
- Jack Bordan Engrance Scholarship in Engineering and Computer Science
- Jae Saleh Student Life Award in Engineering
- James McQueen Scholarship
- John N. Economides Scholarship in Engineering and Computer Science
- Joseph and Gabriella Pataki Scholarship for International Female Students in Engineering
- Katalis Award
- Knowledge First Foundation Entrance Excellence Scholarship in Engineering and Computer Science
- Marie and Bob Baird Entrance Scholarship
- Miriam Sobel Award
- Nabil Esmail Undergraduate Excellence in Engineering Scholarship
- NDT Technologies Inc. Scholarship for Engineering and Computer Science
- Normand D. Hebert Entrance Scholarship
- Petrogiannis Family Award for Women in Engineering
- Richard Laurence Weldon Scholarship
- Robert Walsh Entrance Scholarship in Engineering and Computer Science
- Velan Scholarships for Women in Engineering

8.2 Student Services

There are a variety of student services, workshops, and events offered by various offices at Concordia, the Gina Cody School of Engineering and Computer Science, and various student associations. Below is a non-exhaustive list of these services:

- Admission advising
- Academic advising and support
- First-year support counselling
- Orientation sessions
- Immigration advising

- Departmental student events and workshops
- Student Success Centre: Tutoring, skill development, and career planning
- First Stop: Kiosks located in the main buildings around campus where students are directed to appropriate supports or services.
- Student Service Station: Weekly on-line drop-in with academic advisors and staff
- Welcome Crew Mentors
- Birks Students Centre
- IT Support
- Heath and wellness: Medical care clinic and mental health support
- Study help and tutoring (writing assistance, math tutoring, learning specialists)
- Research support and skills development workshops for undergraduates
- Financial and budgeting support and workshops
- Residences and food and housing services and support
- Career counselling and advising
- Career planning
- Career events and job fairs
- Student association events
- Capstone Poster Day

Related offices:

- Access Centre for Students with Disabilities
- Advocacy Office
- ASFA Student Life Volunteer Pool
- Birks Student Centre
- Campus Security
- Career Advising and Professional Success
- Career Counselling and Educational Transitions
- Student Parents Centre
- Dean of Students
- Financial Aid and Awards Office
- Health Services Clinic
- Housing and Job Resource Centre
- International Students Office
- IT support (AITS)
- Multi-Faith and Spirituality Centre
- NouLa Black Student Centre
- Student Academic Services
- Student Success Centre
- Otsenhákta Student Centre

8.3 Academic and student life

There are various opportunities for students to be involved in the community and in associations within the university.

Concordia groups and initiatives related to community involvement

- **4th Space**
  A public space on campus that serves as a gateway to research and learning activities at Concordia, where researchers can engage the public in experiential learning.
- **Multi-faith and Spirituality Centre**

A home on campus for all those who wish to celebrate the human spirit, open to all students whether spiritual, secular or religious.

- **Centre for Gender Advocacy**
  An independent, student-funded organization mandated to promote gender equality and empowerment particularly as it relates to marginalized communities.
- **Centre for Creative Reuse**
  CUCCR is dedicated to diverting materials from inside Concordia's waste-stream and offering them to the general community free of cost.
- **D3 Innovation Hub**
  Center for Innovation and Entrepreneurship that provides the necessary tools, resources and knowledge to move from idea to impact with confidence.
- **SHIFT Centre for Social Transformation**
  Supports existing and emerging social transformation initiatives that unite with the goal of creating a more just, inclusive and broadly prosperous Montreal.
- **Sustainability Hub**
  Promoting sustainability-related initiatives, tools, resources, research, funds and programs to the Concordia community.
- **Otsenhákta Student Centre**
  An on-campus resource for First Nations, Métis and Inuit students to find community, plan social events and access resources to help them achieve academic success.
- **University of the Streets Café**
  A program that organizes bilingual public conversations in cafés and community spaces across Montreal.
- **Zero Waste**
  An initiative focused on reducing waste on campus and encouraging the Concordia community to reduce, reuse, recycle and rot.
- **NouLa Black Student Centre**
  Offers resources, services, and programming for Concordia students from Black communities and supports Black students' success and wellness.
- **Espace Franco**
  A place for French-speaking students to connect with other French-speaking students who are pursuing post-secondary studies in English for the first time.
- **Office of Community Engagement**
  Connecting faculty, staff and students with members of the wider Montreal community in order to build meaningful relationships.
- **Queer Concordia**
  An on-campus resource centre for queer, lesbian, gay, trans, two-spirited, bisexual, asexual, intersex, questioning and allies.
- **Homeroom**
  A virtual place for new undergraduate students to connect and navigate the university experience together.

Engineering and Computer Science student associations relevant to the B.Eng. in AI Engineering and B.Sc. in AI

- ECA (Engineering and Computer Science Association)
- ECSGA (Engineering and Computer Science Graduate Association)
- GCES (Gina Cody School Entrepreneurship Society)
- EngGames (Engineering Games – Concordia University)
- Hack Concordia
- Space Concordia
- SCS (Software Engineering and Computer Science Society)
- Women in Engineering

Concordia University student associations (selected)
There are 90-100 Concordia University student associations related to culture, nation, ethnicity, politics, athletics, hobbies, and various interests. The following is a representative list of groups that may be of interest to B.Eng. in AI Engineering and B.Sc. in AI students.

- Concordia Student Union (umbrella association)
- ACSiON Concordia (for students from the African diaspora)
- African Students Association of Concordia
- Arab Student Network
- Artificial Intelligence Society Concordia
- Ascend Concordia (cultivating leadership and professional growth)
- Best Buddies
- Biomedical Engineering Club
- Black Students Career Development
- Brazilian Student Association (BRASA) Concordia
- Climbing Club
- Concordia Canadian Asian Society
- Concordia Debate Society
- Concordia Game Development
- Concordia Games Club
- Concordia Outdoors Club
- Concordia Student Exchange Association
- Concordia Students Recreational Sports Club
- Egyptian Students' Association
- Electrocon (electronic music)
- Filipino Organization of Concordia University Students
- FINDAC (education on the intersection between finance and data science)
- Google Developer Student Club
- Haitian Students at Concordia
- Heart for Africa (humanitarian)
- Intervarsity at Concordia
- Lebanese Student Association
- MEDLIFE Concordia (trips to underserved regions)
- NanoStride (making AI accessible)
- North African Student Society
- Pakistani Cultural Club
- Palestinian Cultural Club
- Quantitative Research and Competitions Club (QUARCC)
- Running Club Montreal
- Stronger Than Stigma Concordia (overcoming social barriers related to mental health)
- Student Music Club
- Syrian Students Association
- The Concordian (media)
- The Filmmaking Club
- United for Literacy
- Vietnamese Concordia Association

9. RESOURCES

9.1 Faculty Resources

9.1.1. Current Faculty

Full-Time Faculty Members (CSSE):
Batmaz, Anil Ufuk, Dr., Assistant Professor (UB)
Belilovsky, Eugene, Dr., Associate Professor (EB)
Benharref, Abdelghani, Dr., Lecturer (AB)
Bentaleb, Abdelhak, Dr., Assistant Professor, (AB)
Bergler, Sabine, Dr., Professor (SB)
Cespedes, Sandra, Dr., Assistant Professor (SC)
Chen, Tse-Hsun, Dr., Associate Professor (THC)
Constantinides, Constantinos, Dr., Associate Professor (CC)
Costa, Diego, Dr., Assistant Professor, (DC)
Dangel, Felix, Dr., Assistant Professor (FD)
Dargham, Joumana, Dr., Senior Lecturer (JD)
Desai, Bipin, Dr., Professor (BD)
Dohmatob, Elvis, Dr., Assistant Professor (ED)
Eavis, Todd, Dr., Associate Professor (TE)
Fevens, Thomas Gordon, Dr., Professor (TF)
Glatard, Tristan, Dr., Professor (TG)
Goswami, Dhrubajioti, Dr., Associate Professor (DG)
Grahne, Gosta, Dr., Professor (GG)
Gueheneuc, Yann-Gael, Dr., Professor (YG)
Hajjdiab, Hassan, Dr., Lecturer (HH)
Hanna, Aiman, Dr., Teaching Professor (AH)
Harutyunyan, Hovhannes H., Dr., Professor (HHH)
Hosseini, Mahdi, Dr., Assistant Professor (MH)
Houari, Nora, Dr., Senior Lecturer (NH)
Jafarpour, Hamed, Dr., Lecturer (HJ)
Jannatpour, Ali, Dr., Lecturer (AJ)
Jaumard, Brigitte, Dr., Professor (BJ)
Jayakumar, Rajagopalan, Dr., Associate Professor (RJ)
Kersten-Oertel, Marta, Dr., Associate Professor (MKO)
Kosseim, Leila, Dr., Professor (LK)
Krzyzak, Adam, Dr., Professor (AK)
Lovitz, Benjamin, Dr., Assistant Professor (BL)
Mansour, Essam, Dr., Associate Professor (EM)
Mellah, Hakim, Dr., Lecturer (HM)
Mendhurwar, Kaustubha, Dr., Senior Lecturer (KM)
Morales Alvarado, Rodrigo, Dr., Lecturer (RMA)
Mudur, Sudhir, Dr., Professor (SM)
Narayanan, Lata, Dr., Professor (LN)
Pankratov, Denis, Dr., Associate Professor (DP)
Paquet, Joey, Dr., Associate Professor (JP)
Popa, Tiberiu, Dr., Associate Professor (TP)
Poullis, Charalambos, Dr., Professor (CP)
Probst, David, Dr., Associate Professor (DP)
Ravanelli, Mirco, Dr., Assistant Professor (MR)
Rilling, Juergen, Dr., Professor (JR)
Rigby, Peter, Dr., Professor (PR)
Shihab, Emad, Dr., Professor, (ES)

Shiri-Varnaamkhaasti, Nematollaah, Dr., Associate Professor (NS)
Suen, Ching Y., Dr., Professor (CS)
Tan, Shin Hwei, Dr., Associate Professor (SHT)
Tsantalis, Nikolaos, Dr., Professor (NT)
Xiao, Yiming, Dr., Associate Professor (YX)
Yan, Yuhong, Dr., Associate Professor (YY)
Yang, Jinqiu, Dr., Associate Professor (JY)
Wang, Yang, Dr., Associate Professor (YW)
Zhijie Wang, Dr., Assistant Professor (ZW)

Full-Time Faculty Members (ECE):

Agarwal, Anjali, Dr., Professor (AG)
Aghdam, Amir G., Dr., Professor (AA)
Ahmad, M. Omair, Dr., Professor (OA)
Ait Mohamed, Otmane, Dr., Professor (OM)
Bali, Ahmed, Dr., Lecturer (AB)
Benali, Habib, Dr., Professor (HB)
Cai, Jun, Dr., Professor (JC)
Chouchen, Moataz, Dr., Assistant Professor (MC)
Coutinho, Rodolfo W.L., Dr., Associate Professor (RC)
Cowan, Glenn, Dr., Professor (GC)
Goodarzi, Bahareh, Dr., Senior Lecturer (BG)
Hamou-Lhadj, Abdelwahab, Dr., Professor (AH)
Hashtrudi Zad, Shahin, Dr., Associate Professor (SH)
Kharma, Nawwaf, Dr., Professor (NK)
Khendek, Ferhat, Dr., Professor (FK)
Khorasani, Kash, Dr., Professor (KK)
Lago, Paula, Dr., Assistant Professor (PL)
Le Beux, Sébastien, Dr., Associate Professor (SL)
Liu, Yan, Dr., Professor (YL)
Lynch, William E., Dr., Professor (WL)
Mehmet Ali, Mustafa K., Dr., Professor (MM)
Qiu, Dongyu, Dr., Associate Professor (DQ)
Rezanejad, Morteza, Dr., Assistant Professor (MR)
Rivaz, Hassan, Dr., Professor (HR)
Rodrigues, Luis, Dr., Professor (LR)
Skonieczny, Krzysztof, Dr., Professor (KS)
Soleymani, M. Reza, Dr., Professor (RS)
Tahar, Sofiène, Dr., Professor (ST)
Trueman, Christopher W., Dr., Professor (CT)
Wang, Chunyan, Dr., Professor (CW)
Zhang, Gengrui (Edward), Dr., Assistant Professor (GZ)
Zhu, Wei-Ping, Dr., Professor (WZ)
Zuo, Xinxin, Dr., Assistant Professor (XZ)

Full-Time Faculty Members (CIISE):

Amayri, Manar, Dr., Assistant Professor (MA)
Assi, Chadi, Dr., Professor (CA)
Awasthi, Anjali, Dr., Professor (AnA)
Ayub, Ali, Dr., Assistant Professor (AiA)
Basyouni, Ayda, Dr., Senior Lecturer (AB)
Ben Hamza, Abdessamad, Dr., Professor (ABH)
Bentahar, Jamal, Dr., Professor (JB)

Bouguila, Nizar, Dr., Professor (NB)
Clark, Jeremy, Dr., Associate Professor (JC)
Debbabi, Mourad, Dr., Professor (MD)
Dssouli, Rachida, Dr., Professor (RD)
Fu, Honghao, Dr., Assistant Professor (HF)
Fung, Carol, Dr., Associate Professor (CF)
Ghafouri, Mohsen, Dr., Associate Professor (MG)
Glitho, Roch, Dr., Professor (RG)
Hammad, Amin, Dr., Professor (AmH)
Lucia, Walter, Dr., Associate Professor (WL)
Majumdar, Suryadipta, Dr., Associate Professor (SuM)
Mannan, Mohammad, Dr., Professor (MM)
Mohammadi, Arash, Dr., Associate Professor (AM)
Naderkhani, Farnoosh, Dr., Associate Professor (FN)
Patterson, Zachary, Dr., Professor (ZP)
Schiffauerova, Andrea, Dr., Professor (AS)
Wang, Chun, Dr., Professor (CW)
Yan, Jun, Dr., Associate Professor (JY)
Youssef, Amr, Dr., Professor (AY)
Zeng, Yong, Dr., Professor (YZ)

Please see Appendix 5 for the CVs of current faculty members. Table 9.1 below demonstrates the ability of the faculty to teach the planned AI courses in this program.

Table 9.1. Faculty Teaching Capabilities

Course Codes	Course Titles	Professor Initials	# of profs
CORE COURSES			
AI 228	System Hardware	CIISE: AB, AY, CA, CF, HM, IP, JC, JY, LW, MM, MP, RD, SeM, SuM, TE | CSSE: AB, AG, OA, SF, SL | ECE: AA, AB, GC, OA, RS, SL, ST	27
AI 231	Discrete Mathematics	CIISE: HF | ECE: AG, JC, RS, SH | CSSE: AJ, AK, BJ, DP, GG, HH, LN, SB	13
AI 243	Programming Methodology	CIISE: HF | ECE: AB, AH, BG, FK, GZ, MC, MM, NK, PL, YL, XZ | CSSE: AB, AH, AJ, DC, HH, HJ, HM, KM, NH	21
AI 249	Object-Oriented Programming	CIISE: AB, AY, JC, MM, SeM, SuM | CSSE: AB, AH, AJ, DC, HH, HJ, HM, KM, NH | ECE: AB, AH, BG, FK, GZ, MC, NK, PL, MM, YL, XZ	26
AI 300	Mathematics for AI	CIISE: ABH | CSSE: EB, ED, FD, MH, MR, YX | ECE: HR, MC	9
AI 332	Foundations of AI	CSSE: EB, ED, FD, LK, MH, MR, SB, YX | ECE: AB, AH, HB, HR, KK, KS, MR, MZ, PL, XZ, YL	19
AI 333	Big Data Analytics	CIISE: AB, ABH, AiH, AlA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, LW, MA, MD, MG, MM, MP, NB, RD, RG, SeM, SuM, WL, YZ, ZP | CSSE: EM, TG | ECE: GZ, YL	32
AI 334	Deep Learning	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: EB, ED, FD, MH, MR, YX | ECE: AB, AH, AO, GZ, HB, HR, KK, KS, MC, MR, NK, PL, WZ , XZ, YL	37

AI 335	Reinforcement Learning	CIISE: AB, AiH, AlA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, YZ | CSSE: EB, ED, FD, MR | ECE: KK, KS, MR	30
AI 336	Machine Learning	CSSE: LK, SB, ED, MR, EB, FD, MH, YX | ECE: AB, AH, HB, HR, KK, KS, MR, MZ, PL, XZ, YL	19
AI 340	Generative AI	CSSE: DC, EB, ED, ES, FD, MH, MR, YX, ZW | ECE: AB, MR, YL	12
AI 345	Agentic AI	CIISE: AB, ABH, AiH, AlA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, WL | CSSE: DC, ES, JY, PR, THC, ZW | ECE: AB, MR, YL	33
AI 346	Operating Systems	CIISE: AB, AY, JC, LW, MD, RD, SeM, SuM | CSSE: AH, AJ, DG | ECE: BG, FK, GZ, PL, AH	16
AI 350	AI-Centric Computer Architecture	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | ECE: AB, OA, SF, SL	20
AI 352	Data Structures and Algorithms	CIISE : AB, AiH, AlA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: AH, AJ, DC, DG, DG, HM, TF, TP | ECE: AB, AH, BG, CR, FK, GZ, MC, NK, PL, YL, XZ	37
AI 370	AI System Design	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: DC, ES, JY, PR, THC, ZW | ECE: AH, MC, YL	25
AI 380	Trustworthy and Safe AI	CIISE: AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM | CSSE: DC, ES, JY, PR, THC | ECE: XZ, YL	23
AI 487	AI and Machine Learning in Cybersecurity	CIISE: AB, ABH, AiH, AlA, AM, AY, CA, CF, IP, JB, JC, JY, MA, MD, MM, MP, RD, RG, SeM, SuM	20
TECHNICAL ELECTIVES			
AI Software			
AI 434	Distributed Learning	CSSE: EB | ECE: GZ	2
AI 436	Deep Learning for Computational Pathology	CSSE: MH	1
AI 449	Machine Learning Theory	CSSE: EB, ED, FD, MR	4
AI 459	AI for Media and Content Delivery Networks	CIISE: AB, SC	2
AI 469	Conversational Artificial Intelligence	CSSE: AB, SC	2
AI 470	Engineering AI-Based Software Systems	CSSE: DC, ES, JY, PR, TH	5
AI 472	Generative AI for Software Engineering	CSSE: DC, PR, JY, THC | ECE: AH, MC	6
AI 474	AI-Driven Software Improvement and Repair	CSSE: JY, PR, THC | ECE: AH, MC	5
Cybersecurity for AI			
AI 415	Hardware Security for AI Systems	CIISE: AM, JY, MG, WL	4
AI 425	Resilient AI in Safety-Critical Applications	CIISE: JY, MG, SuM	3
AI Hardware and Intelligent Systems			
AI 401	Edge AI	ECE: AB, OA, SL, ST	4

AI 411	AI Hardware Accelerators	ECE: AB, OA, SL, ST	4
AI 412	AI for Wearable Health Applications	ECE: HB, HR, MR, PL	4
AI 421	Cloud Vector Database Systems for AI	ECE: GZ, YL	2
AI 424	Optimization for Machine Learning	ECE: AG, KK, LR	3
AI 441	MLOps: Machine Learning Operations	ECE: AH, MC, YL	3
AI 442	Explainable AI Engineering Process and Validation	ECE: YL	1
AI 443	Embodied AI	ECE: KS, XZ	2
Other / General			
AI 431	Cloud AI and Distributed ML	CIISE: AiA	1
AI 432	Robot Learning	CIISE: AiA, AM	2
AI 454	Quantum Machine Learning	CIISE: HF| CSSE: BL | ECE: RS	3

9.1.2. Faculty Hiring Plan

In Year 0, we will need to select an Undergraduate Program Director from either CIISE, CSSE or ECE with a remission of 1.5 credits to handle the launch of the program. In year 1, this course remission will increase to 3.0 credits per year for handling the operations and curriculum management tasks. In year 1, the Program Director will be assigned the task of interfacing with the Institute for Co-operative Education for the students who are enrolled in the various internship options (Co-op program, C-Edge, ACE), also receiving a course remission of 1.5 credits per year.

Currently, CIISE, CSSE, and ECE bring together a substantial cohort of faculty members with expertise in artificial intelligence and closely related areas, providing strong support for the proposed program. In addition, as shown in Table 9.1 many existing faculty members can also teach fundamental mathematics, computer science, and computer engineering courses in the proposed curriculum. By carefully examining the potential teaching capacity of CIISE, CSSE, and ECE faculty members and their existing teaching load, we determined that existing faculty members can take 50 sessions a year for the newly proposed BSc AI Program. In this case, we don't require any additional tenure-track faculty positions for this program. In year 1, one ETA is to be made available at the commencement of full program operations. From Year 2 onwards, we require an additional ETA to accommodate the increased course load in each of the two years. In the following, we explain how the required resources can be used to cover the course sessions required by the program.

Table 9.2 shows the number of course sessions needed for a regular typical course sequence (without co-op option) for the first four years of the program. In this sequence each course will only be offered once per year. However, this is not sufficient to support co-op options and it does not provide the flexibility for some students who could not follow the typical sequence due to various reasons. In addition, we also need to reserve the capacity for students registered in the proposed AI BSc program. Therefore, as shown in Table 9.3, for core AI courses, we have decided to offer two sessions a year. This way we can provide sufficient sessions to cover the need for co-op options and provide higher capacity for additional students and more flexibility for students who need an alternative sequence.

Table 9.2 Number of sessions needed (Typical Course Sequence)

	AI Core	AI Electives
Year 1	5	1
Year 2	7	1
Year 3	7	2

Table 9.3 Number of sessions needed to cover co-op and provide higher capacity and more flexibility

	AI Core	AI Electives
Year 1	10	1
Year 2	14	1
Year 3	14	2

Table 9.4 Accumulative Load and Resources Required

	AI Core	AI Electives
Year 1	10	1
	TT (4 Sessions) + 1 ETA (7 sessions) + TA (1400 H)	
Year 2	24	2
	TT (12 Sessions) + 2 ETA (14 sessions) + TA (2600 H)	
Year 3	38	4
	TT (28 Sessions) + 2 ETA (14 sessions) + TA (4200 H)	

Based on the updated course load in Table 9.3, the accumulative course sessions needed for each of the first four years and the resources needed to cover the load are as shown in Table 9.4. In Year 1 of the program, 1 ETA is needed to cover 7 sessions of BSc AI Core and AI Elective courses, and a total of 4 sessions will be taught by existing faculty members. In Year 2 of the program, 2 ETAs are needed to cover 14 sessions of BSc AI Core and Elective courses, and a total of 12 sessions will be taught by existing faculty members. In Year 3 of the program, 2 ETAs are needed to cover 14 sessions of BSc AI Core and AI Elective courses, and a total of 28 sessions will be taught by existing faculty members. The program will reach its full and regular load in Year 3.

9.1.3. Support Measures for Teaching

The Centre for Teaching and Learning (CTL) at Concordia University provides new and existing faculty members with a wide range of pedagogical and professional development support, from course design, lesson planning, teaching and assessment strategies, instructional technologies, online or blending learning, inclusive teaching practice, student engagement to course evaluations and the teaching dossier. The support is offered in various formats, from web resources, e-learning modules, and one-on-one teaching consultation to various programming offerings and events such as workshops, webinars, New Faculty Orientation, Winterfest (teaching and learning festivals), and special projects.

CTL web resources

The CTL website houses an abundance of teaching and learning resources created or curated by the CTL staff[22]. The content is constantly updated to reflect the current needs of instructors teaching at Concordia as well as to keep abreast of recent trends in faculty development in higher education. New faculty will find the website especially helpful in quickly identifying different kinds of teaching support available to them.

Teaching Academy eLearning modules

The Teaching Academy eLearning modules developed by the CTL in collaboration with eConcordia are dedicated to promoting teaching excellence and continuous professional development for faculty[23]. The topics are divided into modules and further segmented into micro-modules. The content in each module and micro-module both stands alone and clearly links to related topics, allowing instructors to quickly learn some strategies to meet a particular need as well as follow a learning path to systematically improve certain facets or areas in their teaching practice, such as assessment in general. Like the CTL website, Teaching Academy is also public-facing and freely available to instructors.

[22] https://www.concordia.ca/ctl.html

[23] https://teachingacademy.concordia.ca/

New Faculty Orientation

Faculty new hires are invited to participate in the annual CTL New Faculty Orientation that usually takes place in August. The event introduces new faculty members to various pedagogical support and services available to them and helps them kick-start their teaching career at Concordia by encouraging them to think about what teaching means and what it takes to be an effective teacher.

Workshop and webinars

Faculty members are advised to check the Event section of the CTL website regularly, especially before the start of a new term. The CTL offers workshops and webinars throughout an academic term, esp. in August, September, December, and January. The Fall and Winter semester workshop and webinar information and registration links are usually sent to departments as well, which will, in turn, be shared with all instructors[24].

Teaching consultation

New faculty members are encouraged to book consultations with Teaching Consultants at the CTL, who can meet with instructors to provide advice, support, and resources on a wide variety of teaching-related topics. Here are some of the most common consultation topics:

1. Reviewing a course syllabus
2. Decolonizing and indigenizing the classroom/curriculum
3. Selecting and implementing the appropriate pedagogical approach, teaching strategies, and techniques, such as: active learning, flipped classroom, group work, class discussions, etc.
4. Classroom management issues
5. Designing assignments and other assessments
6. Grading
7. Selecting the most appropriate technologies
8. Implementing inclusive teaching strategies
9. Lesson planning
10. Preparing a teaching dossier (refer to the Teaching Dossier[25].)
11. Interpreting course evaluations (refer to the Course evaluations[26].)

Teaching observation and feedback

Classroom Observations can be requested by instructors at any stage in their career who are interested in getting feedback on their teaching. The Teaching Consultant regularly observes classes to provide feedback on pedagogy, classroom management, etc.

Once an instructor requests an observation, the Teaching Consultant will be in touch to set up a Pre-Observation meeting to discuss background information and the instructor's specific motivation for the observation. The Teaching Consultant will observe a lecture at a pre-determined time. After the lesson, the instructor completes a reflection, and the Teaching Consultant prepares a confidential report on the lesson. Within one week of the observed lesson, the Teaching Consultant and instructor meet to discuss the lesson and review the report with observations, comments, and suggestions before it is finalized.

Course (Re)Design

If an instructor would like support in developing a new course or revamping an existing course, the CTL can work with individual or a team of instructors to ensure the development of the course follows an evidence-based approach to course design. The CTL can provide support materials and expertise on every aspect of the design of courses as they work together with instructors through each step.

[24] https://www.concordia.ca/ctl/events/workshops.html
[25] https://www.concordia.ca/ctl/professional-development/teaching-dossier/renewal.html
[26] https://www.concordia.ca/ctl/course-design/mid-evaluations.html

Mid-course feedback

Mid-course feedback can provide valuable information for making changes in teaching before summative evaluation of a course. A teaching consultant is available to aid with interpretation of responses and offer suggestions for improving teaching effectiveness.

9.2 Administrative and support staff

9.2.1. Current Administrative, Technical and Support Staff

Department	**CIISE**	**CSSE**	**ECE**
Department Administrator	Kimberley Adams	Massy Joulani	Tatyana Bobrova
Assistant to the Director / Chair	TBD	Mary Tzanetakos	Kristin Tedd
Office Assistant	Laura Oproiu	Vanessa Anania	Elvyra Simkute
Undergraduate Program Assistant	TBD	Carly Carruthers Laurel Tidman Vanessa Anania	Gulzat Temirova Sabrina Gendron
Technical Officer	TBD	Alexander Aric	N/A
Technical Specialist	TBD	Nathan Crozier	Chafic Brikho Alexy Voronko Jorris Moreau
Laboratory Coordinator	TBD	Nimalan Yoganathan	Dmitry Rozhdestvenskiy
Engineering Specialist	N/A	N/A	Tadeusz Obuchowicz Shiyu Qin
Engineering in Residence	TBD	N/A	Dmitry Rozhdestvenskiy
Design Project Specialist	N/A	N/A	Bipinkumar Patel

9.2.2. Future Administrative, Technical and Support Staff

At the launch of the program, we request one Undergraduate Program Assistant for the BEng and BSc programs to support program operations including, for example, working with the Undergraduate Program Director in managing the program, taking on the role of answering program related queries from potential and current students, as well as supporting faculty members. The Undergraduate Program Assistant will be first point of contact of students in this new program. The Undergraduate Program Assistant will work in collaborations with the Undergraduate Program Assistants of the three departments. In addition, we are requesting one engineer-in-residence in the second year to handle specific project-based courses in this program.

Table 9.5 Staff Members Hiring Plan

AY	# BSc Students*	Requested Admin	Requested Tech
2027-28	0	-	-
2028-29	50	Programs Assistant	-
2029-30	120	Programs Assistant	Engineer in Residence
2030-31	208	Programs Assistant	Engineer in Residence
2031-32	287	Programs Assistant	Engineer in Residence
2032-33	325	Programs Assistant	Engineer in Residence

**Cohort to grow to 100 in steady state. 10% attrition rate applied. Total enrolments in any given academic year, once a full cohort in all years is achieved, is expected to hover around 325.*

9.3 Material, technological and library resources

9.3.1. Library support and holdings

The Library provides support to both faculty and students in navigating the information ecosystem both broadly. and alongside the transformational changes occurring in this ecosystem because of recent advances in artificial intelligence. As part of its long-standing commitment to information literacy, the Library supports AI literacy across the campus in several ways. It has developed online learning modules for both faculty and students to support baseline foundational knowledge and critical thinking around the use of AI for different types of information tasks. General and discipline-specific workshops are constantly updated to include AI tools (both standalone and those embedded in disciplinary databases and platforms). Guidance on when and how to acknowledge the use of AI in academic and professional contexts is also provided through an extensive online guide. (See the Library's AI Literacy website). The Library also maintains a website to curate AI resources from across the campus, e.g. IITS, CTL, Library, etc. (See the Library's AI Resources Hub)

For engineering professions, technical competence alongside safe and ethical decision-making requires a commitment to information currency and lifelong learning. Methods for following industry trends, research advances, governmental policy, professional standards, etc. are crucial. The Library can support students in their academic work, in their experiential learning placements, and in their ongoing professional lives by introducing environmental scanning methods and resources that will serve them while at Concordia (licensed resources and tools) and beyond (open resources and tools). Data sources and data management is critical to work in artificial intelligence, and the Library can also provide guidance in finding and managing datasets for academic, research and professional contexts.

The Webster and Vanier libraries provide a variety of group and individual study spaces to support different tasks and needs. In person and online chat options are available for students needing support in finding or using information resources. Course materials chosen by faculty are made available in print or online formats through the Library's Course Reserves system, reducing textbook / coursepack cost barriers for students. The Technology Sandbox and Visualization Studio have specialized hardware and software that may support certain types of student projects.

For the assessment of library holdings (databases, journals, etc.) to support the teaching and learning needs of this new program, see the Concordia University Library Report in Appendix 4.

9.3.2. Classroom space

Classroom space for new AI courses (lectures and tutorials) will be available at the SGW campus for the appropriate enrollments as the course grows and will be assigned through the University.

9.3.3. Laboratory space and equipment

GCS recognizes the importance of hands-on laboratory experience in providing a comprehensive AI education. To support its students in this regard, GCS has developed a range of teaching labs that offer diverse learning opportunities.

Several dedicated teaching labs are located on the 8th and 9th floor of the Hall building and are used by CIISE/CSSE/ECE students enrolled in several courses for hands-on laboratories. It is anticipated that the programs can be established with relatively minor capital injections through regular capital project competitions at Concordia University. This assumes an annual intake of about 100 new students in BEng in AI Engineering program and 100 new students in BSc in AI program so that, with attrition, the total number of students in both programs will be around 600. If the intake significantly exceeds 100 students per year in each program, additional lab space and larger classrooms will be needed.

The AI-specialized components will be designed as virtual labs accessible from the existing CIISE/CSSE/ECE teaching facilities, requiring no additional lab space physically. They will be either built as portable platforms that can be handily installed/uninstalled in the Hall building teaching labs, or as (co-)simulated modules hosted on existing CIISE/CSSE/ECE computing infrastructures (e.g., the "Speed" and "Viryia" computer clusters) and remotely accessible from computers in the Hall building teaching labs, GCS general labs, and/or student's personal laptops.

APPENDICES

Appendix 1:	Official description of the program
Appendix 2:	Course outlines and descriptions
Appendix 3:	Needs Analysis, Surveys, Market Analysis, Environmental Scans
Appendix 4:	Library Report
Appendix 5:	Faculty CVs
Appendix 6:	List of external persons consulted in the preparation of the program proposal
Appendix 7:	Full detailed program expenses and revenues

Summary of Changes (New Undergraduate Program (Regular Process))

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
AI 233 Probability and Statistics for Computer Science	★	★	★	★	★	★	★	★	★	★
AI 332 Foundations for AI	★	★	★	★	★	★	★	★	★	★
AI 336 Machine Learning	★	★	★	★	★	★	★	★	★	★

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
General Education Electives: BSc in AI	★	★	★
Artificial Intelligence Core	★	★	★
Artificial Intelligence Electives	★	★	★
AI Hardware and Intelligent Systems Electives	★	★	
AI Software Electives	★	★	
Cybersecurity for AI Electives	★	★	
General AI Technical Electives	★	★	

Regulation Changes:

- BSc in AI Degree Requirements

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: Degree Requirements
Calendar Section Type: Regulation
Description of Change: BSc in AI Degree Requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence)

Present Text calendar	Proposed Text
	Degree Requirements The BSc in Artificial Intelligence consists of the Artificial Intelligence Core and Artificial Intelligence Electives as shown below. The minimum length of the program is 90 credits.

Rationale:

Resource Implications:

D1

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: BSc in Artificial Intelligence
Calendar Section Type: Program
Description of Change: BSc in AI - requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science
Program Name: BSc in Artificial Intelligence
Program Type: Major
Degree: Major

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements

Type of Change: New Program

Present Text calendar	Proposed Text
credits	**90 credits** BSc in Artificial Intelligence
0	~~0~~ 72 credits from the Artificial Intelligence Core
	12 credits from Artificial Intelligence Electives
	6 credits from General Education Electives: BSc in Artificial Intelligence

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: General Education Electives: BSc in Artificial Intelligence
Calendar Section Type: Defined group
Description of Change: General Education Electives: BSc in AI

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence

Type of Change: New Defined Group

Present Text calendar	Proposed Text
	6 credits General Education Electives: BSc in Artificial Intelligence
0	~~0~~ Students must complete 6 credits from the following: General Education Humanities and Social Sciences Electives

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: Artificial Intelligence Core
Calendar Section Type: Defined group
Description of Change: Artificial Intelligence Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	72 credits	Artificial Intelligence Core
0	~~0~~	AI 228 System Hardware (4) AI 231 Discrete Mathematics (3) AI 233 Probability and Statistics for Computer Science (3) AI 243 Programming Methodology (3.5) AI 249 Object-Oriented Programming (3.5) AI 300 Mathematics for AI (3) AI 332 Foundations for AI (4) AI 333 Big Data Analytics (4) AI 334 Deep Learning (4) AI 335 Reinforcement Learning (4) AI 336 Machine Learning (4) AI 340 Generative Artificial Intelligence (4) AI 345 Agentic AI (3) AI 346 Operating Systems (4) AI 350 Computer Architecture for Artificial Intelligence (3) AI 352 Data Structures and Algorithms (3) AI 370 Artificial Intelligence System Design (3) AI 380 Trustworthy and Safe Artificial Intelligence (3) AI 392 Artificial Intelligence and Society (3) AI 487 Artificial Intelligence and Machine Learning in Cybersecurity (3) ENCS 282 Technical Writing and Communication (3)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: Artificial Intelligence Electives
Calendar Section Type: Defined group
Description of Change: Artificial Intelligence Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	12 credits	Artificial Intelligence Electives
0	~~0~~	Students must complete 12 credits from the Artificial Intelligence Electives listed below. Courses are listed in groups to indicate areas of specialization: AI Hardware and Intelligent Systems Electives AI Software Electives Cybersecurity for AI Electives

Rationale:

Resource Implications:

D6

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: AI Hardware and Intelligent Systems Electives
Calendar Section Type: Defined group
Description of Change: AI Hardware and Intelligent Systems Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence > Artificial Intelligence Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	AI Hardware and Intelligent Systems Electives
0	~~0~~	AI 401 Edge Artificial Intelligence (4) AI 411 Artificial Intelligence Hardware Accelerators (4) AI 412 Artificial Intelligence for Wearable Health Applications (4) AI 421 Cloud Vector Database Systems for Artificial Intelligence (4) AI 424 Optimization for Machine Learning (4) AI 441 MLOps: Machine Learning Operations (4) AI 442 Explainable Artificial Intelligence Engineering Process and Validation (4) AI 443 Embodied Artificial Intelligence (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: AI Software Electives
Calendar Section Type: Defined group
Description of Change: AI Software Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence > Artificial Intelligence Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	AI Software Electives
0	~~0~~	AI 434 Distributed Learning (4) AI 436 Deep Learning for Computational Pathology (4) AI 449 Machine Learning Theory (4) AI 459 Artificial Intelligence for Media and Content Delivery Networks (4) AI 469 Conversational Artificial Intelligence (4) AI 470 Engineering Artificial Intelligence-Based Software Systems (4) AI 472 Generative Artificial Intelligence for Software Engineering (4) AI 474 AI-Driven Software Improvement and Repair (4)

Rationale:

Resource Implications:

D8

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: Cybersecurity for AI Electives
Calendar Section Type: Defined group
Description of Change: Cybersecurity for AI Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence > Artificial Intelligence Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	Cybersecurity for AI Electives
0	~~0~~	AI 415 Hardware Security for Artificial Intelligence Systems (4) AI 425 Resilient Artificial Intelligence in Safety-Critical Applications (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: General AI Technical Electives
Calendar Section Type: Defined group
Description of Change: General AI Technical Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) > Degree Requirements > BSc in Artificial Intelligence > Artificial Intelligence Electives

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	credits	General AI Technical Electives
0	~~0~~	AI 431 Cloud AI and Distributed Machine Learning (4) AI 432 Robot Learning (4) AI 454 Quantum Machine Learning (4)

Rationale:

Resource Implications:

D10

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: AI 233
Calendar Section Type: Course
Description of Change: AI 233 Probability and Statistics for Computer Science

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 233 Probability and Statistics for Computer Science (3 credits) (also listed as COMP 233)
Prerequisites:	*Prerequisites:* The following course must be completed previously: MATH 205 or Cegep Mathematics 203 or NYB.
Description :	*Description :* This course covers the following topics: combinatorics; axioms of probability; conditional probability; discrete and continuous probability distributions; expectation and moments; hypothesis testing' parameter estimation; correlation and linear regression; and applications to computer science.
Component(s):	*Component(s):* Lecture (3 hours per week) ; Tutorial (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 233 may not take this course for credit.

Rationale:

This is a core course in the B.Sc. in AI. An AI subject code is being assigned for an existing course, COMP 233.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: AI 332
Calendar Section Type: Course
Description of Change: AI 332 Foundations for AI

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 332 Foundations for AI (4 credits)
	(also listed as COMP 332)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 249 or COMP 249 .
Description :	*Description :*
	This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence (AI) and Machine Learning (ML), with an emphasis on implementation. Students develop core programming skills and learn to use numerical and tensor libraries to express linear algebra operations and high-performance tensor computations, including indexing, broadcasting, vectorization, and GPU-enabled execution. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue / Singular Value Decomposition (SVD) intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance / correlation, entropy, and Kullback-Leibler (KL) divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train / validation / test methodology, performance metrics, model development, and experiment tracking tools.
Component(s):	*Component(s):*
	Lecture (2.5 hours per week) ; Laboratory (1 hour per week)
Notes :	*Notes :*

Present Text calendar	Proposed Text
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 332 may not take this course for credit.

Rationale:

This is a core course in the B.Sc. in AI. An AI subject code is being assigned for a course being proposed in another dossier (COMP 332), with which AI 332 will be cross-listed.

[Note: A tag must be added for COMP 332 once that course is approved. Dossier ID: GCS-COMP-5982.]

Resource Implications:

None.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)
Dossier Title: BSc in Artificial Intelligence - NEW

Calendar Section Name: AI 336
Calendar Section Type: Course
Description of Change: AI 336 Machine Learning

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Gina Cody School of Engineering and Computer Science

Calendar publication date: 2028/2029/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2028

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.106 Artificial Intelligence > Section 71.106.3 Artificial Intelligence Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	AI 336 Machine Learning (4 credits)
	(as listed as COMP 432)
Prerequisites:	*Prerequisites:*
	The following course must be completed previously: AI 332 or COMP 332 .
Description :	*Description :*
	This course introduces conceptual and practical aspects of machine learning. Concepts include regression, classification, maximum likelihood estimation, discriminative vs. generative modelling, generalization, supervised learning, unsupervised learning, semi-supervised learning and transfer learning. Methods include linear models, mixture models, nearest neighbours, support vector machines, random forests, boosting, and basics of deep learning. A project is required.
Component(s):	*Component(s):*
	Lecture (3 hours per week) ; Laboratory (2 hours per week)
Notes :	*Notes :*
Equivalent Courses :	**Equivalent Courses :** Students who have received credit for COMP 432 may not take this course for credit.

Rationale:
This is a core course in the B.Sc. in AI. An AI subject code is being assigned for an existing course (COMP 432), with which AI 336 will be cross-listed.

Resource Implications:
None.

Impact Report

Programs

BSc in AI - requirements
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements
Source of Impact

Defined Groups

AI Hardware and Intelligent Systems Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements -> BSc in Artificial Intelligence -> Artificial Intelligence Electives
Source of Impact

AI Software Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements -> BSc in Artificial Intelligence -> Artificial Intelligence Electives
Source of Impact

Artificial Intelligence Core
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements -> BSc in Artificial Intelligence
Source of Impact

Artificial Intelligence Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements -> BSc in Artificial Intelligence
Source of Impact

Cybersecurity for AI Electives
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements -> BSc in Artificial Intelligence -> Artificial Intelligence Electives
Source of Impact

General Education Electives: BSc in AI
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.2 Course Requirements (BSc in Artificial Intelligence) -> Degree Requirements -> BSc in Artificial Intelligence
Source of Impact

Courses

AI 233 Probability and Statistics for Computer Science
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 332 Foundations for AI
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

AI 336 Machine Learning
Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.106 Artificial Intelligence -> Section 71.106.3 Artificial Intelligence Courses
Source of Impact

Other Units

Addition of **ENCS 282** to **Artificial Intelligence Core** requirement
Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 249** to **AI 332** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 432** to **AI 336** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 332** to **AI 336** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **General Education Humanities and Social Sciences Electives** to **General Education Electives: BSc in Artificial Intelligence** requirement
Source of other unit Impact

- Defined group is housed in Section 71.110 Complementary Studies for Engineering and Computer Science Students

Addition of **MATH 205** to **AI 233** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **COMP 233** to **AI 233** requirement
Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Appendix 1: Official Program Description

Artificial Intelligence is a science and engineering discipline that applies the principles of engineering and natural sciences to the design, development, and deployment of intelligent systems capable of learning from data, making decisions, and interacting with complex environments. Its focus includes ensuring the reliability, robustness, fairness, transparency, and safety of AI-driven systems across electronic platforms and applications. As an integral component of contemporary life, artificial intelligence has emerged as a rapidly expanding field, reflecting its essential role in transforming digital infrastructure and enabling innovation worldwide.

This program will appeal to students seeking careers such as machine learning specialists, data scientists, and AI systems developers, among others. Graduates of this program will be equipped to contribute to operations, development, planning, and technical support of AI-enabled systems. Given the pervasive nature of artificial intelligence across organizations and industries, AI professionals find employment in sectors such as information technology, healthcare, finance, manufacturing, transportation, and public services. Their training and skills frequently complement those of decision-makers and executives in leveraging data-driven solutions and intelligent systems effectively. As a comprehensive program covering the theoretical and practical foundations of artificial intelligence, the BSc program will also appeal to students intending to pursue graduate studies.

The Artificial Intelligence BSc curriculum integrates core computer science principles with specialized AI topics, enabling students to develop advanced knowledge aligned with their interests and future career paths. These domains include machine learning, deep learning, data science, computer vision, natural language processing, AI systems and infrastructure, trustworthy and explainable AI, and AI applications in cyber-physical systems and emerging technologies.

B.Sc. in AI

Appendix 2:

Course Outlines

AI Core Courses

AI 228 System Hardware (4 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: Please see your class schedule for details

Course Calendar Description:
This course covers the following topics: Boolean Algebra, Digital logic and the design of logic circuits; CPU design; addressing modes; instruction sets and sequencing; design of datapath and control units; memory systems and types; cache memory levels; I/O devices and their interconnection to the CPU; assembly language, and Interrupts.

Components: Lecture 3 hours per week; Tutorial 2 hours per week; Laboratory 2 hours per week

Note: Students who have received credit for COMP 228 or SOEN 228 may not take this course for credit.

Prerequisites: MATH 203 or Cegep Mathematics 103, MATH 204 or Cegep Mathematics 105
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Basic mathematical concepts

Course materials
Required Textbook: N/A
Suggested Textbooks: *Computer Organization and Embedded Systems, 6th edition.* Carl Hamacher, Zvonko Vranesic, Safwat Zaky, and Naraig Manjikian; McGraw-Hill; 2012

In addition to the course web page, the faculty web pages have a wealth of information pertaining to our computer systems and software, which includes simple user guides, and answers to many standard questions. You are encouraged to explore these help pages. Begin your exploration from the URL: http://aits.encs.concordia.ca/helpdesk/faq/faq.php/.

Grading Scheme

Assessment tool	Weight
Midterm examination	35%
Final examination	50%
Labs	15%
Total	100%

Completion of the "Safety 1: From Concept to Culture" course is mandatory for all students. A passing grade in this course is a prerequisite for receiving your final grade in AI 228. The course is available in your Moodle account.

Tentative Course Schedule

Include a week-by-week description of course topics (12-week term). You can include any details you like in the schedule.

Lectures	Book chapters	Suggested questions*
1: Basic structure of computers	Chapter 1	
2: Arithmetic and numbering system	Chapter 9	9.2, 9.4, 9.5, 9.6, 9.13, 9.14, 9.21, 9.22, 9.23, 9.24, 9.31,9.32
3: Boolean algebra and digital logic	Appendix A	A.2-9, 11-17, 19-20, 22-34
4: Instruction set architecture	Chapter 2, Appendix E	2.1-2.23, 2.24-2.33 (optional)
5: Basic processing unit	Chapter 5	5.1-5, 5.9, 5.11-12, 5.14-19, 24-26
6: The memory system	Chapter 8	8.2-13, 8.20-21, 8.25
7: Input / Output	Chapters 3 and 7	7.1-2, 4-10, 13-14, 17, 19, 21

*Suggested questions are for practice. There will not be discussed or answered during the class

Details on assessment tools:

Final exam

The exam is a closed-book exam. The final exam date will be set by the University Administration. The exam will cover material from the entire semester, including lectures, textbook, and tutorials. Passing the final exam is necessary for passing the course. There is no substitution for a missed final exam.

Midterm exam

The exam is a closed-book exam. There is no substitution for a missed exam.

Labs

A total of 3 labs experiments (60%) and one project lab (40%). Complete details about the labs are available on a separate document available on Moodle.

Other information

Include any other relevant information you would like to share with your students here.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3 Knowledge base in a specific domain	Introductory
Problem analysis	PA-1 Problem identification and formulation	Introductory

	PA-2 Modelling PA-3 Problem solving PA-4 Analysis	
Design	DE-1 Define objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Introductory
Use of engineering tools	UET-1 Ability to use appropriate engineering tools and resources	Introductory
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution ITW-3 Initiative and leadership ITW-4 Team dynamics	Introductory

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	**Related Graduate Attribute and Indicator**
Analyze various performance issues using assembly language programs.	PA-1, PA-2, PA-3, PA-4
Practical use of low-level computer design principles using assembly language and logic circuit design.	DE-1, DE-2, DE-3, DE-4
Practical use of assembly language (NASM) for low-level system programming and interaction in a computer hardware laboratory setting.	UET-1
Individual and team work on the design and physical realization of a logic circuit and the use of assembly language for various low-level programming tasks.	ITW-1, ITW-2, ITW-3, ITW-4

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 231 Discrete Mathematics (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
Fundamentals of logic: basic connectives and truth tables; logical equivalence; the laws of logic; logical implication; rules of inference; the use of quantifiers; proofs of theorems. Sets: the laws of set theory. Boolean algebra. Relation of Boolean algebra to logical and set theoretic operations. Modulo arithmetic: division algorithm. Induction and recursion: induction on natural numbers; recursive definitions. Functions and relations: cartesian products and relations; functions; function composition and inverse functions; equivalence relations. Elements of graph theory: basic definitions of graph theory; paths, reachability and connectedness; computing paths from their matrix representation; traversing graphs represented as adjacency lists; trees and spanning trees. Finite-state machines (FSM) deterministic and nondeterministic machines; regular languages; FSM with output; composition of FSM.

Components: Lectures: 3 hours per week. Tutorial: 1 hour per week

Note: Students who have received credit for COEN 231 may not take this course for credit.

Credits: 3 credits
Prerequisites: MATH 204 (Cegep Mathematics 105)
Co-requisites: N/A

Course materials
Required Textbook: *Discrete Mathematics and its Applications,* Rosen, K., McGraw-Hill Education, 8th ed., 2018

Other Open Textbook Resources:
- *Discrete Mathematics: An Open Introduction*
- *Discrete Mathematics* (Levin)
- Additional resources will be posted on the course website as the course progresses.

Grading Scheme

Assessment tool	Weight	Indicator
Assignment 1	5%	KB-1, KB-3
Assignment 2	5%	KB-1, KB-3
Assignment 3	5%	KB-1, KB-3
Assignment 4	5%	KB-1, KB-3
Midterm 1	15%	KB-1, KB-3
Midterm 2	15%	KB-1, KB-3
Final Exam	50%	KB-1, KB-3
Total	100%	

Tentative Course Schedule

1. Binary Arithmetic: Base Conversion, Floating Point Notation: Handout Material (Chapter 1 In Discrete Mathematics, By Giguere And Landsberger)
2. Logic: Propositional Logic, Propositional Equivalence. Chapter 1: 1.1, 1.2, 1.3
3. Logic: Predicates & Quantifiers, Rules of Inference, Introduction to Proofs. Chapter 1: 1.4, 1.5, 1.6, 1.7
4. Set Theory: Sets, Set Operations. Chapter 2: 2.1, 2.2
5. Set Theory: Functions, Sequences and Summations. Chapter 2: 2.3, 2.4
6. Set Theory: Cardinality of Sets, Matrices. Chapter 2: 2.5, 2.6
7. Algorithms: Chapter 3: 3.1
8. Induction: Mathematical Induction. Chapter 5: 5.1, 5.2, 5.3
9. Relations Theory: Relations & Their Properties, Representing Relations, Equivalence, Partial Ordering. Chapter 9: 9.1, 9.3, 9.4, 9.5, 9.6
10. Solving Recurrence relations (chapter 8)
11. Graph Theory: Graphs & Graph Models, Graph Isomorphism, Connectivity, Euler & Hamilton Path. Chapter 10: 10.1, 10.2, 10.3, 10.4, 10.5, 10.7
12. Trees. Chapter 11: 11.1, 11.4, 11.5
13. Finite State Machines. Chapter 13: 13.1, 13.2, 13.3

Details on assessment tools:

Assignments

There will be four assignments that are worth 20% of the total grade. Instructions on will be posted on the Moodle course website. The tentative assignment schedule is as follows:

Assignments	**Posted on**	**Due on**	**Type**
Assignment 1	TBD	TBD	Individual
Assignment 2	TBD	TBD	Individual
Assignment 3	TBD	TBD	Individual
Assignment 4	TBD	TBD	Individual

Midterm Exam

There will be two midterm exams, each is worth 15% of your total grade. The details and Instructions on the exam will be posted on the Moodle course website.

Final exam

There will be one final exam that is worth 50% of your total grade. The details and Instructions on the exam will be posted on the Moodle course website. The exam date will be scheduled by the university.

Other information

Academic Honesty

Violation of the Academic Code of Conduct in any form will be severely dealt with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work. Click on the following link for more information: http://www.concordia.ca/students/academic-integrity.html

Course Expectation

- All course materials will be posted on Moodle: https://moodle.concordia.ca/. Please ensure your access to Moodle and contact help@concordia.ca for any technical problems.
- Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.
- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students shall be familiar with the Code of Rights & Responsibilities: http://rights.concordia.ca
- If you cannot attend class for any reason, unforeseen or not, you are to come and talk or write to me as soon as possible.
- Please note that you are responsible for ensuring appropriate, properly functioning technologies (webcam, microphone, Chrome browser, ability to download the required software, as well as a reliable internet connection with a minimum of a 3G connection).
- Please note that all live sessions (such as live lectures, live tutorials, etc.) will be **recorded**, including any questions that you asked during the sessions. You may use the Chat function or email offline to ask questions privately, if you do not wish to be recorded.
- Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the Academic Code of Conduct and/or the Code of Rights and Responsibilities.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of knowledge	CLO	Evaluation method
KB - A knowledge base for engineering	KB-1. Knowledge base of mathematics	Intermediate	1, 2, 3, 4	Assignments and exams
	KB-3. Knowledge base in a specific domain	Intermediate	5, 6, 7	

Course Learning Outcomes (CLOs):
Upon successful completion of the course, students will be able to:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Use logical notation to model and reason about fundamental mathematical concepts such as sets, relations, functions, and integers.	KB-1
2. Evaluate elementary mathematical arguments and identify fallacious reasoning.	KB-1
3. Understand the notion of mathematical thinking, and mathematical proofs, and be able to apply them in problem solving.	KB-1
4. Synthesize induction hypotheses and simple induction proofs.	KB-1
5. Apply graph theory models to solve practical problems of engineering importance.	KB-3
6. Understand and apply finite state machines in modeling computation.	KB-3

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 233 Probability and Statistics for Computer Science (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
This course includes the following topics: Combinatorics; axioms of probability; conditional probability; discrete and continuous probability distributions; expectation and moments; hypothesis testing; parameter estimation; correlation and linear regression; and applications to computer science.

Components: Lecture 3 hours per week; Tutorial 2 hours per week

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Basic calculus (e.g., integration and differentiation)
- Elementary linear algebra

Course materials
Required textbook: Introduction to Probability and Statistics for Engineers and Scientists, 6th edition, Sheldon M. Ross

Grading Scheme

Assessment tool	Weight
Assignments	10 %
Midterm exam	30 %
Comprehensive final exam	60 %
Total	100 %

Tentative Course Schedule

Week	Topic	Text sections	Assignments
1	Introduction, Axioms of probability, Sample spaces having equally likely outcomes	§1, 3.1–3.5	
2	Conditional probability, Bayes formula, Independent events	§3.6-3.8	#1 out
3	Random variables, Joint probability mass function	§4.1–4.3	
4	Expectation, Properties of Expectation, Variance, Covariance, Chebyshev's inequality	§4.4–4.9	#1 due #2 out
5	Bernoulli, Binomial, Poisson, Uniform and Exponential random variables	§5.1-5.2, 5.4, 5.6	
6	Normal random variables, Chi-square distribution, t-distribution	§5.5, 5.8	#2 due
7	Review class, Midterm		

8	Descriptive statistics, Sample mean, Sample median, Sample mode	§2.1-2.3	#3 out
9	Sample mean, Central Limit Theorem, Sample variance, Sample correlation coefficient, Sampling normal populations	§2.5–2.6, 6.1–6.5	
10	Parameter estimation, Interval estimates	§7.1–7.3	#3 due, #4 out
11	Hypothesis testing	§8.1–8.5	
12	Regression	§9.1–9.6	#4 due

Specific knowledge and skills
IDEs that support C++ Programming

Details on assessment tools:

Assignments
There are four assignments worth, in total, 10 percent of the final grade. Each assignment, which must be done individually, is worth 2.5%.

For this course, only electronic submissions will be accepted. You must upload these into the course website through Moodle. In case of difficulty in electronic submission, please contact the instructor or marker. Hard copies will be neither accepted nor evaluated.

For each assignment, you should electronically submit the answers in the form of a PDF document (for other formats, check with the marker(s)). You may wish to scan handwritten mathematical expressions or figures of your solution into the document, but the main text of your solutions should be typeset using a word processor.

As a general rule, the assignments are to be “handed-in” by electronic submission in Moodle by 23h55 of the due date. Late submissions (up to 2 days, including holidays and weekend days) are accepted for all Assignments except for Assignment 2, but will suffer a fixed penalty of 25%. Assignments more than two days late will get no credit. No late submissions are accepted for Assignment 2.

You are advised to retain a copy of all your term work (and proof of electronic submission) until you receive a final course grade.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
The student will be able to compute: a. classical and conditional probabilities for events b. b. population parameters such as mean and variance for known continuous or discrete probability distributions c. c. probabilities for ranges of random variables, particularly for the normal distribution
2. Given a set of experimental data, the student will be able to:

a. compute statistics such as mean and variance, as well as graphically represent the data set though these descriptive statistics
b. compute secondary statistics such a regression curves for experimental paired data
c. compute point estimates or confidence intervals of population parameters
d. make decisions to accept, or not, hypotheses related to population(s) parameters in a variety of situations

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 243 Programming Methodology (3.5 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Labs: Please see your class schedule and lab guidelines for details

Course Calendar Description:
This course is an introduction to computers and programming paradigms. Essential topics from procedural programming languages are discussed such as key elements, reserved words and identifiers, data types and declarations, statements, arithmetic expressions, and different modes of execution. The course covers flow control using If-Else and Switch statements, repetition using loops, recursive functions, pointers, references and dynamic data structures and function pointer. The course material also includes Lambda expression, data structures, built-in arrays, template arrays and vectors, n-dimensional vectors, sorting and searching. Students learn object-oriented programming, user-defined classes, class attributes and methods, object creation, use and destruction. Students are also introduced to exception handling and UML class diagrams.

Components: Lecture 3 hours per week; Tutorial 2 hours per week; Laboratory 12 hours total

Prerequisites: MATH 204 (Cegep Mathematics 105)
Co-requisites: N/A

Course materials
Required Textbook: *C++ How to Program, 10th ed.*, Paul Deitel and Harvey Deitel, Pearson

Other references

- Text book's publisher online resources: http://www.deitel.com/Books/C/CHowtoProgram10e/tabid/3678/Default.aspx
- Additional resources such as Internet links will be posted on the course website as the course progresses

Grading Scheme

Assessment tool	**Weight**
Assignment 1 (individual)	4 %
Assignment 2 (individual)	4 %
Assignment 3 (group)	5 %
Assignment 4 (group)	5 %
Project (group)	7 %
Labs	15 % (5*3%)
Midterm exam	20 %
Final exam	40 %
Total	100 %

Tentative Course Schedule

Week	Topic	Reference
1	Course description	Course Outline
	Introduction to computers and C++	Chapter 1
2	Input and output operators	Chapter 2
	Control statements: 'if' and 'switch'	Chapter 4
3	Repetition with 'while' and 'do-while,' and 'for'	Chapter 4
	Logic operators	Chapter 5
4	Practice exercises – Problem analysis skills	Notes
	Functions	Chapter 6
5	Functions (cont.) and introduction to recursion	Chapter 6
	Practice exercises	Notes
6	Introduction to arrays	Chapter 7
	Class templates array and vector	Chapter 7
7	Midterm Exam	
	Multidimensional arrays and Practice exercises	Chapter 7
8	Introduction to object-oriented programming	Chapter 3
	Introduction to classes and objects	Chapter 3
9	Classes and objects: A deeper look	Chapter 9
	Pointers and references	Chapter 8
10	Pointers and references (cont.)	Chapter 8
	Practice exercises	Notes
11	Introduction to exception handling	Chapter 17
	Introduction to input/output streams	Chapter 13
12	Searching and sorting	Chapter 20
	Review session	All chapters

Lab Details
Please see the lab schedule and lab guidelines (available on Moodle) for details.

Engineering Tools
IDEs that support C++ Programming

Details on assessment tools:

Assignments
There will be four assignments and one project that are worth 25% of the total grade. Instructions on how to package and submit the assignments and project will be posted on the course website. The assignments and project schedules are as follows:

Assignments	Posted on	Due on
Assignment 1 (individual)	TBD	TBD
Assignment 2 (individual)	TBD	TBD
Assignment 3 (group)	TBD	TBD
Assignment 4 (group)	TBD	TBD

Note:

- There is no late submission policy. Late submissions will not be graded.
- For group assignments, you can only have a partner who is enrolled in the same section. You cannot have a partner from a different section.
- Group size: Two (2) students maximum. Groups of 3+ students will not be accepted.

Labs

The labs component accounts for 15% of the overall course grade. The purpose of the labs is to help you be better programmers and develop the skills required to program to specifications. During the lab you will be asked to write the program that produces specific outputs and behaviour.

There will be 6 lab exercises to be completed (Lab 1 to 6). These exercises can only be done during the specified lab period you are registered for and must be submitted at the end of your lab period. The best 5 of 6 grades will be considered (3% for each). Lab topic for each lab will be posted on your course web page the week before. You must attend the lab section you are registered for. **There are no make-up labs.**

Notes:

- The grade for a lab will be zero (0) or maximum for that lab. There will not be an intermediate grade.
  Students need to attend at least 3 out of 6 labs to pass the lab portion of course.
- Lab manual with more details is available on the course webpage.

Midterm Exam

There will be one midterm exam that is worth 20% of your total grade.

Final Exam

There will be one final exam that is worth 40% of your total grade.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning	CLO
A knowledge base for engineering	KB-3 Knowledge base in a specific domain	Introductory	1, 3, 4
Problem analysis	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving PA-4. Analysis (uncertainty and incomplete knowledge)	Introductory	4, 5, 6

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Define the principles of computer-based problem solving and programming	KB-3 Knowledge base in a specific domain
Describe programming concepts and language constructs in C++	KB-3 Knowledge base in a specific domain
Apply C++ concepts including control statement, repetition statement, arrays, classes and objects, pointers, and references	PA-1 Program identification and formulation PA-3 Problem solving
Demonstrate skills in debugging and testing existing C++ programs with the objective of finding faults and improving code quality	PA-1 Program identification and formulation PA-3 Problem solving PA-4 Analysis
Analyze problems using the problem analysis techniques described in the course	PA-3 Problem solving PA-4 Analysis
Demonstrate proficiency in implementing C++ solutions using proper C++ language constructs	PA-1 Program identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 249 Object-Oriented Programming (3.5 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
This course provides a comprehensive introduction to object-oriented programming (OOP), focusing on the design, efficiency, and implementation of software using OOP principles. Key topics include inheritance, polymorphism, exception handling, recursion, and dynamic data structures such as linked lists and array lists. Students explore collections and generics, learning how to develop flexible and reusable code. Through hands-on programming assignments and projects, students gain experience in designing modular, maintainable, and scalable software solutions.

Components: Lecture 3 hours per week; Tutorial 2 hours per week; Laboratory 1.5 hours per week

Prerequisites: AI 243; MATH 203 or Cegep Mathematics 103 or NYA
Co-requisites: MATH 205 or Cegep Mathematics 203 or NYB

Specific Knowledge and Skills Needed for this Course:

- Some previous experience of programming in Java such as that provided in COMP 248 or a similar course. In particular, a good understanding of expressions, statements, methods, parameters, and arrays.
- Knowledge of the basic concepts of objects, classes, and packages.

Course materials
Required Textbook: *Absolute Java* by Walter Savitch, *6th or later*, Addison Wesley

Many resources for the course (slides, assignments, example programs, ...) will be available online.

Grading Scheme

Assessment tool	Weight
Assignments	20%
Midterm exam	25%
Final exam	55%
Total	100 %

Tentative Course Schedule

Week	Chapters	Material
1	4, 5 and 6	Review of Classes, Objects & Arrays
2	7	Inheritance
3	8	Polymorphism and Abstract Classes
4	9	Exception Handling
5	9	Exception Handling

6	10	File I/0 & Serialization
7	11	Recursion
8	13	Interfaces & Inner Classes
9	13	Interfaces & Inner Classes
10	14	Generics
11	15 and 16	Linked Data Structures & Collections
12	17 and 18	Graphical User Interfaces

Details on assessment tools:

Labs

The purpose of the labs are:
1) To provide you with better programming skills, grasp of the course materials, and good preparation for your exams.
2) To assist you with any questions that you might have about your programs and assignments.
3) To conduct lab exercises (please read very carefully): there will be one lab exercise each week during the course. These exercises must be done individually and be submitted during your lab period. To be clear, a lab exercise can only be done during one single lab period (which you are registered into) and must be submitted electronically to the correct lab folder on the Moodle for your section by the end of that lab time.

These lab exercises will not be marked (or only random ones will be selected for marking) and hence may not evaluate to any load of the course. You are required to perform and submit ALL of these lab exercises. Although these lab exercises may not represent any load after all, failing to perform and submit any of them will cost you some significant marks. There is no make-up for a missed lab exercise.

Assignments

There will be 4 to 5 assignments. The assignments will examine the programming materials and subjects covered in class and will allow you to develop a stronger foundation of problem analysis and solving. While all assignments have a programming component; some of them may have a theoretical component as well. You are allowed to work either individually or in a group of two, with another student from the same, or from a different, section. No additional marks are given for working individually. Assignments are to be submitted electronically only - no paper submission. Instructions on submitting assignments will be given in the first assignment. All assignment handouts will be available on the course web pages.

Submission format: For the programming assignments, all assignment-related submissions must be adequately archived in a ZIP file using your ID(s) and last name(s) as file name. The submission itself must also contain your name(s) and student ID(s). Use your “official” name only - no abbreviations or nick names; capitalize the usual “last” name. Inappropriate submissions will be heavily penalized. Students will have to submit their assignments (again, one copy per group for the programming assignments).

Note: For the programming part only, a demo will take place with the markers afterwards. Markers will inform you about the details of demo time and how to book a time slot for your demo. If working in a group, both members must be present during demo time. Different marks may be assigned to teammates based on this demo.

- If you fail to demo, a zero mark is assigned regardless of your submission.
- If you book a demo time, and do not show up, for whatever reason, you will be allowed to reschedule a second demo but a penalty of 50% will be applied.
- Failing to demo at the second appointment will result in zero marks and no more chances will be given under any conditions.

Midterm Exam

The midterm will cover all material presented in the lectures, the textbook, and in the assignments and labs, up to and including the lecture preceding the exam. Passing the midterm exam is necessary for passing the course. There is no make-up midterm exam.

Final Exam

There will be one common final exam for all sections. The final examination will be administered during the examination period at the end of the term. The final examination covers all material seen during the term, and will examine your developed skills of problem analysis, in addition to your programming knowledge of the subjects covered during the entire course.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Description
A knowledge base for engineering	KB-3 Knowledge base in a specific domain	Knowledge of advanced concepts in object-oriented programming, including classes, inheritance, polymorphism, static and dynamic binding, abstract classes, exception handling, file I/O, recursion, interfaces and inner classes. Basic knowledge of the design and implementation of graphical user interfaces, generic programming, collections and iterators
Design	DE-3. Detailed design DE-4. Validation and implementation	Determine appropriate classes and their relationships, data structures, abstractions, use of external libraries in order to design a maintainable and extensible solution that meets the identified specifications and constraints using an object-oriented programming language.
Use of engineering tools	UET-1 Ability to use appropriate tools, techniques and resources	Determine what appropriate syntactical constructs, data structures, libraries and abstractions to use to solve relatively complex programming problems in order to meet the problem's identified specifications and constraints.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to be able to do the following:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator

1. Write more modular, robust and flexible Java programs by building on the knowledge acquired in COMP 243.	KB-3, UET-1
2. Design and implement Java programs which: • Include a hierarchy of classes (inheritance, polymorphism and abstract classes, inner classes and interfaces • Include generic classes • Deal with unexpected situations (exception handling) • Read and/or write data to/from a file • Use Collections and make use of tools that allow you cycle through all elements of a collection (iterators) • Use data structure classes which are available in Java libraries such as Array Lists, Linked Lists, Hash Tables, Trees and Sets to name a few	DE-3, DE-4
3. Design and implement: • Methods that call themselves (recursions) • Graphical user interfaces (GUIs)	DE-3, DE-4, UET-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 300 Mathematics for AI (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence and Machine Learning, with an emphasis on implementation. Students develop core mathematics and programming skills to learn numerical and tensor libraries for expressing linear algebra operations and high-performance tensor computations. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue/SVD intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance/correlation, entropy, and KL divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train/validation/test methodology, performance metrics, model development, and experiment tracking tools.

Components: Lecture 3 hours per week; Tutorial 1 hour per week

Prerequisites: AI 231, AI 249
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

1. Calculus mathematics
2. Statistics and probabilities
3. Programming skills including object-oriented programming

Course materials
Required Textbook: *Mathematics for Machine Learning*, Deisenroth, M. P., Faisal, A. A., & Ong, C. S., Cambridge University Press, 2020

Course Materials: Students will be provided with course slides and Google Colab tutorials.

Grading Scheme

The final grade for the course will be determined based on the following assessment tools and weights.

Assessment tool	Weight
Midterm Exam	25%
Final Exam	25%
Practice Exam	20%
Theoretical Assignments	15%
Lab Assignments	15%
Total	100%

Tentative Course Schedule

Week	Topic	Description & Key Concepts
1	Introduction to Python for Scientific Computing	Introduction to Python, data structures (lists, tuples, sets, dictionaries), data processing libraries (PIL, Pandas/DataFrame, NLTK), lists of objects, error handling, visualization (Matplotlib), Jupyter notebooks, Python environment management (conda/venv, pip, dependency pinning, GPU/CUDA installation notes).
2-3	Linear Algebra and Tensor Libraries	Basic matrix and tensor multiplications, matrix properties (transpose, orthogonality, rank, determinant, trace, norms, distances), eigenvalues and singular value decomposition (SVD), Principal Component Analysis (PCA), Independent Component Analysis (ICA), matrix inversion, Moore-Penrose Pseudoinverse, implementation using NumPy and PyTorch.
4-5	Gradient Analysis	Single-variable derivatives, single-variable minimization and maximization problems with exercises, taylor expansion, partial derivatives for multivariable functions, differentiation rules, chain rule, gradients and matrix-based views of gradients (Stanford reference), gradient computation demonstrations using PyTorch, Jacobian of a vector, second order derivatives and Hessian analysis, Convexity analysis.
6	Midterm Exam	
7-8	Optimization	Objective functions for minimization, numerical vs analytical optimization, gradient-based optimization, non-stochastic gradient descent, stochastic gradient descent, adaptive optimization methods, second order optimizers, constrained optimization, lagrange multipliers, equality and inequality constraints including KKT conditions, exercises and PyTorch implementations.

9-10	**Probability and Statistics**	Random variable, probability density functions, stochastic moments (e.g, expectation, variance) Gaussian distribution and the Central Limit Theorem, transformations, Kullback–Leibler (KL) divergence, entropy, covariance and correlation, statistical significance and hypothesis testing, Bayes'rule, conditional probability, marginal probability, join probability, Markov chains sampling, exercises and PyTorch implementations.
11-12	**Machine Learning Pipelines**	Numerical Computation, Overflow, underflow, random seeds and reproducibility, data manipulation (e.g, shuffling, normalization, augmentation), introduction to machine learning models, parameters and hyperparameters, training, validation, and test splits, performance metrics, regularization, end-to-end workflows. Exercises and PyTorch implementations.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
A knowledge base for engineering	KB-1 Knowledge base of mathematics	Intermediate / developed
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources	Introductory

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Familiarization and fully understanding the mathematical foundations behind Artificial Intelligence (AI) algorithms and models designs	KB-1
2. Familiarization with popular libraries and toolkits used in machine learning and deep learning	UET-1, UET-2
3. Basic implementation and understanding of machine learning pipelines and how they operate in different downstream applications	PA-1, PA-2, PA-3

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 332 Foundations for AI (4 credits)

Note: This course is included only in the B.Sc. in AI. (Graduate Attribute information is not required.)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
This course provides a practical, mathematically grounded introduction to the computational foundations that underpin modern Artificial Intelligence and Machine Learning, with an emphasis on implementation. Students develop core programming skills and learn to use numerical and tensor libraries to express linear algebra operations and high-performance tensor computations, including indexing, broadcasting, vectorization, and GPU-enabled execution. The course introduces key mathematical concepts such as vector and matrix operations, norms, eigenvalue / SVD intuition, derivatives, gradients, the chain rule, and basic optimization (including constrained optimization) and demonstrates how these ideas are realized in modern AI software frameworks. Core topics in probability and statistics are presented with programmatic simulations, including expectation, common distributions, the Central Limit Theorem, sampling, covariance / correlation, entropy, and KL divergence. The course concludes with an introduction to reproducible ML experimentation and the end-to-end training workflow: data handling, train / validation / test methodology, performance metrics, model development, and experiment tracking tools.

Components: Lecture 2.5 hours per week; Lab 1 hour per week

Prerequisites: AI 249
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

1. Calculus mathematics
2. Statistics and probabilities
3. Programming skills including object-oriented programming

Course materials
There will be a series of papers, course slides, reports, GitHub repositories which will be assigned during the lecture for reading and preparation.

Grading Scheme

Assessment tool	Weight
Exams	70%
Project	15%
Labs and assignments	15%

Total	100%

Tentative Course Schedule

Lecture 1: Introduction to Python for Scientific Computing
Introduction to Python, data structures (lists, tuples, sets, dictionaries), data processing libraries (PIL, Pandas/DataFrame, NLTK), lists of objects, error handling, visualization (Matplotlib), Jupyter notebooks, Python environment management (conda/venv, pip, dependency pinning, GPU/CUDA installation notes).

Lecture 2: Linear Algebra and Tensor Libraries
Basic vector–matrix multiplication and elementwise operations, eigenvalues and singular value decomposition (SVD), determinant and matrix inversion, norms, dot product and inner product (Hilbert) spaces, implementation using NumPy and PyTorch, reference to the Linear Algebra chapter of the Deep Learning book.

Lecture 3: Advanced Tensor Libraries
Indexing, broadcasting, CPU/GPU computation, device placement (CPU/CUDA), batching, memory management, mixed precision, vectorization (converting iterative for-loop computations to tensor operations), PyTorch demonstrations and exercises.

Lectures 4–5: Gradient Analysis I & II
Single-variable derivatives, single-variable minimization and maximization problems with exercises, partial derivatives for multivariable functions, differentiation rules, chain rule, gradients and matrix-based views of gradients (Stanford reference), gradient computation demonstrations using PyTorch.

Lecture 6: Gradient Descent
Objective functions for minimization, non-stochastic gradient descent calculations, reference to Chapter 4 of the Deep Learning book, PyTorch function examples and implementations.

Lecture 7: Constrained Optimization
Lagrange multipliers, equality and inequality constraints including KKT conditions, exercises.

Lectures 8–9: Probability and Statistics I & II
Expectation, probability density functions, Gaussian distribution and the Central Limit Theorem, random variable transformations, Kullback–Leibler (KL) divergence, entropy, covariance and correlation, statistical significance and hypothesis testing, sampling, PyTorch-based simulations of all topics, reference to the Probability and Information Theory chapter of the Deep Learning book.

Lecture 10: Reproducibility in Machine Learning
Random seeds and reproducibility, PyTorch demonstrations and exercises, reference to Chapter 4 of the Deep Learning book.

Lectures 11–12: Machine Learning Pipeline Implementation I & II
Training, validation, and test splits, performance metrics, end-to-end workflows using PyTorch Lightning (DataLoader, training, fitting, prediction, visualization), monitoring and experiment tracking (e.g., Weights & Biases).

Lab Details
The lab material are aligned with the course lecture topics for Python coding including but not limited to numpy, pandas, PIL, DataFrame, NTLTK, Matplotlib, scikit learn, pytorch.

Engineering Tools
numpy, pandas, PIL, DataFrame, NTLTK, Matplotlib, scikit learn, pytorch

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following engineering science concepts.

(1) familiarization with and fully understanding the mathematical foundations behind Artificial Intelligence (AI) algorithms and models designs
(2) familiarization with popular libraries and toolkits used in machine learning and deep learning
(3) basic implementation and understanding of machine learning pipelines and how they operate in different downstream applications

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 333 Big Data Analytics (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course focuses on the fundamentals of the big data terminology, concepts and technologies. For the technical aspects of big data management systems, the course focuses on big data engines, programming models and file systems. Specific techniques covered include supervised classification, recommender systems, data clustering, frequent itemsets mining, similarity search, data streams and graph analysis. A project provides extensive hands-on experience.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 352
Co-requisites: N/A

Course materials
Required Textbook: MMDS: *Mining of Massive Datasets, 3rd ed. (beta version)*; J. Leskovec, A. Rajaraman, and J. Ullman

Grading Scheme

Assessment tool	Weight
Lab assignments (3)	15%
Midterm exam	20%
Final exam	40%
Project	25%
Total	100%

Tentative Course Schedule

Week	Lecture topic	Assignment / Lab activities
1	Introduction	None
2	Data locality (Hadoop MapReduce & HDFS)	Even teams: Git/GitHub/Python/pytest Uneven teams: Project Definition Project teams must register
3	In memory computing & lazy evaluation (Apache Spark, Dask)	Uneven teams: Git/GitHub/Python/pytest Even teams: Project Definition
4	Supervised Learning	Even teams: Spark RDDs, DataFrames, intro to LA1 Uneven teams: Data model design
5	Recommender Systems	Uneven teams: Spark RDDs, DataFrames, intro to LA1 Even teams: Data model design
6	Clustering	Even teams: Introduction to LA2 Uneven teams: LA1 (data preparation)
7	Midterm Exam	
8	Frequent Itemsets	Uneven teams: Introduction to LA2

		Even teams: Data preparation
9	Data Streams	Even teams: Introduction to LA3 Uneven teams: Model implementation Project data model due during clinic
10	Graph Analysis	Uneven teams: Introduction to LA3 Even teams: Model implementation Project data model due during clinic
11	Similarity Search	All teams: Help with LA3 Uneven teams: Project presentations
12	Project Presentations	Final project presentations

Engineering Tools
Git, GitHub, Python, pytest, Hadoop, Apache Spark.

Details on assessment tools:
Lab Assignments (15%)
You will be required to develop data analysis programs in Python using Apache Spark or Dask. There will be a total of three assignments. You must work on these assignments individually. Assignments must be submitted through GitHub Classroom, you will receive a link for each assignment.

Exams (60%)
There will be a mid-term and a final exam. All examinations will be closed book and no electronic device will be allowed except ENCS calculators. Exams will be Multiple-Choice Questionnaires. The midterm will be conducted in-class and will count for 20% of the final grade. The final exam will count for 40% of the final grade. There will be no substitution for a missed exam.

Project (25%)
This course will walk you through the definition and implementation of a data-science project using Big Data technologies. During the project clinics and lecture, the instructors will guide you through the following milestones:

1. **Project definition**:
   - Option 1: Own Project. You will define your own project by identifying: (1) a dataset of interest, (2) a set of research questions to be answered with the dataset, using techniques studied in class. If you are doing a Master or PhD thesis, you are encouraged to define a project linked to your research topic.
   - Option 2: Industrial Project. You will select a project proposed by a company through the Riipen platform. Industrial projects will be validated by the instructors.

Both project types are expected to follow the same milestones (described below).Milestones for industrial projects might be slightly revised depending on the exact nature of the projects.

2. Model design: choose a class of models in {supervised learning, recommender system, clustering, frequent itemset}. Outline how the data model could be applied to your dataset to answer your research question. Research algorithms and techniques to implement this class of model.

3. Data preparation: inspect the dataset, identify missing data, outliers, data types (categorical data in particular), and write Spark or Dask programs to correct for potential issues.

4. Model implementation: implement the model with Spark, Dask or scikit-learn.

5. Model evaluation: identify evaluation metrics for your model. Implement and discuss them.

Projects will have the following deliverables. Deadlines are indicated on the schedule. No deadline extension will be granted.

1. Team registration (1%) Easy point! Please register your team of 4 students on time to allow for a smooth organization of project clinics.

2. Participation (3%) Attendance and participation to project clinics. Project clinics will follow the following template:

1. Project team presents updates to class (5')
2. Instructor gives feedback and directions (5'). Audience may ask questions.
3. Feedback on project milestones (3').

Don't miss an opportunity to get feedback on your project!

3. Project summary (3%) The project summary will be a 400-word abstract available as a Markdown (.md) document in a GitHub repository. The summary will report on project definition and model design. It will describe the dataset and its main characteristics (number and type of features), the research questions to be addressed in the project, the class of models to be applied to the dataset, and the algorithms that will be used. At least two algorithms must be used and compared. The project summary will be evaluated during the project clinics (see schedule table).

4. Project data model (10%) The project data model will be delivered as a Jupyter notebook containing code and explanations to implement data preparation, model training and (optional) model evaluation. The project data model will be evaluated during the project clinics (see schedule table).

5. Final project presentation (8%) The project presentation will be delivered during the last week of the course as a 6-10 minute presentation putting special emphasis on model evaluation and summarizing the other project milestones.

Project deliverables will be evaluated using specific rubrics. All criteria will be assessed on a 4-level scale: unacceptable, average, good, excellent.

Note: project team grades may be weighted differently for each participant in case the team judges that some team members have not contributed significantly to the project. Grading Scheme: There is no standard relationship between percentages and letter grades assigned. The grading of the course will be done based on the relative percentages assigned to the assignments, project and the exam. There is no definite rule for translation of number grades to letter grades.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Knowledge base for engineering	KB-1 Knowledge base of mathematics KB-3 Knowledge base in specific domain	Advanced Intermediate / developed
Problem analysis	PA-2 Modelling PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate / developed
Investigation	INV-1 Background and hypothesis formulation INV-2 Designing experiments INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Intermediate / developed
Design	DE-1 Define the objective DE-2 Idea generation and selectin DE-3 Detailed design DE-4 Validation and implementation	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources	Intermediate / developed
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution: practical / conceptual ITW-3 Initiative and leadership ITW-4 Team dynamics	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1.Perform data preparation and data labeling on a dataset prior to its use for consumption by the data analysis.	INV-2
2.Perform supervised and unsupervised learning on the dataset.	INV-3
3.Implement a recommender system based on a dataset.	INV-1, PA-2
4.Use frequent itemsets and similarity search in high-dimensional datasets.	UET-1
5.Use graph analysis to handle highly-connected, high-variety data.	INV-3, INV-4, PA-4, UET-1
6.Use data streaming to deploy solutions for real-time decision-making in high-velocity and high-volume scenarios.	INV-3, UET-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 334 Deep Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces conceptual and practical aspects of deep learning and their implementation in software. Topics covered include commonly used deep learning model architectures, loss functions, regularization, optimization methods, and a strong emphasis is placed on review of their foundations and use of software tools such as pytorch, jax, and tensorflow to implement and/or apply these models. Applications in computer vision and natural language processing are covered. A final project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Linear algebra, multivariate calculus, probability, and algorithms

Course materials
Required textbooks:
- *Deep Learning*, Goodfellow et al., freely available at www.deeplearningbook.org
- *Dive into Deep Learning***,** freely available at http://preview.d2l.ai/d2l-en/master

Some material not in the textbook will be covered with appropriate references

Grading Scheme

Assessment tool	**Weight**
Assignments	30%
Project	30%
Quizzes	30%
Labs	10%
Total	100%

Tentative Course Schedule

Lec 1 - Machine Learning Foundations for Deep Learning
Lec 2 - Introduction to Neural Networks
Lec 3 - Backpropagation
Lec 4 - Automatic Differentiation Software

Lec 5 - Optimization for Deep Learning
Lec 6 - Training Deep Neural Networks in Practice
Lec 7 - Convolutional Neural Networks
Lec 8 - RNNs, Sequence models, Seq2Seq
Lec 9 - Attention and Self-Attention
Lec 10 - Multi-task and Transfer Learning
Lec 11 - Introduction to Deep Generative Models
Lec 12 - Self-Supervised Learning

Details on assessment tools:

Assignments (30%)

- 2 Problem sets will be given throughout the semester.
- The assignments will be programming projects and some paper and pencil problems
- (20% of the assignment).
- Assignments are to be done strictly individually.

Quizzes (30%)

- Quizzes will be given throughout the semester in class (announced well in advance).
- The quizzes will be 30-45 minutes long with multiple-choice and long answers.

Project (30%)

Teams of 2-3 students will work on a project. Students will select from a predefined project or give their own proposal.

Lab (10%)

- Throughout the semester weekly labs will be given and TAs will assist students in doing the lab.
- There will be two phases of labs (graded and ungraded): Lab 2-5 will be graded and comprise the lab grade. The rest of the labs are optional but will count as additional marks.
- The labs will be posted on Moodle along with their submission link and due dates.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
A knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate / developed
Problem analysis	PA-1 Problem identification and formulation	Intermediate / developed
Design	DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Explain the theoretical foundations of deep learning, including neural network architectures, loss functions, optimization algorithms, and regularization techniques.	KB-3
Implement deep learning models using modern software frameworks (PyTorch, JAX, TensorFlow) and apply best practices in model construction, debugging, and training.	UET-1
Apply automatic differentiation tools to compute gradients and analyze computational graphs for deep network training.	UET-1, DE-4
Design and train convolutional neural networks (CNNs) for computer vision tasks.	UET-1, DE-4
Build and evaluate recurrent and sequence-based models (RNNs, LSTMs, GRUs, Seq2Seq) for temporal and sequential data.	UET-1, DE-4
Implement and analyze attention mechanisms and transformer-based architectures, including self-attention, for applications in NLP and related areas.	UET-1, DE-4
Apply transfer learning, multi-task learning, and self-supervised learning techniques to address real-world problems with limited labeled data.	UET-1, DE-4
Develop and present a complete deep learning project involving problem formulation, dataset preparation, model selection, evaluation, and communication of results.	PA-1, DE-2, DE-3, DE-4

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 335 Reinforcement Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces reinforcement learning, an active and rapidly developing subfield of machine learning. Reinforcement learning focuses on the design of computational agents that learn to predict and make decisions in complex, uncertain and dynamic environments based on experience. Applications include classical control problems such as power plant optimization and dynamical system control, as well as game playing, inventory management, and other domains. The field has also produced influential models of animal and human learning. This course provides a solid introduction to the filed of reinforcement learning and students learn both the fundamental concepts and advanced topics of RL, including Markov Decision Processes (MDPs), dynamic programming, and policy iteration. The course also covers value-based methods such as Deep Q-Networks (DQN), policy-based methods including policy gradient and actor critic algorithms, as well as model-based reinforcement learning. In addition, students explore how RL techniques are applied in modern computer vision and AI applications. The many possible ethical risks of reinforcement learning are covered. To deepen the understanding, the course includes hands-on project and implementations using Python/PyTorch.

Components: Lecture 2.5 hours per week; Lab 2 hours per week

Prerequisites: AI 330 or AI 332, AI 334
Co-requisites: N/A

Course materials

Suggested textbooks:

- *Reinforcement learning: An introduction*, 2nd ed.; Richard S. Sutton and Andrew G. Barto; MIT Press; 2019
- *Algorithms for Reinforcement Learning*, Szepesvari

Programming: Python / PyTorch

Lecture notes and other relevant materials will be available on course web page.

Grading Scheme

Assessment tool	Weight
Assignments	20%
Project	30%
Exams	50%
Total	100%

Tentative Course Schedule

Week	Topic
1	Introduction to Reinforcement Learning Ethical risks related to Reinforcement Learning
2	Markov Decision Processes
3	Dynamic Programming
4	Monte Carlo and Temporal Difference Learning
5	Q-Learning
6	DQN and advanced techniques
7	Policy Gradient
8	Actor Critic
9	Advanced Policy Gradient
10	Continuous Controls
11	Imitation Learning
12	Model-based RL

Engineering Tools
Python / PyTorch

Details on assessment tools:
Assignments
Throughout the semester, students complete four assignments done individually. In addition, students will be working on a semester-long project in groups of up to 3 that includes implementing RL algorithms in real word problem domain. The project must be programmed in Python / PyTorch. and may involve the writing of a report or an oral presentation, as well as a demo of the work.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate / developed
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Intermediate / developed
Design	DE-2 Idea generation and selection	Intermediate / developed
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Demonstrate a solid understanding of core reinforcement learning concepts and clearly distinguish reinforcement learning from other machine learning paradigms.	KB-3
2. Model real-world decision-making problems within the reinforcement learning framework, including the formulation of Markov Decision Processes (MDPs).	PA-1, PA-2
3. Understand and implement both value-based approaches (e.g., Q-learning and Deep Q-Networks) and policy-based approaches (e.g., Policy Gradients and Proximal Policy Optimization) for solving discrete and continuous control problems.	PA-3, UET-1, UET-2, UET-3
4. Comprehend more advanced value-based and policy-based reinforcement learning methods and apply them to the design of improved or more sophisticated algorithms.	KB-3, DE-2
5. Evaluate and compare reinforcement learning algorithms using appropriate performance metrics and evaluation criteria.	UET-2, UET-3
6. Analyze the strengths, limitations, and practical applicability of state-of-the-art reinforcement learning algorithms in real-world scenarios.	PA-4, UET-3
7. Demonstrate understanding of the ethics/equity risks involved in Reinforcement Learning and implement risk mitigation strategies / models.	EE-1, EE-2

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 336 Machine Learning (4 credits)

Note: This course is included only in the B.Sc. in AI. (Graduate Attribute information is not required.)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
This course introduces conceptual and practical aspects of machine learning. Concepts include regression, classification, maximum likelihood estimation, discriminative vs. generative modelling, generalization, supervised learning, unsupervised learning, semi-supervised learning and transfer learning. Methods include linear models, mixture models, nearest neighbours, support vector machines, random forests, boosting, and basics of deep learning. A project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Strong Python programming skills (quality of Python code matters)
- Basic linear algebra, basic multivariable calculus, and basic probability
- Basic understanding of numerical computing and/or optimization

Course materials
Required textbook: *Pattern Recognition and Machine Learning*; Christopher M. Bishop; 2006

Other recommended textbooks:
- *Introduction to Machine Learning with Python* by Andreas Mueller and Sarah Guido (2016)
- *Pattern Classification* by Richard O. Duda, Peter E. Hart, and David G. Stork (2001)
- *Deep Learning* by Ian Goodfellow, Yoshua Bengio, and Aaron Courville (2016)
- *Applied Machine Learning* by David Forsyth (2019)

Grading Scheme

Assessment tool	Weight
Project	35%
Midterm exam	20%
Final exam	25%
Assignment	10%

Labs (1% each)	10%
Total	100%

Tentative Course Schedule

Week	Lecture topics	Lab
1	Introduction to Machine Learning	
2	Linear Regression, Maximum Likelihood, Logistic Regression	Lab1 Exercises on Python, Numpy, MatplotLib, Pandas
3	Clustering, K-Means, Gaussian Mixtures	Lab2 Linear Models
4	Kernel Density, Support Vector Machines	Lab3 Clustering
5	Midterm exam	Lab4 Support Vector Machines
6	Bootstrap, Bagging, Boosting, Ensembles	Lab5 SVM
7	Loss, Cross Validation, Hyperparameter Search	Lab6 Boosting
8	Neural Networks, Backpropagation	Lab7 Hyperparameter Search
9	Convolutional Networks, Recurrent Networks	Lab8 Neural Networks
10	Dimensionality Reduction, PCA, Autoencoders	Lab9 CNN
11	Generative Models, Naive Bayes, Gaussian Processes	Lab10 GaussianProcesses
12	Project presentations	

Assessment details

Projects
Projects must be done in groups of 3–4 students. The 35% project grade breaks down as follows:

- 4% project proposal explaining your project goals and plans (max 2 pages)
- 3% project presentation to be submitted with the report; the instructor will play these in final lecture.
- 3% originality to be assessed by the instructor, to reward groups that propose interesting projects
- 15% project report describing your project data, methods, and conclusions (no more than 8 pages)
- 10% code and data to be submitted with the report; the instructor and TAs will inspect these files

The projects have specific requirements around group assignment, equal contribution, and code reproducibility.

- Students who form their own group must send the names to the instructor via Moodle direct message by the announced deadline. Otherwise they will be randomly assigned a group.
- Project proposals must be written using the LATEX template provided on Moodle. Proposals will be collected as a Moodle "assignment" with up to 250 MB of combined code and data.

- Students are expected to contribute equitably. If an individual group member fails to contribute meaningfully, that person's individual project grade may be lowered.
- The "originality" grade is subjectively assessed by the instructor, with the goal of having students put time into designing their own project and not taking one "off the shelf". For example, if you simply attack a standard Kaggle competition, for which many project codes exist on the web, then you will receive an originality score of 0% even if you did a great job at implementing and writing the report.

Assignment
The assignment will involve programming in Python. Assignments will be collected via a Moodle "assignment". Assignment instructions will be posted partway through the term.

Labs
There are 10 labs worth 1% each of 10% of the total grade. Labs are a major learning opportunity in this course, in terms of practical skills and understanding how the algorithms work—please take advantage of labs. Lab sessions are primarily for you to get help from your lab supervisor or from peers. Solutions to early labs will be provided, but not for later labs.

- Lab files will be collected as a Moodle assignment each week.
    - Submit labs with the code cells already run, so that the TA does not need to re-run your lab.
    - The TA for your section will give you lab grade of 0.5 if you completed approximately half the lab and 1.0 if you completed the entire lab.
    - Even if your lab appears complete, the TA will assign 0.0 if he/she determines that you have typed nonsense into the code cells, effectively wasting the TA's time. Any suspected plagiarism will be reported.
- You must attend your assigned lab section ONLY. Please respect this rule, it helps balance work among the TAs and to keep them organized.
- Students are encouraged to help each other with labs verbally, but copying code is forbidden. You must be the author of all your submitted answers.

Engineering Tools
numpy, pandas, PIL, DataFrame, NTLTK, Matplotlib, scikit learn, pytorch

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following engineering science concepts.

(1) familiarization with and fully understanding the mathematical foundations behind Artificial Intelligence (AI) algorithms and models designs
(2) familiarization with popular libraries and toolkits used in machine learning and deep learning
(3) basic implementation and understanding of machine learning pipelines and how they operate in different downstream applications

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 340 Generative AI (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course provides a comprehensive overview of modern generative artificial intelligence models and techniques. Students study the theoretical foundations and practical implementations of the most popular generative models, including classical probabilistic models, variational autoencoders, generative adversarial networks, energy-based models, diffusion models, normalizing flows, autoregressive models, and large language models. Advanced topics include multimodal generative models and an overview of the most recent scientific articles in the field. The many possible ethical risks of generative artificial intelligence are covered. Through lectures, assignments, and a course project, students develop the ability to analyze, implement, and critically evaluate generative AI systems.

Components: Lecture 3 hours/week; Laboratory 1 hr/week

Prerequisites: AI 334
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- **Machine Learning:** Supervised and unsupervised learning principles, loss functions, optimization algorithms, and model evaluation metrics.
- **Deep Learning:** Neural network architectures (MLPs, CNNs, RNNs, Transformers), backpropagation, regularization techniques
- Programming skills including object-oriented programming

Course materials
Required Textbook: *Deep Learning: Foundations and Concepts*; Christopher M. Bishop and Hugh Bishop; Springer, 2024

Students will be provided with course slides and Google Colab tutorials.

Grading Scheme

The final grade for the course will be determined based on the following assessment tools and weights.

Assessment tool	Weight
Midterm Exam	20%
Final Exam	30%
Project	40%
Assignments	10%
Total	100%

Tentative Course Schedule

Week	Topic	Description & Key Concepts
1	Introduction to Generative Models	Course Introduction, Discriminative vs Generative models, Historical evolution, Taxonomy of Generative Models, Evaluation, Failure modes (mode collapse, overfitting, generalization), Ethical risks related to Generative Artificial Intelligence
2	Classical Probabilistic Generative Models	Gaussian Mixture Models, EM algorithm, Hidden Markov Models.
3	Variational Autoencoders	Latent variable generative models, Intractability of exact inference, Variational inference and the ELBO, VAE architecture and training, Limitations.
4	Generative Adversarial Networks	Adversarial learning, minimax games, GAN architectures, training, stability, model collapse
5	Energy-based Models	Energy functions and unnormalized densities, Langevin dynamics, Restricted Boltzmann machines.
6	Diffusion	Denoising intuition, forward and reverse processes, sampling, connection to energy-based models
7	Midterm Exam	
8	Normalizing Flow Models	General idea and intuition, Invertible transformations, Continuous normalizing flows, Flow Matching.
9	Autoregressive Generation	Chain rule factorization of distributions, Autoregressive neural architectures, Examples: PixelRNN, Wavnet, sampling strategies, Strengths and limitations.

10	Large Language Models	Autoregressive text generation, Transformer architecture, Training, Scaling laws, Reinforcement Learning from Human Feedback, Benchmarks
11	Multimodal Large Language Models	Image tokens, Audio Tokens, Native Multimodal LLMs
12	Research and Open Problems	Analyses of recent research papers and discussion of open problems

Engineering Tools
PyTorch for designing Generative AI models

Details on assessment tools:

Project
The project component of this course provides hands-on experience in implementing Generative AI systems.

Project expectations:
- End-to-End Implementation: Design and deploy a functional Generative AI model
- Technical Proficiency: Demonstrate skills in implementing and testing deep neural networks for Generative AI, including the ability to clearly explain the results critically.
- Documentation: Provide professional documentation and a technical description of the Generative AI model implemented.

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	**Indicators**	**Level of coverage**
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced / Applied
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling	Advanced / Applied
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Advanced / Applied
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
CLO 1: Implement state-of-the-art generative frameworks, such as VAEs, GANs, Diffusion models, and Autoregressive Transformers, using modern AI libraries and GPU acceleration.	UET-1, UET-2, UET-3
CLO 2: Understand the theoretical principles of generative modelling.	KB-3, PA-1, PA-2
CLO 3: Understand potential and limitations of modern generative AI methods.	UET-3
CLO 4: Demonstrate understanding of the ethics/equity risks involved in Generative Artificial Intelligence and implement risk mitigation strategies/models.	EE-1, EE-2

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 345 Agentic AI (3 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces the principles, architectures, and engineering practices of Agentic Artificial Intelligence -- AI systems capable of autonomous perception, reasoning, planning, and action. Students learn how modern agentic systems extend large language models with memory, tools, planning, and collaboration mechanisms to solve complex tasks. The course emphasizes conceptual foundations, engineering design of agent systems, and hands-on development using Python. In addition, the course covers the ethical aspects and responsible use of Agentic AI such as ethical foundations, societal impact, transparency, accountability, safety, security and data and privacy governance. Applications include intelligent assistants, autonomous decision systems, robotics, digital twins, and smart-city infrastructure. A project is required.

Components: Lecture 3 hours per week; Laboratory 1 hour per week

Prerequisites: AI 340
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine learning: Basic knowledge in AI and machine learning.
- Python programming: Basic python programing skills.
- Data structures and algorithms: understanding basics in data structures and algorithms.

Course materials

- Up-to-date course materials will be provided by the instructor.
- Students will be provided with the following materials to support their learning and laboratory work:
  - Sample projects: sample project tutorials and codes will be provided.
  - Lecture Slides and Lab Manuals: Will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	Weight
Midterm exam	20%
Final exam	45%
Design project	35%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Agentic AI	From generative AI to agentic systems; Definitions of autonomy and agency; Historical perspective on intelligent agents; Application domains **Lab**: Explore a simple LLM agent
2	Foundations: LLMs as Cognitive Engines	Transformer architecture overview; Prompting and reasoning capabilities; Limitations of standalone LLMs; Role of LLMs in agent systems. **Lab**: Prompt engineering experiments
3	Prompt Engineering for Agents	Chain-of-Thought, ReAct, Tree-of-Thought; Role prompting, context management **Lab**: Implement ReAct prompting loop
4	Agent Architectures	Perception → cognition → action loop; Planning modules; Controller architectures; Reactive vs deliberative agents **Lab:** Build a basic agent loop
5	Tool Use and Action Execution	Function calling; API integration; External tools; Environment interaction **Lab:** Tool-using agent
6	Memory and Knowledge Integration	Short-term vs long-term memory; Vector databases Retrieval-Augmented Generation; Knowledge grounding **Lab:** RAG-enabled agent
7	Classical Decision-Making Foundations	Decision theory; Utility functions; Markov Decision Processes; Planning under uncertainty **Lab:** Planning simulation
8	Multi-Agent Systems	Cooperation and coordination; Communication protocols; Task decomposition; Orchestrator agents **Lab:** Multi-agent workflow
9	Agent Engineering Frameworks	Overview of frameworks; Workflow orchestration; Engineering best practices **Lab:** Framework-based agent
10	Human-in-the-Loop and Safe Autonomy	Human oversight; Approval mechanisms; Guardrails; Risk mitigation **Lab**: Human-controlled agent pipeline
11	Evaluation and Deployment	Performance evaluation; Testing agent behavior; Reliability and robustness; Deployment considerations **Lab**: Agent evaluation experiments
12	Ethics, Governance, and Future Directions	Responsible AI; Societal impact; Regulatory considerations; Emerging research directions **Final Project Presentations**

Details on assessment tools:

Course Project

Students design and implement a domain-specific agentic system, such as:

- Autonomous research assistant
- Software engineering agent
- Mobility planner
- Smart-city decision agent

- Digital-twin operator

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3: Knowledge base in specific domain	Advanced / applied
Problem analysis	PA-2 Modelling PA-3 Problem solving	Advanced / applied
Investigation	INV-1 Background and hypothesis formulation INV-2 Designing experiments	Advanced / applied
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Advanced / applied
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Advanced / applied
Ethics and equity	EE-1 Professional ethics and accountability	Advanced / applied

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
CLO 1: Explain core concepts of agentic AI systems.	KB-3
CLO 2: Design agent architectures with perception, memory, planning, and action.	DE-1, DE-2, DE-3, DE-4
CLO 3: Implement agents using modern frameworks.	INV-1, INV-2, UET-1
CLO 4: Integrate external tools and knowledge sources. Develop multi-agent workflows.	PA-2, PA-3, UET-1, UET-2, UET-3
CLO 5: Evaluate performance, reliability, and risks. Apply ethical and safety principles and the general principle of responsive use of AI.	INV-3, INV-4, EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 346 Operating Systems (4 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
This course covers the following topics: Fundamentals of operating system functionalities, design and implementation; multiprogramming (processes and threads, context switching, queuing models and scheduling); interprocess communication and synchronization; principles of concurrency; synchronization primitives; deadlock detection and recovery, prevention and avoidance schemes; memory management; device management; file systems; and protection models and schemes.

Components: Lecture 3 hours per week; Tutorial 1 hour per week; Laboratory 2 hours per week

Prerequisites: AI 228; AI 352
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- The hardware structure of modern computers, the role of the different parts (CPU, main memory, secondary memory, system bus, peripheral devices), the inter-connections between the different parts, and how the different parts interact to support computation, communication, and storage.
- The binary number system, basic arithmetic and logical operations on binary numbers, and converting binary numbers to decimal and vice-versa.
- The hardware-software interface including assembly language programming, accessing registers and main memory from software, I/O instructions, interrupts and interrupt handling, etc.
- Common data structures such as queues, stacks, lists, prioritized lists, etc. Implementation of such data structures using arrays, dynamic arrays, and linked-lists. Evaluation of algorithmic complexity of the operations.
- Fundamentals of operating system functionalities, design and implementation.
- The important skills needed to do well in this course include: 1) good programming skills, including the ability to understand, design, implement, and debug programs with non-obvious flow of control, 2) the ability to understand tradeoffs using a mix of qualitative and quantitative reasoning of design choices, 3) the ability to relate the theoretical material covered in class to the practical aspects of implementation, and 4) the ability to abstract the knowledge learnt and apply it to a wide range of problems (not necessarily related to operating systems, or even computer science for that matter).

Course materials
Required Textbook: *Operating System Concepts, 10th ed.;* Silberschatz/Galvin/Gagne; John Wiley & Sons; 2018.

Other references:

- Operating Systems, 3rd ed. (or 2nd ed.); Gary Nutt, Addison-Wesley.
- Applied Operating System Concepts, 1st ed.; Silberschatz/Galvin/Gagne; John Wiley & Sons, 2000.

Grading Scheme

Assessment tool	Weight
Theoretical assignments (individual)	N/A
Programming assignments	20%
Midterm exam	25%
Final exam	55%
Total	100%

Tentative Course Schedule

Week	Topic
1	Introduction – OS Overview
1 and 2	I/O Systems & OS Structures
3	Processes & Threads
4	Process Synchronization
4 and 5	Process Synchronization
6 to 8	High-Level Synchronization
8 and 9	Memory Management
9 and 10	Virtual Memory
10 and 11	Scheduling
11 and 12	File management and Deadlock

Details on assessment tools:

Programming Assignments: 20%
There will be 3 or 4 programming assignments. These assignments are designed to give you more understanding of the course material and to give you practices into aspects of operating system design and implementation. The assignments are using the Java language under Linux operating system. More information on the specific compiler version as well as where it is located in the system will be provided during lab times. You are allowed to work either individually or in a group of two at most. No additional marks are given for working individually. Reasonable attempts of all these assignments are necessary for passing the course.

Important: A demo will take place with the markers afterwards. Markers will inform you about the details of demo time and how to book a time slot for your demo. If working in a group, both members must be present during demo time. Different marks may be assigned to teammates based on this demo.

Submission format: For the programming assignments, all assignment-related submissions must be adequately archived in a ZIP file using your ID(s) and last name(s) as file name. The submission itself must also contain your name(s) and student ID(s). Use your “official” name only - no abbreviations or nick names; capitalize the usual “last” name. Inappropriate submissions will be heavily penalized. Submit only one copy per group for the programming assignments.

Theoretical Assignments

There will be a total of 3 or 4 theoretical assignments, which must be done individually. These assignments will not be marked (or only selected questions may be marked) and hence may not evaluate to any load of the course. The main purpose behind these assignments is to provide you with good preparation for the final. You are required to submit all of these assignments before the term's last day of classes. Although these assignments may not represent any load after all, failing to submit any of these assignments will cost you some "significant" marks (up to 20 marks). Additionally, these assignments must be typed and submitted online on Moodle Scanned Hand-written assignments will be discarded.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
A knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate
Design	DE-1 Define the objective DE-2 Idea generation and selection DE-3 Detailed design DE-4 Validation and implementation	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1.Understand fundamental operating system abstractions such as processes, threads, files, semaphores, inter process communication (IPC) abstractions, shared memory regions, etc.	KB-3
2. Understand how the operating system abstractions can be used in the development of application programs, or to build higher level abstractions and be able to apply these concepts for their practical applications.	DE-1, DE-2
3. Understand how the operating system abstractions can be implemented.	DE-3, DE-4
4. Understand the principles of concurrency and synchronization, and apply them to write correct concurrent programs / software.	DE-1, DE-2, DE-4
5. Understand basic resource management techniques (scheduling or time management, space management) and principles ad how they can be implemented. These also include issues of performance and fairness objectives and avoiding deadlocks.	DE-1, DE-2, DE-4

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 350 Computer Architecture for AI (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the hardware principles that influence the execution of AI workloads. Students learn how machine learning computations map onto modern hardware platforms such as CPUs, GPUs, and AI accelerators. Topics include parallel processing, memory hierarchies, data movement, numerical precision formats, and performance considerations for large-scale AI models. The course helps students understand the capabilities and limitations of computing platforms used to train and deploy AI systems.

Components: Lecture 3 hours per week

Prerequisites: AI 228, AI 300, AI 330 or AI 332
Co-requisites: N/A

Course materials
Required Textbook: *Computer Architecture, A Quantitative Approach, 7th ed.*; John L. Hennessy, David A. Patterson, Christos Kozyrakis; 2025

Grading Scheme

Assessment tool	Weight
Assignments	10%
Midterm Exam	35%
Final Exam	55%
Total	100%

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced
Problem analysis	PA-4 Analysis (uncertainty and incomplete knowledge)	Advanced
Investigation	INV-2 Designing experiments INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Advanced
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resource	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
CLO 1: Explain how core computer architecture concepts—such as memory hierarchies, parallel processing, and numerical representation—affect the execution of machine learning workloads.	KB-3
CLO 2: Evaluate performance trade-offs in AI systems by considering factors such as data movement, memory bandwidth, computational throughput, and energy efficiency.	PA-4, INV-4
CLO 3: Interpret architectural features of modern AI hardware (e.g., tensor cores, vector units, specialized accelerators) and explain how they influence model training and inference performance.	INV-4
CLO 4: Apply basic performance analysis techniques to assess the suitability of computing platforms for different AI workloads.	INV-2, INV-3, INV-4, UET-1,

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 352 Data Structures and Algorithms (3 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD

Course Calendar Description:
Mathematical introduction: mathematical induction, program analysis, and algorithm complexity. Fundamental data structures: lists, stacks, queues, and trees. Fundamental algorithms: hashing and sorting. Graph structures and algorithms. Overview of algorithm design techniques, including greedy algorithms, divide and conquer strategies, recursive and backtracking algorithms, and heuristics. Application of data structures and algorithms to engineering.

Components: Lecture 3 hours per week, Tutorial 1 hour per week

Prerequisites: AI 231, AI 249
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Object oriented programming design and development
- Program debugging and trouble shooting
- Programming comments and software development tools

Course materials
Required Textbook: *Algorithms, 4th ed.;* Robert Sedgewick, Kevin Wayne, Addison-Wesley

Other references:
- Text book's publisher online resources: https://algs4.cs.princeton.edu/home/
- *Data structures and Algorithms in Java* by Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser

Grading Scheme

Assessment tool	Weight
Assignment 1	5%
Assignment 2	5%
Assignment 3	8%
Assignment 4	7%
Midterm exam	20%
Final exam	55%
Total	100%

Tentative Course Schedule

Week	Topic	Reference
1	Course description Analysis of algorithms	Course outline 1.4
2	Analysis of algorithms (cont.) Recursion	1.4 Notes
3	Stacks and Queues	1.3
4	Elementary Sorts	2.1
5	Merge Sort Quick Sort	2.2 2.3
6	Priority Queues & Heap	2.4
7	Midterm Priority Queues & Heap (cont.)	 2.4
8	Symbol Tables Binary Search Trees	3.1 3.2
9	Balanced Search Trees	3.3
10	Hash Tables	3.4
11	Graphs and Graph-based Algorithms	4.1 & 4.2
12	Graphs and Graph-based Algorithms (cont.) Review session	4.3 All chapters

Engineering Tools

- IDEs that support Java Programming

Details on assessment tools:

Assignments

There will be four (4) assignments worth 25% of the total grade. Instructions on how to package and submit the assignments will be posted on the course website. All assignments involve algorithmic design and computer programming. For all programming components of your assignments, you need to use Java. Each assignment covers one or more topics. Submitted assignment solutions that are up to 24 hours late will suffer a 50% deduction; more than that: 100%.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Intermediate
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
1. Learn Java and (possibly) the Java Collections library, in order to implement solutions in Java and where appropriate using Java Collections	KB-3
2. Design algorithmic solutions to problems, solutions involving data structure and their manipulation through algorithms	KB-3, PA-1, PA-2, PA-3
3. Faithfully implement these solutions as correct object-oriented programs	PA-1, PA-3
4. Work effectively to create, implement and demonstrate a program solution to an open-ended and challenging problem. Further enhance specific graduate attributes (engineering knowledge, problem analysis and life-long learning) in the context of data structures and algorithms	PA-1, PA-2, PA-3, PA-4

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 370 AI System Design (3 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course focuses on the design, deployment, and maintenance of end-to-end AI systems. Moving beyond model-centric perspectives, it examines how machine learning components interact with data pipelines, software infrastructure, and operational constraints in real-world applications. Topics include problem formulation, data collection and annotation, evaluation metrics, system and model optimization, deployment on cloud and edge platforms, monitoring and lifecycle management, MLOps, and issues of ethics, security, and sustainability. This course also covers system-level trade-offs among accuracy, efficiency, cost, robustness, and energy consumption.

Components: Lecture 3 hours per week, Laboratory 1 hour per week

Prerequisites: AI 330 or AI 332, AI 334
Co-requisites: N/A

Grading Scheme

Assessment tool	Weight
Assignments	30%
Exams	30%
Project	40%
Total	100%

Tentative Course Schedule
Week 1: Introduction to AI Systems
Week 2: Problem Formulation and Objective Design
Week 3: Data-Centric AI and Data Optimization
Week 4: Metrics, Evaluation, and System-Level Validation
Week 5: Model Selection and Training Optimization
Week 6: Model Efficiency and Inference Optimization
Week 7: AI System Architecture and Pipeline Optimization
Week 8: Deployment and Serving Optimization
Week 9: Monitoring, Maintenance, and Lifecycle Optimization
Week 10: MLOps and Reproducible Optimization
Week 11: Trustworthy, Secure, and Sustainable AI Systems
Week 12: Case Studies and Emerging Directions

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Problem analysis	PA-1 Problem identification and formulation PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate / developed
Investigation	INV-3 Conducting experiments and collection of data	Intermediate / developed
Design	DE-3 Detailed design DE-4 Validation and implementation	Intermediate / developed
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources	Intermediate / developed
Ethics and equity	EE-1 Professional ethics and accountability	Intermediate / developed

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Formulate AI system objectives and requirements, including constraints related to data, infrastructure, deployment, and performance.	PA-1
Design and critique data collection, annotation, and data-centric optimization pipelines for real-world AI applications.	PA-4
Select and apply appropriate evaluation metrics and system-level validation strategies to assess end-to-end AI system performance.	INV-3
Analyze and implement model training and optimization techniques, balancing accuracy, efficiency, robustness, and cost.	PA-4
Architect complete AI pipelines, integrating data processing, model training, inference components, and system-level optimizations.	DE-3, DE-4
Deploy AI models on cloud, distributed, and edge platforms, considering latency, throughput, scalability, and resource constraints.	UET-1
Implement monitoring, maintenance, and lifecycle management strategies consistent with modern MLOps practices.	UET-1
Evaluate and address ethical, security, trustworthiness, and sustainability considerations in the design and deployment of AI systems.	EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 380 Trustworthy and Safe AI (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces foundational principles and engineering methodologies for developing trustworthy and safe Artificial Intelligence (AI) systems. Students examine trustworthiness and safety principles for AI systems, explainability and interpretability, fairness and bias, transparency and accountability, social value alignment, and AI risk management frameworks. The course also explores the adversarial landscape for AI systems, including adversarial AI threats, model and content provenance, and AI-driven misinformation and disinformation. Through technical methods and practical examples, students learn how to evaluate, analyze, and improve the trustworthiness and safety properties of AI systems across application domains.

Components: Lecture 3 hours per week

Prerequisite: AI 330 or AI 332
Co-requisite: AI 370

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine Learning Fundamentals: Supervised and unsupervised learning, model training and evaluation, overfitting and regularization.
- Probability and Statistics: Knowledge of random variables, probability distributions, and hypothesis testing.
- Programming Skills: Proficiency in Python and experience with at least one ML framework (e.g., PyTorch).
- Software Engineering Basics: Modular design, debugging, testing, and version control.

Course materials
Recommended Textbooks:
- *Responsible AI: Best practices for creating trustworthy AI systems*; Lu, Q., Zhu, L., Whittle, J., & Xu, X.; Addison-Wesley Professional; 2023.
- *Trustworthy AI: From theory to practice*; Catak, F. O., & Kuzlu, M.; 2024

In addition to the required textbook, students will be provided with the following materials to support their learning:
- Research Papers: A curated list of seminal papers to be posted on the course website.
- Software Tools: PyTorch, scikit-learn, MLflow, Pandas/NumPy/Matplotlib, GitHub
- Lecture Slides: Will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	Weight

Assignments	35%
Midterm Exam	25%
Final Exam	40%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Foundations of Trustworthiness and Safety	Definitions and dimensions of trustworthy AI; safety vs. reliability; socio-technical perspectives; trust in AI systems
2	Trustworthiness and Safety Principles	Robustness, reliability, fairness, transparency, accountability, privacy, and human oversight principles
3	Explainability and Interpretability	Model-specific vs. model-agnostic explanations; feature attribution; local/global explanations; limitations of interpretability methods
4	Fairness and Bias in AI Systems	Sources of bias, fairness metrics, disparate impact, bias detection and mitigation techniques
5	Social Value Alignment	Value alignment problem; human-centric AI; alignment challenges in generative and decision-making systems
6	Transparency and Accountability	Documentation practices; auditability; traceability; accountability mechanisms; human-in-the-loop governance
7	AI Risk Management Frameworks	NIST AI Risk Management Framework: Risk identification and categorization; impact and likelihood assessment; AI lifecycle risk management approaches
8	Adversarial Landscape for AI Systems	Threat models; attack surfaces in ML pipelines; robustness evaluation; system-level implications; MITRE ATLAS knowledge base
9	Adversarial AI Threats	Evasion; poisoning; model extraction; prompt injection; detection and mitigation strategies
10	Model and Content Provenance	Data lineage; model versioning; watermarking; provenance tracking; authenticity verification
11	AI Misinformation and Disinformation	Generative AI risks; Deepfake; AI-based spoofing; synthetic data detection; societal and security implications
12	Practical Case Studies in Trustworthy and Safe AI	Analysis of real-world deployments, governance challenges, lessons learned, and bridging to resilient AI systems

Engineering Tools

- Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:
- PyTorch: Model development, robustness testing, interpretability experiments.
- scikit-learn: Baseline models, fairness evaluation, validation workflows.
- Explainability Libraries (e.g., SHAP, LIME): Feature attribution and model interpretability analysis.
- Fairness Toolkits (e.g., AI Fairness 360): Bias detection and mitigation experiments.

- Adversarial Robustness Libraries (e.g., CleverHans, Foolbox): Evaluation of adversarial vulnerabilities and defences.
- Provenance & Model Management Tools (e.g., MLflow): Tracking model lifecycle.
- Synthetic Media Detection Tools (research toolkits or open-source detectors): Evaluation of misinformation and deepfake content.
- Python Scientific Stack (NumPy, Pandas, Matplotlib): Statistical analysis and visualization

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	**Indicators**	**Level of coverage**
Knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced
Problem analysis	PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Advanced
Investigation	INV-4 Analysis and interpretation of data	Advanced
Use of engineering tools	UET-1 Ability to use appropriate engineering tools, techniques and resources UET-2 Ability to select appropriate tools, techniques, and resources	Advanced
Professionalism	PR-2 Professional practice	Intermediate
Impact of engineering on society and the environment	IES-1 Awareness of society and environment impact	Advanced
Ethics and equity	EE-1 Professional ethics and accountability	Advanced

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	**Related Graduate Attribute and Indicator**
1: Explain and differentiate key dimensions of trustworthy and safe AI, including fairness, transparency, accountability, robustness, and value alignment	KB-3
2: Analyze and quantify bias, uncertainty, explainability, and risk in AI systems using appropriate computational and statistical techniques	PA-3, PA-4, UET-1, UET-2
3: Evaluate AI systems against adversarial threats and misinformation risks and assess mitigation strategies	PA-3, INV-4
4: Apply AI risk management frameworks and provenance mechanisms to support transparency and accountability across the AI lifecycle	PA-3, INV-4, EE-1
5: Assess real-world AI deployments and articulate engineering trade-offs among performance, safety, trustworthiness, and societal impact	IES-1, PR-2

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 392 AI and Society (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces students to the broader societal contexts that shape and are shaped by artificial intelligence (AI). Students learn to view AI as part of larger social, economic, and environmental systems that influence how AI technology is developed and deployed, and how engineers can respond to these challenging questions in responsible and ethical ways. Students learn about transparency, privacy, ethics, human rights, AI policies, regulations and governance. Students also learn to apply responsible innovation frameworks and the human rights AI impact assessment on case studies. Lectures: three hours per week.

Components: Lecture 3 hours per week

Prerequisites: ENCS 282
Co-requisites: N/A

Course materials
Readings, selected book chapters, international reports, documentaries, films and interviews, will be part of assignments and class activities and preparation for the midterm evaluation. Independent literature research will be required for the project. The lists below show an incomplete selection of resources.

Book chapters

- Karen Hao, “Empire of AI. Dreams and Nightmares in Sam Altman's OpenAI” (Penguin Press, 2025)
- Kate Crawford, “Atlas of AI” (Yale University Press, 2021)
- Ruha Benjamin, “Race After Technology” (Polity, 2019)
- Virginia Eubanks, “Automating Inequality” (Picador, 2019)
- Safia Umoia Noble, “Algorithms of Oppression” (NYU press, 2018)
- Amy Webb, “The Big Nine”, (PublicAffairs, 2020)

Online resources

- AI Now Institute https://ainowinstitute.org/
- AI for good (UN platform on AI) https://aiforgood.itu.int/
- Human Rights AI Impact Assessment https://www3.ohrc.on.ca/en/human-rights-ai-impact-assessment
- Kate Crawford and Vladan Joler (2023) “Calculating Empires” https://calculatingempires.net/
- “Coded bias” documentary on Netflix https://www.netflix.com/ca/title/81328723
- “Responsible Research and Innovation explained” (European Union) https://rri-tools.eu/
- “Algorithmic Justice League” https://www.ajl.org/
- “Gendered Innovations” https://genderedinnovations.stanford.edu/

- “Last week tonight with John Oliver” (HBO) (“Housing discrimination”, “Facial recognition”, “Police”, “Government surveillance”, and many others.) https://www.youtube.com/show/SC1Dd2OxhAzUXWuhFBFecIAA?season=1&sbp=CgEx
- “AI, Ain’t I a Woman?” Joy Buolamwini (youtube) https://www.youtube.com/watch?v=QxuyfWoVV98
- “Atlas of AI: Kate Crawford in conversation with Judy Wajcman” (youtube) https://www.youtube.com/watch?v=a7Tx-yHHEYo&t=1516s

Reports, declarations, and articles

- Universal Declaration of Human Rights https://www.un.org/en/about-us/universal-declaration-of-human-rights
- Sustainable Development Goals https://sdgs.un.org/goals
- Stanford’s AI100 Report https://ai100.stanford.edu/
- UNESCO’s report on artificial intelligence and gender equality https://en.unesco.org/AI-and-GE-2020
- What Really Happened When Google Ousted Timnit Gebru (Wired, June 2021) https://www.wired.com/story/google-timnit-gebru-ai-what-really-happened/
- Are These Tech Companies Complicit In Human Rights Abuses Of Child Cobalt Miners In Congo? (Forbes, January 2020) https://www.forbes.com/sites/ewelinaochab/2020/01/13/are-these-tech-companies-complicit-in-human-rights-abuses-of-child-cobalt-miners-in-congo/?sh=2abbb28c3b17
- Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., ... & Nerini, F. F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. Nature communications, 11(1), 1-10. https://www.nature.com/articles/s41467-019-14108-y
- Zou, J., & Schiebinger, L. (2018). AI can be sexist and racist—it’s time to make it fair. https://www.nature.com/articles/d41586-018-05707-8
- Brundage, M., Avin, S., Clark, J., Toner, H., Eckersley, P., Garfinkel, B., ... & Amodei, D. (2018). The malicious use of artificial intelligence: Forecasting, prevention, and mitigation. https://arxiv.org/ftp/arxiv/papers/1802/1802.07228.pdf
- Buolamwini, J. & Gebru, T., “Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification”. Proceedings of Machine Learning Research 81:1–15, 2018 https://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf

Grading Scheme

Assessment tool	**Weight**
Mini-assignments (short quizzes on class content)	20%
Midterm knowledge evaluation	35%
Presentation of project plan and topic (group assignment)	15%
Final project in-class presentation (group assignment)	15%
Final project video (group assignment)	15%
Total	100%

Tentative Course Schedule

Slight modifications might occur based on the specific interest of students and in response to current events and developments.

Week	Input
1	Introduction to AI and Society
2	History of AI in society
3	Datasets, algorithms and classification
4	Bias and transparency
5	Environment and planetary costs
6	Data labor, data business
7	AI and Democracy
8	AI Ethics
9	Governance, policy, and regulations
10	Responsible research and innovation
11	AI Human Rights Impact Assessment
12	Final Project Presentations

Details on assessment tools:

Mini-assignments (20%)

These mini-assignments will be short presentations, handwritten reflections on in-class discussions, quizzes, etc. The mini-assignments will be unannounced and completed in class.

Midterm knowledge evaluation (35%)

The midterm knowledge evaluation will give you to opportunity to demonstrate what you have learned in the course.

Group assignment

There will be one major group assignment consisting of a presentation of the project topic and plan, an in-class presentation of the project and a final project video.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of learning
Knowledge base in engineering	KB-3 Knowledge base in specific domain	Intermediate
Professionalism	PR-1 Role and responsibilities of professional engineers PR-2 Professional practice	Intermediate
Impact of engineering on society and the environment	IES-1 Societal impact of engineering IES-2 Sustainability and environmental stewardship	Intermediate
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Understand the larger social, economic, and environmental context of AI	IES-1, IES-2
Articulate current societal concerns related to AI	IES-1, EE-1, EE-2
Reflect engineering practice and research in AI development	KB-3
Gain knowledge of policies, regulations, legislations and institutional frameworks	PR-1, PR-2
Develop skills to perform a human rights impact assessment of AI systems	EE-2
Apply responsible research and innovation (RRI) practices on AI	PR-1, PR-2, EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 487 Artificial Intelligence and Machine Learning in Cybersecurity (3 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
The course introduces students to advanced topics of artificial intelligence and machine learning (AI/ML) in cybersecurity, including threats, risks, and mitigations for secure and trustworthy AI/ML deployment as well as threats, risks, and mitigation against adversarial AI/ML like DeepFake and others targeting security, privacy, and other applications. In addition, the course covers the ethical aspects and responsible use of AI and machine learning in cybersecurity such as ethical foundations, societal impact, transparency, accountability, safety, security and data and privacy governance.

Components: Lecture 3 hours per week

Prerequisites: AI 300
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming (Python)
- Basic concepts and algorithms of artificial intelligence and machine learning
- Technical writing and reporting

Course materials
Suggested Textbook: To be determined based on the specific projects available each term.
Instructor's lecture notes: Will be posted on the Moodle course site.
Software use: To be determined based on the specific case studies available each term

Grading Scheme

Assessment tool	Weight
Assignments	10%
Midterm quiz	25%
Project	25%
Final exam	40%
Total	100%

Tentative Course Schedule

Week	Modules
1	Introduction to the AI/ML Ecosystem and Cybersecurity Implications
2-3	Cyber Threats to AI/ML: Poisoning and Evasion Attacks
4-5	Cyber Threats to AI/ML: Model Inference and Other Threats
6	Risk Assessment and Management for AI/ML Systems
7	Midterm Quiz
7-8	Adversarial Machine Learning and Their Cybersecurity Implications

9-10	Adversarial AI/ML in Broader Context: DeepFake, Privacy and Beyond
11	Building Secure, Ethical, Responsible, Explainable and Trustworthy AI/ML
12	Project Presentations

Graduate Attributes:
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate attribute	Indicators	Level of coverage
A knowledge base for engineering	KB-3 Knowledge base in specific domain	Advanced
Problem analysis	PA-1 Problem identification and formulation PA-2 Modelling PA-3 Problem solving PA-4 Analysis (uncertainty and incomplete knowledge)	Intermediate
Investigation	INV-3 Conducting experiments and collection of data INV-4 Analysis and interpretation of data	Intermediate
Use of engineering tools	UET-1 Ability to use appropriate engineering tools and resources UET-2 Ability to select appropriate tools, techniques, and resources UET-3 Demonstrate awareness of limitations of tools, create and extend tools as necessary	Advanced
Communication skills	COM-1 Writing process COM-2 Information gathering COM-3 Documentation COM-4 Oral presentation	Intermediate
Individual and team work	ITW-1 Cooperation and work ethics ITW-2 Contribution: practical / conceptual ITW-3 Initiative and leadership ITW-4 Team dynamics	Intermediate
Ethics and equity	EE-1 Professional ethics and accountability EE-2 Equity	Intermediate
Life-long learning	LL-1 Identifying missing knowledge and learning opportunities LL-2 Continuous improvement and self-learning	Intermediate

Course Learning Outcomes (CLOs):
By the end of this semester, students can expect to acquire the following skills:

Course Learning Outcomes (CLOs)	Related Graduate Attribute and Indicator
Describe advanced cybersecurity principles and practices for AI/ML systems	KB-3
Identify and describe cybersecurity requirements, risks, and mitigations for AI/ML systems	PA-1, PA-2, PA-4, COM-2, COM-3
Identify and describe security models, standards, controls and countermeasures to protect AI/ML systems against cyber threats	PA-2, UET-2, UET-3, COM-2, COM-3, LL-1, LL-2

Apply ethical and safety principles and the general principle of responsive use of AI in cybersecurity.	INV-3, INV-4, EE-1

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI Elective Courses

AI 401 Edge AI (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: Please see your class schedule for details

Course Calendar Description:
This course provides a comprehensive study of deploying Artificial Intelligence (AI) and Machine Learning (ML) models on resource-constrained embedded systems and edge devices. It examines the challenges imposed by tight power, memory, and computational budgets, and introduces key model optimization techniques such as weight clustering, low-rank adaptation, and pruning. The course also covers efficient neural network architectures for edge inference and deployment frameworks for both microcontroller-based and GPU-based edge platforms. Through a combination of foundational TinyML concepts and broader system-level perspectives from modern Edge AI concepts, students gain hands-on experience deploying and evaluating AI models on industry-standard platforms such as ARM Cortex-M microcontrollers or NVIDIA Jetson devices. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 350
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Embedded Systems Fundamentals: Understanding of microcontroller architectures, memory-mapped I/O, interrupts, and real-time constraints.
- Machine Learning Basics: Understanding of supervised learning, neural network fundamentals (CNNs, RNNs), loss functions, and training procedures.
- Programming Skills: Basic proficiency in Python and C/C++.

Course materials
Required Textbook: *TinyML: Machine Learning with TensorFlow Lite on Microcontrollers*; Warden, P., & Situnayake, D.; O'Reilly Media; 2019

Recommended references:
- *Designing Machine Learning Systems: An Iterative Process for Production-Ready Applications*; Huyen, C.' O'Reilly Media; 2022.
- *AI at the Edge*. Daniel Situnayake & Jenny Plunkett. O'Reilly Media, 2023.

Additional Course Materials: In addition to the textbooks, students will be provided with curated research papers, technical documentation, and software tutorials to cover advanced topics such as GPU-based edge platforms, neural architecture search, and federated learning

Lecture Slides: Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	45%
Design Project	35%
Total	100%

Tentative Course Schedule

Week	Topic	Description & Key Concepts
1	Introduction to Edge AI and Deployment Platforms	Cloud vs. Edge AI; motivations (latency, privacy, bandwidth); overview of edge platforms and use cases; introduction to deployment targets such as ARM Cortex-M microcontrollers and NVIDIA Jetson; overview of Edge AI toolchains and the overall deployment process.
2	Edge Platforms and Embedded Constraints	Microcontroller architectures (ARM Cortex-M); memory and power constraints; real-time considerations; characterization of edge workloads on target hardware; measurement of memory footprint, latency, and power consumption.
3	DNN Fundamentals for Edge I	Review of neural networks for edge inference (CNNs, RNNs, and Transformers); computational and memory requirements; analysis of model components that dominate computation and memory usage.
4	DNN Fundamentals for Edge II	Data representation; fixed-point and integer formats; model representation and parameter storage; encoding mechanisms (e.g., weight sharing and Huffman coding); impact on memory footprint and inference efficiency.
5	Model Quantization and Weight Clustering	Post-training quantization; quantization-aware training; INT8, INT4, and mixed-precision inference; accuracy–performance trade-offs.
6	Pruning and Sparsity	Structured and unstructured pruning; sparsity patterns; Magnitude-based and gradient-based methods; Hardware support for sparse inference.
7	Knowledge Distillation Midterm Exam	Teacher-student frameworks; soft labels and temperature; feature-based and attention-based distillation; trade-offs between accuracy and model size.
8	Efficient Architectures I	Depthwise separable convolutions; MobileNet V1/V2/V3; ShuffleNet; Inverted residuals.
9	Efficient Architectures II	EfficientNet and compound scaling; SqueezeNet; Neural Architecture Search (NAS) for edge devices.
10	Deployment Frameworks	TensorFlow Lite; ONNX Runtime; PyTorch Mobile; Model conversion and deployment pipelines.
11	GPU-Based Edge Platforms	NVIDIA Jetson family; TensorRT optimization; CUDA basics for edge; Performance benchmarking.

12	Applications & Future Trends	Edge AI applications (vision, audio, sensors); Federated learning; On-device training; Emerging hardware.

Project Details
The project component of this course provides hands-on experience with Edge AI systems through a progressive approach. Students begin by deploying a pre-built reference neural network on a real edge platform to become familiar with the hardware, software toolchain, and execution workflow. Once the deployment environment is mastered, students progressively analyze, modify, optimize, and redeploy the model by applying concepts introduced throughout the course, including model compression and efficient architecture techniques.

Project Expectations:
The project is expected to address the following phases:

- **Initial Deployment and Platform Familiarization**: Deployment of a provided, pre-built neural network model on an edge platform (ARM Cortex-M microcontroller or NVIDIA Jetson). Familiarization with the toolchain, runtime environment, and deployment workflow.
- **Model Characterization**: Measurement and analysis of memory footprint, latency, and (when applicable) power consumption of the deployed model on target hardware.
- **Model Analysis**: Profiling the original, uncompressed model to analyze computational complexity, memory footprint, and inference performance.
- **Model Optimization**: Progressive application of optimization techniques such as pruning, quantization, encoding, and/or architectural modifications.
- **Redeployment and Evaluation:** Deployment of the optimized model on the target platform and evaluation of improvements relative to the initial deployment.

Project Documentation and Instructions:
Project guidelines and setup instructions for the required tools and hardware platforms will be available on the course Moodle site to support the deployment-first project workflow.

Engineering Tools
Students will be introduced to and utilize the following industry-standard engineering tools throughout the course:

- **TensorFlow Lite:** Framework for deploying machine learning models on mobile, microcontrollers, and edge devices.
- **ONNX Runtime:** Cross-platform inference engine for deploying models in ONNX format.
- **PyTorch/TensorFlow:** Primary frameworks for model design, training, and optimization experimentation.
- **Edge Impulse Studio:** End-to-end platform for developing embedded ML applications.
- **NVIDIA TensorRT:** SDK for high-performance deep learning inference on NVIDIA GPUs.
- **ARM CMSIS-NN:** Optimized neural network kernels for ARM Cortex-M processors.
- **Profiling Tools:** Power monitors, memory analyzers, and latency profilers for embedded systems.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Evaluate edge AI platforms and their constraints for specific AI workloads.
CLO 2: Implement efficient DNN models using compression techniques such as weight clustering, low-rank, and pruning.
CLO 3: Compare and select edge-optimized neural network architectures.
CLO 4: Deploy and benchmark AI models using TensorFlow Lite, ONNX Runtime, or PyTorch Mobile.
CLO 5: Explore emerging Edge AI applications and on-device learning techniques.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 411 AI Hardware Accelerators (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course provides an in-depth study of hardware architectures and systems designed to efficiently accelerate Deep Neural Networks (DNNs) and modern AI workloads. Students examine the computational, memory, and energy challenges posed by large-scale models, including data movement bottlenecks and the memory wall. Topics include accelerator architectures and dataflow optimizations, hardware-aware model compression techniques (quantization, pruning, sparsity), and case studies of industrial platforms such as Google TPU, NVIDIA NVDLA, and emerging AI accelerators. The course also covers distributed machine learning systems and hardware–software co-design approaches that reduce computation and communication costs. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 350
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics:

- **Digital System Design:** Proficiency in combinational and sequential logic, finite state machines (FSM), and timing analysis.
- **Hardware Description Languages (HDL):** Experience in designing and simulating hardware modules using VHDL/Verilog or SystemVerilog.
- **Computer Architecture:** Understanding of memory hierarchies (caches, buffers, DRAM), pipelining, and ISA (Instruction Set Architecture) fundamentals.
- **Machine Learning Basics:** Understanding of supervised learning, neural network fundamentals, loss functions, and training procedures.

Course materials
Required Textbook: *Efficient Processing of Deep Neural Networks*; Vivienne Sze, Yu-Hsin Chen, Tien-Ju Yang, and Joel S. Emer; Morgan & Claypool Publishers (Springer Nature), 1st Edition, 2020.

Other course materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- Research Papers: A curated list of seminal papers including the "Eyeriss" architecture, Google TPU (ISCA 2017), and NVIDIA NVDLA documentation
- Software Tools: * PyTorch: For DNN model design and exploration
- Accelergy & Timeloop: Infrastructure for evaluating the energy and performance of DNN accelerators
- Xilinx Vivado HLS: For High-Level Synthesis laboratory exercises
- Lecture Slides and Lab Manuals: Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	45%
Design Project	35%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to AI Hardware Architectures	Evolution of AI computing; CPUs vs. GPUs vs. Accelerators; Review of DNN layers (CNN, FC), Systolic Arrays basics
2	FPGA based AI Hardware Accelerator	Instruction Set Architecture (ISA); Matrix Multiply Unit design; introduction to hardware-software co-design; Performance analysis
3	Model Quantization	Number formats (INT8, FP16, Bfloat16); Linear/Non-linear quantization; Impact on area and energy
4	Stationary Dataflows I	Analysis of Weight-Stationary (WS) and Output-Stationary (OS) flows; Data reuse strategies
5	Stationary Dataflows II	Row-Stationary (RS) dataflow; Case study of the Eyeriss architecture and hierarchical memory
6	Memory Hierarchy Design	On-chip buffers (Scratchpads); Global buffers; Network-on-Chip (NoC) for data distribution
7	Sparsity and Pruning Midterm Exam	Structured vs. Unstructured pruning; Hardware support for zero-skipping; Compressed storage (CSC/CSR)
8	Evaluation Metrics	Accuracy, Latency, Throughput; Energy efficiency (J/op); The "Memory Wall" challenge. Benchmarks.
9	Case Study: Google TPU	Instruction Set Architecture (ISA); Matrix Multiply Unit (MXU) design; Performance analysis.
10	Advanced Industry Designs	Review of NVIDIA NVDLA (modular SoC) and SCNN (sparse CNN accelerator).
11	Emerging Paradigms	Processing-In-Memory (PIM); Neuromorphic computing basics.
12	Hardware-Aware NAS	Introduction to Neural Architecture Search; Designing DNNs for specific hardware latency targets.

Project Details
The project component of this course provides hands-on experience in designing, modeling, and evaluating AI hardware accelerators using industry-standard tools.

Project expectations:

- **Inference and DNN Model Design:** Introduction to DNN modeling in Python/PyTorch; analyzing computational complexity and estimating energy costs for various network architectures.
- **Kernel + Tiling Optimization:** Using tools like **Timeloop** and **Accelergy** to explore data reuse strategies and optimize tiling for different memory hierarchies.

- **Hardware Design & Mapping:** Designing a Systolic Array or a Matrix Multiplication Unit using **Verilog/SystemVerilog** or **High-Level Synthesis (HLS)**.
- **Sparse Accelerator Design:** Implementing and evaluating hardware techniques for zero-skipping and exploiting sparsity in weights and activations.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **PyTorch:** Utilized for designing Deep Neural Network (DNN) models and extracting workload characteristics (e.g., weights and activations) for hardware mapping.
- **Timeloop:** A systematic infrastructure for evaluating and exploring the architecture design space of DNN accelerators.
- **Accelergy:** An architecture-level energy estimation framework used in conjunction with Timeloop to quantify energy efficiency.
- **Xilinx Vivado HLS (High-Level Synthesis):** Used for transforming C/C++ specifications into Register Transfer Level (RTL) implementations for FPGA-based acceleration.
- **SystemVerilog/Verilog:** For RTL-level design and functional verification of Processing Elements (PEs) and memory interfaces.
- **Simulators:** Various architectural simulators for analyzing Network-on-Chip (NoC) traffic and memory bandwidth utilization.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Evaluate and quantify the energy, throughput, and latency trade-offs of various DNN hardware architectures.
CLO 2: Analyze and select optimal dataflow strategies (Row-Stationary, Weight-Stationary) for specific AI workloads.
CLO 3: Implement and assess hardware-aware model compression techniques, including quantization and pruning.
CLO 4: Utilize professional engineering tools (Timeloop, Accelergy, Vivado HLS) to simulate and optimize AI hardware.
CLO 5: Design a modular AI hardware accelerator and document its performance through technical reporting.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 412 AI for Wearable Health Applications (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces students to the design, development, and evaluation of artificial intelligence systems for health applications using wearable and large-scale sensor data. The course covers data acquisition, signal processing, feature engineering, machine learning, deep learning, large language models, and multimodal systems, with emphasis on clinical validation, ethical deployment, and personalized health monitoring.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Basic concepts of machine learning: Students should be familiar with classical machine learning concepts and models, specially supervised machine learning. Recommended resource: https://www.kaggle.com/learn/intro-to-machine-learning
- Signal processing: Students should understand basic signal processing concepts including frequency domain analysis, sampling, and filters. Recommended resource: https://matlabacademy.mathworks.com/details/signal-processing-onramp/signalprocessing
- Programming: Students should be proficient in programming, ideally with Python. Recommended resources:
- Intro to Python: https://colab.research.google.com/github/cs231n/cs231n.github.io/blob/master/python-colab.ipynb
- Advanced Python: https://colab.research.google.com/drive/1gCqFEquqNvEoTDX3SNhR2PZkXWPHKXnc?usp=sharing
- Working with Time Series: https://colab.research.google.com/github/jakevdp/PythonDataScienceHandbook/blob/master/notebooks/03.11-Working-with-Time-Series.ipynb

Course materials
Required Textbook: *Machine learning for healthcare technologies*. Clifton, D. A. The Institution of Engineering and Technology. Available online via Concordia Library: https://concordiauniversity.on.worldcat.org/oclc/962412218

Other suggested textbooks:

- Najarian, K., & Splinter, R. (2012). Biomedical Signal and Image Processing. CRC Press. Available online via Concordia Library https://concordiauniversity.on.worldcat.org/oclc/1030993403
- Labrador, M. A., & Lara Yejas, O. D. (2014). Human activity recognition : using wearable sensors and smartphones. CRC Press. https://concordiauniversity.on.worldcat.org/oclc/869311332
- de Vries, G., Blachman, J., O'Reilly for Higher Education (Firm), & Safari, an O'Reilly Media Company. (2020). The Patient Equation (1st edition). Wiley. https://concordiauniversity.on.worldcat.org/oclc/1266265767

Supplementary notes will also be provided.

Grading Scheme

Assessment tool	Weight
Participation, quizzes. tutorials	10%
Midterm Exam	30%
Final Exam	30%
Project	-
Assignments	30%
Total	100%

Tentative Course Schedule

Week	Topics / Activities
1	Introduction to AI healthcare and digital health. The role of wearables in digital health. Sense–Think–Act paradigm. Types of applications. Digital biomarkers.
2	Sensors and embedded data acquisition: Accelerometers and gyroscopes. ADCs, sampling, power constraints. Signal conditioning and filtering. Case study: Step detection.
3	Classical Machine Learning with Engineered Features. Windowing. Time/frequency feature extraction. Feature selection. Traditional classifiers. Case study: Activity recognition.
4	Deep Learning for Wearable Time-Series Data. CNNs, RNNs, and temporal convolutions. End-to-end learning. Case study: Activity classification.
5	Actuators and closed-loop health systems. Haptic, audio, and visual feedback. Control strategies. AI-driven interventions. Case study: Activity coaching system.
6	Actuators and closed-loop health systems. Haptic, audio, and visual feedback. Control strategies. AI-driven interventions. Case study: Activity coaching system.
7	Midterm Exam
8	Model evaluation and physiological interpretation. Optical and physiological sensors. PPG sensing principles. Signal quality assessment. Artifact removal. Case study: Heart rate estimation.
9	Representation Learning and Self-Supervised Learning for Health Data. Contrastive learning. Autoencoders. Foundation models for wearables.
10	Multimodal and large-scale health AI systems. Early and late fusion. Cloud–edge architectures. Population-scale modeling. Case study: Stress detection.
11	Ethical implications and regulations: privacy, ethics, user control. Understanding the effects on health. PIPEDA and Quebec's Law 25.
12	Embedded AI tools for wearables. – Final Review

Engineering Tools
Python
Wearable data acquisition platform (emotibit / max health band)

Project description:
The project component of this course provides hands-on experience in designing, modeling, and evaluating AI for wearable health applications.

Project expectations:
The project will be completed in three phases: proposal, model development, and personal data collection and evaluation. In the proposal phase, students will define a health or behavioral application, review relevant literature and datasets, and clearly describe the sensing, analysis, and action components of their system. In the model development phase, students will use a public dataset to design, train, and evaluate a machine learning model following a standard data processing and validation pipeline. In the final phase, students will collect and annotate personal sensor data using mobile or wearable devices, test their model in realistic

conditions, and demonstrate that the system's action or feedback component works. Projects must be feasible within the course timeline.

Other information

Teaching approach

The teaching approach for this course will be dynamic and inclusive, integrating a combination of interactive lecturing, case study discussions, small group activities and discussions, and coding tutorials designed to accommodate students with diverse preferences. During the lectures, there will be frequent opportunities for students to engage with the content, ask questions, check their knowledge and receive feedback. Tutorials will deepen or expand the concepts being taught during the lectures, often through a case study. This approach aims to create an engaging and supportive learning environment where all students can thrive.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following computer engineering concepts.

1. Describe the principles, limitations, and performance trade-offs of sensors and actuators used in wearable and embedded health systems.
2. Implement data acquisition, signal processing, and data engineering pipelines for AI-based analysis of physiological and behavioral data.
3. Develop machine learning, deep learning, and self-supervised learning models for health monitoring and prediction using wearable and multimodal data.
4. Evaluate end-to-end AI-enabled health systems using appropriate experimental design, performance metrics, and validation protocols.
5. Analyze ethical, privacy, regulatory, and societal implications of deploying AI systems in healthcare.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 415 Hardware Security for AI Systems (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course provides a comprehensive introduction to cybersecurity principles with a focus on hardware security in AI-enabled systems. It covers the hardware foundations of modern AI platforms, including GPUs, TPUs, and specialized AI accelerators, and examines fundamental hardware security primitives. Students analyze threat models and attack surfaces specific to AI hardware, including hardware Trojans, supply chain vulnerabilities, side-channel attacks, and fault injection techniques. The course also explores trust mechanisms for AI devices, memory security, data protection strategies, and trusted execution environments for AI workloads. Emphasis is placed on hardware-aware defenses, secure AI accelerator design, and hardware–software co-design approaches to resilient system development. Emerging challenges and future research directions in securing next-generation AI hardware platforms are also discussed.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 334, AI 350
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Computer Organization, Embedded Systems, Machine Learning, Basic Digital Logic, and Programming in C / Python

Course materials

Required texts:

- *Hardware Security: Design, Threats, and Safeguards.* Tehranipoor, M., & Wang, C. (2012). Springer.
- *Security and Privacy in Machine Learning.* Shokri, R., & Shmatikov, V. (Eds.). (2023). Cambridge University Press.

Other Course Materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work. This will include lecture slides and lab manuals as they will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	Weight
Midterm Exam	25%
Final Exam	50%
Assignments	10%
Design Project	15%
Total	

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Cybersecurity and AI	Overview of AI system architectures and the unique cybersecurity challenges introduced by AI-driven and AI-enabled platforms.
2	Hardware Foundations for AI Systems	Fundamentals of digital hardware, processors, memory hierarchies, and AI accelerators that underpin modern machine learning systems.
3	Hardware Security Primitives	Core hardware-based security mechanisms such as secure boot, roots of trust, cryptographic modules, and physical unclonable functions (PUFs).
4	Threat Models and Attack Surfaces	Systematic analysis of attacker capabilities, threat modeling methodologies, and identification of hardware-level attack surfaces in AI systems.
5	Hardware Trojans & Supply Chain Risks	Design-time and fabrication-time hardware Trojan threats, detection techniques, and vulnerabilities across the semiconductor supply chain.
6	Side-Channel Attacks on AI Hardware	Various side-channel attacks targeting AI inference and training hardware.
7	Fault Injection Attacks	Various fault injection techniques and their impact on AI model integrity and system reliability.
8	Trust for AI Devices	Trusted computing concepts, device attestation, and establishing verifiable trust in edge and embedded AI platforms.
9	Memory Security and Data Protection	Secure memory architectures, encryption, access control, and protection of model parameters and sensitive datasets.
10	Trusted Execution for AI Workloads	Trusted execution environments (TEEs), confidential computing, and secure isolation of AI training and inference workloads.
11	GPU, TPU & AI Accelerator Security	Security vulnerabilities and protections specific to GPUs, TPUs, and domain-specific AI accelerators.
12	Defense, Co-Design & Future Topics	Hardware–software co-design strategies, hardware-aware AI defenses, and emerging research challenges in secure AI infrastructure.

Engineering Tools
Throughout the course project and assignments, students will gain experience using various free/open-source software vulnerability (static and dynamic) analysis tools.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master concepts.

Course Learning Outcomes (CLOs)
CLO 1 Explain the architecture of AI systems and identify hardware-level security risks across the AI–hardware stack.
CLO 2: Analyze hardware-based attacks on AI systems, including side-channel, fault-injection, and supply chain threats.
CLO 3: Develop basic threat models for AI platforms operating in edge, embedded, and cloud environments.
CLO 4: Evaluate hardware trust mechanisms such as secure boot, hardware roots of trust, and trusted execution environments for AI workloads.
CLO 5: Assess security vulnerabilities in GPUs, TPUs, and AI accelerators, particularly in shared and multitenant settings.
CLO 6: Propose hardware-aware and hardware–software co-designed defenses to improve the security and trustworthiness of AI systems.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 421 Cloud Vector Database Systems for AI (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
Vector databases (VDBs) have become a foundational component of modern AI systems, driven by the widespread use of large language models. Unlike traditional databases, VDBs are designed for high-dimensional similarity search and approximate query processing, prioritizing retrieval efficiency over strict transactional guarantees. This course presents a system-level and practical study of vector databases, covering embedding models and vector representations, similarity metrics, exact and approximate nearest neighbor search (ANNS), and vector query processing. Core indexing and retrieval techniques include inverted file indexing (IVF), graph-based ANN search (HNSW), product quantization (PQ), and hybrid approaches such as IVF-PQ and HNSW-PQ. The course also examines cloud and distributed V-DBMS architectures and the integration of VDBs with LLMs through Retrieval-Augmented Generation (RAG). A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 352
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Data Structures and Algorithms: Proficiency in algorithmic complexity analysis (Big-O notation), and familiarity with trees, graphs, and basic clustering or search concepts.
- Programming Experience: Working knowledge of C++ and/or Python, including understanding of memory management, file I/O, and object-oriented programming principles.
- Basic Mathematical and Analytical Skills: Comfort with linear algebra concepts (e.g., vectors and distances) and general analytical reasoning. Prior exposure to introductory machine learning concepts (e.g., K-means, k-NN, and PCA) is recommended but not required.

Course materials
Required Textbook: *Vector Databases: A Practical Introduction, 1st ed.*. Nitin Borwankar. O'Reilly Media

Grading Scheme

Assessment tool	Weight (UG)	Weight (G)
Individual Assignments	30%	30%
Project	N/A	30%
Midterm Exam	30%	N/A
Final Exam	40%	40%
Total	100%	100%

Graduate students complete a forward-looking course project in place of the midterm examination. This substitution reflects the advanced expectations at the graduate level, emphasizing system design, implementation, experimental evaluation, and deeper analytical reasoning.

Tentative Course Schedule

Week 1: Introduction, LLM Embeddings, and Vector Representations

- **Topics:** Week 1 introduces the motivation for vector databases and their role in modern AI systems. Topics include dense and sparse vector embeddings, embedding generation pipelines for text and documents, and common embedding models used with LLMs. Students study vector dimensionality, similarity and distance metrics (cosine similarity, Euclidean distance, inner product), and the implications of high-dimensional spaces, including the curse of dimensionality

Week 2: DBMS vs. V-DBMS: Transaction vs. Vector Retrieval

- **Topics:** Week 2 contrasts traditional relational and NoSQL DBMS designs with vector database workloads. Topics include SQL and NoSQL data models, ACID properties and MVCC, and why strict transactional semantics are often relaxed in vector retrieval systems. The week introduces hybrid query processing that combines metadata filtering with vector similarity search, highlighting design tradeoffs in “vector search + SQL” systems.
- Additional Readings: Pinecone VDB

Week 3: Cloud Vector Database Architecture

- **Topics:** Week 3 focuses on the architecture of cloud-based vector database systems. Topics include ingestion pipelines, index construction, storage layouts (in-memory, SSD, and hybrid designs), separation of control and data planes, metadata management, replication strategies, and failure handling. Students analyze architectural bottlenecks and scalability considerations in large-scale deployments.
- Additional Readings: VDB Tutorial (SIGMOD-Companion’24)

Week 4: Vector Query Processing and Exact Nearest Neighbor (ENN) Search

- **Topics:** Week 4 examines vector query execution pipelines and exact nearest neighbor (ENN) search as a baseline. Topics include brute-force similarity search, computational complexity analysis, memory bandwidth considerations, and the use of FAISS flat indexes. Students evaluate performance limitations of exact search at scale.

Week 5: Efficient Indexing I: Approximate Nearest Neighbor Search (ANNS) with IVF

- **Topics:** Week 6 introduces approximate nearest neighbor search using inverted file indexes (IVF). Topics include coarse quantization via clustering, assignment of vectors to partitions, query probing strategies, and tuning parameters such as the number of clusters and probes. Tradeoffs between recall, latency, and index build cost are analyzed.

Week 6: Midterm/Project Proposal

- **Topics:**
  - Undergraduate students take a midterm exam.
  - Graduate students submit their project proposals outlining a vector database related problem, system design goals, datasets, baseline methods, and evaluation metrics. Emphasis is placed on scoping, system-level contributions, and experimental methodology. Feedback is provided to refine project direction and feasibility.

Week 7: Efficient Indexing II: Graph-Based ANN and HNSW

- **Topics:** Week 7 covers graph-based ANN algorithms with a focus on Hierarchical Navigable Small World (HNSW) graphs. Topics include multi-layer graph construction, neighbor selection heuristics, greedy and beam search strategies, and parameter tuning. Comparisons between graph-based and partition-based indexing methods are discussed.

Week 8: Efficient Indexing III: Product Quantization and IVF-PQ

- **Topics:** Week 8 focuses on vector compression techniques for memory- and storage-efficient retrieval. Topics include product quantization, subspace decomposition, codebook construction, approximate distance computation, and hybrid IVF-PQ indexing. Students study accuracy–compression tradeoffs and performance at large scale.

Week 9: Retrieval-Augmented Generation with Vector Databases

- **Topics:** Week 9 explores the integration of vector databases with LLMs through Retrieval-Augmented Generation (RAG). Topics include RAG system architecture, document chunking strategies, hybrid retrieval, query rewriting, index freshness, and common failure modes such as retrieval mismatch and hallucination. End-to-end system performance considerations are emphasized.

Week 10: Cloud V-DBMS: Load Balancing and Scalability

- **Topics:** Week 10 examines scalability challenges in cloud vector databases. Topics include data and index sharding, query routing, replication for throughput, handling skewed workloads, and tail latency optimization. Students analyze how load balancing strategies impact retrieval performance and system reliability.

Week 11: Distributed Vector Databases and Emerging Trends

- **Topics:** This week studies distributed vector database designs and open research challenges. Topics include distributed ANN search, global versus local recall,

consistency–performance tradeoffs, multi-tenant systems, and emerging trends such as hybrid symbolic–vector databases, learned indexes, and vector support within traditional DBMSs.

- **Additional Readings:**
  - Harmony (SIGMOD'25)
  - Milvus (SIGMOD'21)

Week 12: Final Project Presentation

- **Topics:** Students present final projects demonstrating the design, implementation, and evaluation of a vector database system or application. Presentations emphasize system architecture, indexing choices, experimental results, and lessons learned from building scalable vector retrieval systems.

Assignments:

A1: Vector Embeddings and Exact Nearest Neighbor Search
A1 examines vector embeddings, similarity metrics, and exact nearest neighbor (ENN) search. Students analyze distance computations, high-dimensional effects, and the time and space complexity of brute-force vector search. Emphasis is placed on theoretical understanding and performance analysis.

A2: Approximate Nearest Neighbor Search and Indexing Techniques
A2 focuses on approximate nearest neighbor search (ANNS) algorithms, including IVF, HNSW, and product quantization (PQ). Students compare indexing structures, analyze algorithmic design choices, and reason about accuracy–latency–memory tradeoffs. Questions emphasize conceptual understanding and comparative analysis.

A3: Cloud Vector Databases and LLM-Based Systems
This assignment explores the integration of vector databases with LLM-based applications and cloud environments. Students analyze system architectures for cloud and distributed V-DBMS, including query processing, load balancing, and scalability challenges. Conceptual questions address Retrieval-Augmented Generation (RAG) and end-to-end system design considerations.

Projects:

The course project focuses on designing and implementing a vector database management system (V-DBMS) for large-scale similarity search. The project emphasizes system design, indexing algorithms, query processing, and scalability. Students may work individually or in teams of up to two.

M1: Query Interface and Single-Server V-DBMS. Students build a multi-client, single-server vector database manager that supports vector ingestion and similarity search through a defined query interface (e.g., REST or RPC). The system should support basic query execution and configurable similarity metrics.

M2: Vector Indexing Engines. Students implement and integrate at least two vector indexing methods chosen from IVF, IVF-PQ, HNSW, HNSW-PQ, ANNOY, or LSH. Indexes must be evaluated and compared in terms of recall, latency, and memory usage, highlighting tradeoffs between different ANN techniques.

M3: Cloud-Native and Distributed V-DBMS. Students extend their system to a distributed setting by supporting data or index partitioning, query routing, and basic load balancing across multiple nodes. The focus is on scalable architecture rather than full production-grade fault tolerance.

M4: Advanced Features and Extensions. Students add one or more advanced features that demonstrate creativity and deeper understanding, such as Retrieval-Augmented Generation (RAG), integration with LLMs, hybrid vector–SQL queries, or performance optimizations.

The project is evaluated based on system design, correctness, performance analysis, and clarity of documentation.

Engineering Tools
Students will be introduced to and utilize industry-standard and research-grade tools throughout the course, including:

- Vector Databases and Extensions: Systems such as Pinecone, Qdrant, Chroma, and vector extensions of traditional databases (e.g., PostgreSQL with pgvector).
- Indexing and Similarity Search Libraries: Libraries such as FAISS (Meta), Annoy, and HNSWlib for exact and approximate nearest neighbor search.
- Retrieval-Augmented Generation (RAG) Frameworks and Local LLMs: Frameworks such as LangChain and LlamaIndex, and lightweight local LLM runtimes including Ollama and LM Studio with models such as Llama 3 (8B), Mistral 7B, or Gemma.

Course Learning Outcomes (CLOs):
1. Understand vector representations, LLM embeddings, similarity metrics, and the challenges of exact and approximate nearest neighbor search in high-dimensional spaces.
2. Design and implement vector indexing and retrieval algorithms, including IVF, HNSW, product quantization (PQ), and hybrid approaches such as IVF-PQ and HNSW-PQ.
3. Analyze performance tradeoffs in vector search systems, including latency, accuracy, memory usage, and scalability.
4. Understand and evaluate cloud-native and distributed vector database architectures, including indexing pipelines, query execution, and load balancing.
5. Build and assess AI applications using vector databases, including Retrieval-Augmented Generation (RAG) and integration with LLM-based systems.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 424 Optimization for Machine Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
The constrained optimization problem for machine learning; Pareto optimality; KKT conditions for optimality; gradient descent, Newton's, and interior point algorithms; Lagrange duality; data statistics and pre-processing; applications to predictive analytics using time-series models, regression, and classification using neural networks, and support vector machines; applications to k-means clustering using Lloyd's algorithm. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 300
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

1. Basic knowledge of calculus, linear algebra, probability, and mathematical analysis
2. Working knowledge of MATLAB/SIMULINK or Python (for the project)

Grading Scheme

Assessment tool	Weight
2 midterm exams	33% + 33%% = 66%
Homework	9%
Project	25%
Total	100%

Tentative Course Schedule

Part I: Constrained Optimization

- Constrained optimization and Pareto optimality
- Karush-Kuhn-Tucker (KKT) necessary conditions of optimality
- Sufficient conditions of optimality
- Lagrange Duality

Part II: Numerical Algoritms

- Gradient descent method
- Newton's method
- Interior point algorithms

Part III: Applications to Machine Learning and AI

- Predictive analytics using time-series models

- Regression using neural networks
- Classification using neural networks and support vector machines
- k-means clustering using Lloyd's algorithm

Project Details
The project component of this course provides hands-on experience in designing a machine learning system for one of the applications discussed in class using data from a publicly available database.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **Python (PyTorch) or Matlab:** utilized for designing Deep Neural Network (DNN) models and extracting characteristics (e.g., weights and activations).
- **Matlab+cvx or Python+cvx:** used to solve optimization problems

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts:

1. formulate mathematically an AI-based optimization problem given a problem statement
2. classify AI-based optimization problems into convex and nonconvex programs
3. solve AI-based optimization problems subject to equality and inequality constraints
4. use steepest descent, Newton and interior point methods to find locally-optimal solutions
5. acquire working knowledge of neural networks, support vector machines and Lloyd's algorithm to solve predictive analytics, regression, classification, and clustering problems

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 425 Resilient AI in Safety-Critical Applications (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course provides an in-depth study of principles and technologies for designing and operating resilient Artificial Intelligence (AI) systems in safety-critical applications. Students examine the reliability, robustness, and security challenges posed by AI components integrated into domains such as industrial control, autonomous driving, smart grids, robotics, and other critical systems and services. The course focuses on resilience by design and resilience in operation against unintentional faults, misconfigurations, model drifts, data loss, hardware errors, network failures, and system-level disruptions. Topics include resilience engineering principles, AI failure modes, resilience metrics, architectural redundancy, fault injection and evaluation, reliability-aware model development, runtime monitoring, anomaly detection, adaptive mitigation, AI resilience in real-time and embedded systems, verification and validation, and safety standards and certifications for AI-integrated components and systems. Case studies from industrial safety-critical domains and recent research literature are integrated. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 380
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine Learning Fundamentals: Understanding of supervised and unsupervised learning, neural networks, model training and evaluation, overfitting, generalization, and basic optimization techniques.
- Probability and Statistics: Knowledge of random variables, probability distributions, and hypothesis testing.
- Programming Skills: Proficiency in Python and experience with at least one ML framework (e.g., PyTorch), and familiarity with simulation or data analysis tools.
- Computer Systems & Embedded Systems: Understanding of OS fundamentals, real-time constraints, embedded platforms, and system-level integration.
- Basic Cyber-Physical Systems Concepts (recommended): Understanding of sensing, actuation, communication, feedback control, stability concepts, and system-level interactions in engineering systems

Course materials
Recommended Textbooks

- Hollnagel, E., Woods, D. D., & Leveson, N. (Eds.). (2006). Resilience engineering: Concepts and precepts. Ashgate Publishing, Ltd.
- Nemeth, C. P., & Hollnagel, E. (2016). Resilience engineering in practice, Volume 2: Becoming resilient. CRC Press

Other materials

- Research Papers: A curated list of seminal papers to be posted on the course website.
- Software Tools: PyTorch.
- Lecture Slides: Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	40%
Design Project	40%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Resilient AI in Safety-Critical Systems	Overview of safety-critical domains (autonomous systems, smart grids, healthcare, industrial control); AI in cyber-physical systems (CPS); resilience vs. reliability vs. robustness; failure modes of AI-enabled systems.
2	Foundations of Resilience Engineering	Principles of resilience engineering; fault, error, failure taxonomy; redundancy and diversity; graceful degradation; resilience metrics (availability, MTBF, MTTR).
3	Failure Modes in AI-Enabled Systems	Data distribution shift; sensor/actuator faults; hardware errors; model drift; cascading failures; real-world case studies of AI system incidents.
4	Resilience by Design: Architectures and Redundancy	Architectural redundancy (spatial/temporal); ensemble methods for reliability; watchdog architectures; fail-operational vs. fail-safe design; diversity in models and sensing.
5	Fault Injection and Reliability Evaluation	Fault modelling (bit flips, sensor dropouts, timing faults); fault injection frameworks; stress testing; resilience benchmarking methodologies.
6	Reliability-Aware AI Model Development	Robust training under noisy data; uncertainty-aware models; calibration; out-of-distribution detection (non-adversarial); confidence estimation for safe decisions.
7	Runtime Monitoring and Anomaly Detection	Online performance monitoring; health monitoring of AI models; runtime verification; anomaly detection in system states; detection of abnormal operational behavior.
8	Adaptive and Self-Healing AI Systems	Dynamic reconfiguration; model switching; fallback control strategies; adaptive thresholding; recovery and re-learning strategies during operation.
9	AI in Real-Time and Embedded Systems	Timing constraints; real-time scheduling; edge AI deployment; resource constraints; hardware–software co-design for dependable inference.

10	Verification & Validation of AI-Infused Systems	Testing strategies for AI systems; coverage metrics; scenario-based validation; simulation environments; safety cases for AI components.
11	Safety Standards and Certification	Overview of standards (e.g., ISO 26262, IEC 61508); assurance arguments; traceability; hazard analysis (FMEA, FTA); regulatory considerations for AI-enabled systems.
12	Integrated Case Studies and Emerging Directions	Case studies in autonomous driving, smart grids, medical AI, or other applications; resilience trade-offs; system-level integration challenges; emerging research trends in resilient AI.

Project Details
The project component of this course provides hands-on experience in designing, implementing, and evaluating resilient AI systems for safety-critical applications. Students will develop and experimentally assess resilience mechanisms under realistic fault and operational scenarios using simulation and/or embedded platforms.

Project expectations:
- **Safety-Critical Use Case Definition:**
  Select a representative application (e.g., autonomous perception module, smart grid load forecasting, medical signal classification, industrial anomaly detection). Define operational requirements, safety constraints, and potential failure modes.
- **Baseline AI System Development:**
  Implement and train a machine learning or deep learning model (e.g., a CNN, RNN, or transformer-based model) in Python (e.g., PyTorch). Establish baseline performance metrics (accuracy, latency, resource usage).
- **Fault Modelling and Injection:**
  Design and implement fault models, such as sensor noise, missing data, distribution shifts, communication delays, or hardware-level perturbations (e.g., bit flips in weights/activations). Conduct systematic fault injection and quantify system-level impact.
- **Resilience-by-Design Mechanisms:**
  Incorporate architectural or algorithmic resilience strategies, such as redundancy (e.g., ensemble models, multi-sensor fusion), uncertainty estimation, confidence-based rejection, fallback logic, or graceful degradation. Compare with baseline behaviour.
- **Runtime Monitoring and Adaptive Response:**
  Develop runtime monitoring mechanisms (e.g., performance drift detection, anomaly detection on inputs/outputs, and health metric tracking) and implement adaptive mitigation strategies, such as model switching, threshold adaptation, or safe-fallback control.
- **Resilience Evaluation and Reporting:**
  Define resilience metrics (e.g., performance under fault, recovery time, degradation slope, availability). Perform quantitative analysis and discuss trade-offs among resilience, accuracy, latency, and computational cost.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:
- **PyTorch:** Used for developing and training AI models, implementing uncertainty-aware inference, and evaluating model performance under fault and distribution-shift conditions.

- **Python Scientific Stack (NumPy, SciPy, Pandas, Matplotlib):** For data preprocessing, statistical analysis, fault modeling, and visualization of resilience metrics (performance degradation, recovery time, confidence calibration).
- **Fault Injection Frameworks (e.g., PyTorchFI or custom fault injection tools): Used to simulate model-level and hardware-inspired faults such as bit flips, weight perturbations, sensor noise, or missing data, enabling controlled resilience evaluation.**
- **Simulation Environments (e.g., CARLA, Grid simulators, or CPS simulation platforms):** For modelling safety-critical operational scenarios such as autonomous driving, smart grids, or industrial processes, and evaluating the system-level impact of AI failures.
- **Runtime Monitoring & Logging Tools:** Implementation of health monitoring modules, anomaly detection pipelines, and performance drift detection using Python-based monitoring frameworks.
- **Docker or Virtual Environments:** For reproducible deployment, controlled experimentation, and testing of resilience mechanisms under consistent system configurations.
- **Testing & Verification Tools:** Unit testing frameworks (e.g., pytest), scenario-based simulation testing, and coverage analysis tools for validation of learning-enabled components.
- **Embedded/Edge Platforms (optional, depending on offering):** NVIDIA Jetson, Raspberry Pi, or similar platforms for evaluating real-time performance, resource constraints, and operational resilience in edge AI deployments.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Identify and analyze failure modes and operational risks in AI-enabled safety-critical systems, and quantify resilience metrics such as availability, degradation, and recovery time.
CLO 2: Design AI models and system architectures with resilience-by-design techniques, including redundancy, reliability-aware modelling, and fault-tolerant mechanisms.
CLO 3: Implement and evaluate resilience-in-operation strategies, such as runtime monitoring, anomaly detection, adaptive mitigation, and graceful degradation under realistic fault or operational scenarios.
CLO 4: Apply engineering and simulation tools (Python, PyTorch, fault injection frameworks, simulators) to experimentally assess and improve the robustness and reliability of AI systems.
CLO 5: Communicate engineering solutions effectively through structured technical documentation, reporting resilience analysis, experimental results, and system-level design trade-offs.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 431 Cloud AI and Distributed Machine Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the foundations and practice of cloud-based artificial intelligence and distributed machine learning. Students learn how modern AI workloads are trained, deployed, and managed across cloud and distributed computing platforms. Topics include cloud computing fundamentals, virtualization and containers, distributed data processing, parallel and distributed model training, model serving, orchestration, scalability, reliability, and security/privacy issues in cloud AI systems. The course includes hands-on work with contemporary cloud and ML tools.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 333 and AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Data Structures and Algorithms
- Probability/Statistics for Engineering or Computer Science
- Introductory Machine Learning or Artificial Intelligence
- Operating Systems or Computer Networks.

Course materials
Required Textbook: *Cloud Computing for Machine Learning and Cognitive Applications,* Kai Hwang (MIT Press), 1st Edition, 2017

In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- *Handson: Distributed Machine Learning Patterns* by Yuan Tang, Manning, 2023
- **Lecture Slides and Lab Manuals:** Will be posted weekly on the course website (Moodle)

Grading Scheme

Assessment tool	Weight
Assignments/Labs	30%
Midterm Exam	25%
Final Exam	25%
Course Project	20%
Total	

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Cloud AI and Distributed ML	What cloud AI is, why distributed ML matters, major application domains, overview of the course project
2	Cloud Computing Foundations	Cloud service models, public/private/hybrid cloud, compute, storage, networking, elasticity and multitenancy
3	Virtualization, Containers, and Microservices	VMs vs. containers, Docker basics, containerized ML environments, reproducibility
4	Distributed Storage and Data Processing	Distributed file systems, object storage, data pipelines, batch vs. stream processing, data locality
5	ML Workloads on Cloud Infrastructure	/GPU/TPU resources, scheduling, performance bottlenecks, training pipelines.
6	Parallel and Distributed Training	Data parallelism, model parallelism, synchronous vs. asynchronous training, communication overhead
7	Distributed ML Frameworks	Introduction to tools such as PyTorch Distributed, TensorFlow distributed strategies, Ray, Spark ML, or similar.
8	Model Deployment and Serving	Inference pipelines, REST/gRPC services, model packaging, latency vs throughput, autoscaling
9	Orchestration and MLOps Basics	Kubernetes basics, workflow automation, CI/CD for ML, experiment tracking, model versioning
10	Reliability, Monitoring, and Cost Optimization	Fault tolerance, observability, logging, resource utilization, cloud cost awareness
11	Security, Privacy, and Responsible Cloud AI	Access control, data confidentiality, model leakage, adversarial concerns, federated learning basics, ethics.
12	Emerging Topics and Project Presentations	Edge-cloud AI, distributed LLM serving/training overview, green AI, final project demos

Lab Details

The labs will progressively build practical skills:

- Lab 1: Dockerizing a simple ML application
- Lab 2: Running training jobs on cloud VMs or containers
- Lab 3: Basic distributed training experiment
- Lab 4: Deploying a model as a scalable service
- Lab 5: Monitoring and evaluating performance/cost
- Lab 6: Final mini-project milestone.

Possible Course Project Ideas

- Distributed image classification training pipeline
- Cloud-based smart-home anomaly detection system
- Scalable model serving for a chatbot or recommender
- Federated learning prototype for privacy-preserving analytics
- Cost-performance comparison of ML training across deployment choices
- End-to-end MLOps pipeline for a small AI application

Engineering Tools

Depending on available infrastructure, the course could use:

- Python
- PyTorch or TensorFlow
- Docker
- Kubernetes
- Ray or Spark
- GitHub Actions or similar CI/CD tools
- AWS Educate, Google Cloud credits, Azure for Students, or local servers at Concordia

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO1: Explain the fundamental concepts of cloud computing, including service models, virtualization, containerization, and distributed resource management
CLO2: Describe the architecture and workflow of cloud-based AI systems and distributed machine learning pipelines
CLO3: Apply appropriate tools and frameworks to package, deploy, and manage AI/ML applications in cloud environments
CLO4: Analyze and compare different approaches to parallel and distributed machine learning, including their scalability, communication cost, and performance tradeoffs
CLO5: Design and implement basic end-to-end cloud AI workflows involving data processing, model training, deployment, and inference serving
CLO6: Work effectively in teams to develop and communicate a practical cloud AI or distributed ML solution through reports, demonstrations, and presentations

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 432 Robot Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the principles and methodologies that enable robots to learn from interaction, data, and demonstrations. Topics include Markov Decision Processes, imitation learning, reinforcement learning, actor–critic and policy gradient methods, optimal control, deep model-based RL, inverse reinforcement learning, intrinsic motivation, robot simulation and sim-to-real transfer, and emerging vision- and language-based robot learning techniques. The course also integrates visual learning approaches for robot decision-making, including generative models and representation learning, reflecting the growing role of multimodal foundations in robotics. A term project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 300, AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine Learning Fundamentals: Supervised learning, optimization, neural networks.
- Probability & Stochastic Processes: Understanding of Markov chains, expectations, distributions.
- Programming Requirements: Python (PyTorch preferred), ability to work with simulation libraries (e.g. Isaac Sim).
- Control & Robotics Basics: Kinematics, dynamics, control fundamentals (helpful but not required)

Course materials
Recommended Textbooks:
- Sutton, R. S., & Barto, A. G. (1998). *Reinforcement learning: An introduction* (Vol. 1, No. 1, pp. 9-11). Cambridge: MIT press.
- Lapan, M. (2024). *Deep reinforcement learning hands-on*. Packt Publishing Ltd.
- Lynch, K. M., & Park, F. C. (2017). *Modern robotics*. Cambridge University Press. (for control background)

Other Course Materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- **Research Papers:** Key papers on imitation learning, deep RL, model-based RL, sim2real, visual learning for robotics, and foundation-model-based robotics.
- **Software Tools:**
  - PyTorch: for DNNs and RL algorithms.

- Robomimic, RLlib, stable-baselines3, or equivalent libraries

Lecture Slides and Lab Manuals: Will be posted weekly on Moodle.

Grading Scheme

Assessment tool	Weight
Midterm Exam	25%
Final Exam	40%
Design Project	35%
Total	100%

Tentative Course Schedule

Week 1. Intro to robot learning
Week 2. Markov Decision Process basics and imitation learning
Week 3. Reinforcement Learning basics for robot control
Week 4. Policy gradient methods, actor critic methods
Week 5. Optimal control and planning
Week 6. Deep model based RL
Week 7. Inverse RL
Week 8. Curiosity driven exploration
Week 9. Robot simulation and sim2 real
Week 10. Safe RL and safe robot learning
Week 11. Foundation models in robotics
Week 12. Case studies/hands on robot learning in simulation

Project Details
The final project is a practical investigation into a topic in robot learning. Students may work individually or in pairs and will propose, implement, evaluate, and present an end-to-end learning system.

Project expectations:

- Robot Learning Algorithm Implementation: Implement or extend an RL, imitation learning, or model-based method.
- Simulation-Based Experimentation: Use Mujoco, dm_control, Isaac Gym, or similar environments; evaluate performance under multiple condidtions
- Sim2Real Component (Optional/Bonus): Deploy on a real robot or include robustness analysis.
- Technical Report & Presentation: Document experiments, results, and engineering methodology.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- PyTorch: Neural network and RL algorithm development.

- Simulation Environments: Mujoco, PyBullet, Isaac Gym, Gymnasium, dm_control.
- RL Libraries: stable-baselines3, RLlib, Robomimic, or custom implementations.
- Visualization Tools: TensorBoard, Matplotlib, and robot trajectory tools

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Formulate robot learning problems using MDPs and apply imitation learning and RL methods
CLO 2: Evaluate and compare robot learning algorithms for stability, safety, and sample efficiency
CLO 3: Implement modern RL algorithms (e.g., PPO, SAC, TD3) for continuous robotic control
CLO 4: Apply model-based RL and sim-to-real strategies to improve robot generalization
CLO 5: Design, implement, and document a complete robot learning system through a final project

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 434 Distributed Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course explores practical distributed learning algorithms used in training deep learning models at large scale as well as state-of-the-art methods in the literature along with privacy preserving federated learning variants. It focuses on advanced techniques in communication efficient distributed data parallelism, including communication compression, local SGD, gossip algorithms, asynchronous updates, and overlapping communication with computation. The course also delves into model parallelism and related approaches for large models such as pipelining, tensor parallelism, as well as sharding. These methods are also studied in the context of privacy-preserving federated learning, with additional focus on the unique challenges posed by client heterogeneity, personalization, and data privacy attacks (differential privacy and secure aggregation). Students engage critically with current research through regular readings and presentations of recent papers. A final project is also required.

Components: Lecture 3 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Grading Scheme

Assessment tool	Weight
Assignments	15%
Exams	35%
Project	30%
Presentations	20%
Total	100%

Tentative Course Schedule

Week 1 : Introduction: Gradient Descent, Distributed Data Parallelism
Week 2 : Communication-Efficient Data Parallelism: Gossip, Local SGD, Communication Compression
Week 3: Federated Learning: Client Drift, Heterogeneity, Privacy, Personalization
Week 4 : Theoretical Analysis of Distributed Optimization
Week 5 : Model Parallelism 1: Pipelining, Tensor Parallelism, Context Parallelism
Week 6 : Model Parallelism 2: Sharded Parallelism, Implementations
Week 7 : Asynchrony and Communication Overlap
Week 8 : Recent Advances Federated Learning
Week 9 : Recent Advances Decentralized Learning
Week 10 : Recent Advances in Model Parallelism
Week 11 : Recent Advances in Asynchronous Methods
Week 12 : Final Project Presentation

Course Learning Outcomes (CLOs):
TBD.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 436 Deep Learning for Computational Pathology (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces deep learning in computational pathology, covering theory and practical experience. It includes diagnostic pathology and clinical applications, detailed exploration of digital pathology with high-resolution Whole Slide Image (WSI) acquisition, revisiting foundational deep learning principles, data gathering with domain expertise, preprocessing of WSIs, representation learning models from examining robustly supervised to minimally supervised tasks. Special topics in computational pathology will be emphasized on inductive bias, OOD, privacy-preserving learning, and foundational modeling. The course also delves into Computer-Aided Diagnosis (CAD) system development for clinical deployment and related challenges. Labs provide hands-on experience where students gain insights applicable to computational modeling of digital pathology images. Project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.
1. Sufficient knowledge from machine learning and deep learning topics
2. Data structure and algorithms
3. Python programming including libraries from Sklearn, Matplotlib, Numpy, Pillow, PyTorch
4. Calculus/Linear algebra topics from mathematics and Basic image processing concepts

Course materials
There is no specific textbook for this course. There will be series of papers, course slides, reports, GitHub repositories which will be assigned during the lecture for reading and preparation.

Grading Scheme

Assessment tool	**Weight**
Lab Assignment: three (3) lab assignments (programming exercises and reporting)	15%
Seminar Presentation: two (2) presentations with report submissions on selected papers	20%
Course Project (individually or in group of two): two progress report submissions	40%
Final Exam: project report submission and presentation by exam date	20%
In-class participation: engage in class discussions	5%
Total	100%

Grades will be based on five different modules. Each student will be assigned with Three(3) papers for critical review and reporting as the first assignment task. Student will write three-pages of review and criticise the papers in detail. According to the paper critiques, student will give a presentation to the class. Class discussion will be taken to account during presentation and will be accrued towards their participation mark. In addition, there are four lab assignments that will be reviewed during lab sessions and a submission is required for each lab. The course has a major project either done individually or in group. For groups more than two people, students require instructor's consent and the project is required to be more substantial. Students are required to submit a project proposal, two progress reports, a final report, and do a project presentation as their exam. Project presentations will be conducted on last session 12 and final exam session.

Tentative Course Schedule

Week	Lecture topic
1	Introduction to digital pathology: microscopy resolution, Whole Slide Imaging (WSI), preprocessing
2	Introduction to deep learning and computer vision: data processing, image encoders, optimization
3	Pathology medicine and clinical applications
4	Laboratory workflow in clinical pathology (site visit)
5	Computational Pathology-I: application design, data supervision, normalization, deep training process
6	Computational Pathology-II: patch- to slide- level encoding, self-supervision, foundation modeling
7	Special Topics in Computational Pathology: domain generalization, vision-language modeling
8	Seminar presentation-I: students presentations from paper collection(s) followed by report submissions
9	Seminar presentation-II: students presentations from paper collection(s) followed by report submissions
10	Seminar presentation-III: students presentations from paper collection(s) followed by report submissions
11	Seminar presentation-IV: students presentations from paper collection(s) followed by report submissions
12	Seminar presentation-V: students presentations from paper collection(s) followed by report submissions

Lab Details

The following lists the lab training and experiments.

- Introduction to digital Whole Slide Images (WSI) and viewing systems
- Introduction to Tissue Image Analysis (TIA) Toolbox
    - WSI reading and writing
    - WSI pixel-level pre-processing and filtering
    - WSI patch extraction
    - WSI tissue semantic segmentation
    - WSI registration
- Patch image classification

- Class object (e.g. nuclei) detection and segmentation
- Deep feature extraction from pretrained neural network models e.g. CNNs, ViTs
- Visualization techniques
- Classifier designs with self-supervised learning and downstream tasking

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following science engineering concepts:

Course Learning Outcomes (CLOs)
• familiarization with full concept of clinical pathology in relation to engineering science for developing meaningful diagnostic CAD tools for clinical practice and integration
• fully understand the digital pathology pipeline for whole slide tissue imaging, being able to view and process slide images for post-processing preparation in deep learning
• learning the necessary deep learning tools for developing useful tasks in computational pathology and understanding different deep learning models for representation learning tasks in whole slide imaging
• familiarization with different toolboxes for processing WSI data and related project development.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 441 MLOps: Machine Learning Operations (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
Machine Learning Operations (MLOps) focuses on the deployment, monitoring, and management of machine learning models in production environments. This course covers end-to-end model lifecycle operations, including Continuous Integration/Continuous Deployment (CI/CD) pipelines, versioning, model governance, and infrastructure automation using orchestration frameworks such as Docker and Kubernetes. Students learn how to design reproducible machine learning workflows, implement automated training and deployment pipelines, manage data and model versioning, and monitor model performance, drift, and reliability in real-world systems. The course emphasizes scalable architectures, testing strategies for ML systems and ethical model governance. Through a hands-on project, students build and deploy production-ready machine learning services, gaining practical experience with experiment tracking, containerization, API deployment, cloud-based infrastructure, and performance monitoring. By the end of the course, students are able to operationalize machine learning models efficiently, ensuring robustness, scalability, and maintainability in dynamic production environments.

Components: Lecture 3 hours per week

Prerequisites: AI 370
Co-requisites: N/A

Course materials
Required Textbook: *Designing Machine Learning Systems: An Iterative Process for Production-Ready Applications*. Huyen, C. O'Reilly Media, 2022

Other references:

- *Machine Learning Production Systems: Engineering Machine Learning Models and Pipelines* by Robert Crowe, Hannes Hapke, et al., 2024
- *Machine Learning System Design*: With end-to-end example by Valerii Babushkin and Arseny Kravchenko, 2025

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	45%
Project	35%
Total	100%

Tentative Course Schedule

Week	Topic
1	Introduction to MLOps and production machine learning systems
2	Reproducible machine learning workflows and experiment management
3	Data and model versioning for collaborative development
4	Design and implementation of end-to-end ML pipelines
5	Containerization and environment management for ML deployment
6	Serving machine learning models via APIs and microservices
7	Continuous integration and continuous deployment for machine learning systems
8	Orchestration and scaling with Kubernetes for ML workloads
9	Monitoring, observability, and performance management of ML Systems
10	Monitoring, observability, and performance management of ML Systems (cont.)
11	Advanced strategies for scaling ML systems in cloud and distributed environments
12	Governance and responsible AI in production systems

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Design and manage reproducible end-to-end ML pipelines
CLO 2: Deploy and scale ML models using containers and orchestration tools
CLO 3: Monitor and optimize ML model performance in production.
CLO 4: Implement CI/CD and automated workflows for reliable ML systems.
CLO 5: Apply governance, security, and ethical standards in MLOps.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
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AI 442 Explainable AI Engineering Process and Validation (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course provides an in-depth study of Explainable Artificial Intelligence (XAI) as a system-level engineering discipline within AI-intensive software systems. Students examine how explainability capabilities are designed, integrated, tested, validated, deployed, and monitored across the AI system lifecycle. The course emphasizes engineering processes, system invariants, testing frameworks, quantitative validation methodologies, performance profiling, computing cost estimation, and sustainability monitoring in cloud-native environments. Topics include explainability-by-design system patterns, architectural and system invariants, reproducibility and traceability engineering, testing strategies for XAI pipelines, quantitative explanation validation (fidelity and stability), performance benchmarking, multi-objective trade-off analysis, and sustainability-aware AI system governance. An engineering project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 330 or AI 332, AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Software Engineering: System decomposition, modular design, API contracts, and software testing fundamentals.
- Machine Learning: Supervised learning, neural network fundamentals, model training and evaluation.
- Programming: Proficiency in Python; experience with ML frameworks preferred.
- Cloud Computing (recommended): Basic understanding of microservices and cloud-native architectures.

Course materials
Required Textbook: *Interpretable Machine Learning,* Christoph Molnar
Online Open Source accessible https://christophm.github.io/interpretable-ml-book/

Other course materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- Research Papers: Selected publications on explainable AI engineering, validation methodologies, system invariants, and sustainable AI systems.
- Software Tools: PyTorch, libraries for attribution analysis, MLflow (experiment tracking), Docker and Github Integration (continuous engineering), free-tier cloud services.
- Lecture Slides and Tutorial Notebooks: Posted weekly on Moodle.

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Three Assignments	30%
Final Exam	30%
Engineering Project	20%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1 Foundation	Foundations of Explainable AI Engineering	Taxonomy of interpretable machine learning; Feature attribution methods; Formal definitions of explanation fidelity and completeness; Role of explainability in high-stakes AI systems.
2 Foundation	AI Lifecycle and Process Integration	AI system lifecycle stages; explainability integration checkpoints; Documentation and governance processes; reproducibility requirements
3 Metrics	Quantitative Explanation Validation	Measuring Explanation Faithfulness; Sensitivity Analysis; Quantitative Benchmarks vs. Qualitative "Plausibility."
4 Design	Explainability-by-Design	System decomposition for XAI integration; Modular explanation services; Interface contracts for prediction and explanation APIs; fService Patterns for Explainable AI systems
5 Verification	System Invariants and Contract-Based Validation for XAI Systems	System Invariants in AI Systems; Specification of Explanation Requirements; Interface Contracts for Explanation Services; Invariant Assertion Checking; Runtime Verification Patterns
6 Verification	Continuous Testing Infrastructure for XAI	Unit, Integration, Regression Testing; GitHub and CI/CD Automation
7 Automation	Scalable Cloud Architectures for XAI	Microservice Orchestration for XAI; Handling "Long-Tail" latency in real-time explanation APIs
8 Systems / Validation	Sustainability Monitoring and Cost Estimation	Energy Consumption Modeling, GPU/CPU Utilization Analysis; Cloud Cost Estimation
9 Operations / Validation	Provenance and Traceability	Experiment Tracking; Data and Explanation Lineage Tracking
10 Operations / Validation	Robustness and Adversarial XAI	Stability Metrics; Sensitivity Analysis; Variance across Model Retraining; Adversarial attacks on XAI
11 Human / Decision	Human-in-the-Loop Engineering	Interactive Explainability; APIs for "Why" and "What-if" queries; User comprehension validation; Designing feedback loops to improve explanation compliance based on expert audit.
12 Synthesis / Decision	Trade-off and Multi-Object Optimization	Accuracy-Interpretability Trade-offs; Latency-Explanation Depth Trade-offs; Resource-aware Pareto Frontier Construction

Project Details
The project component of this course provides hands-on experience in engineering, validation and operate on Explainable AI.

Project expectations:

The core project objective is to move from "Explainability as an afterthought" to "Explainability as a System Requirement." Students will gain the skillset to

- **Engineer** a decoupled architecture that separates model inference from explanation generation.
- **Implement** rigorous quantitative metrics to mathematically verify explanation fidelity.
- **Enforce** system invariants through interface contracts (e.g., rejecting an AI output if its **Enforce** explanation is unfaithful).

Evaluate the operational trade-offs (latency, cost, and energy) of adding an explainability layer to a cloud native system.

Engineering Tools
Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **Programming and Core ML Frameworks:** Python, PyTorch, Scikit-learn
- **Interpretable Machine Learning and XAI Libraries:** SHAP, LIME, Captum, Alibi
- **Testing and Validation Infrastructure:** pytest, Assertion libraries for invariant enforcement, custom validation scripts for metric computation
- **Experiment Tracking and Reproducibility:** MLflow, Version control (Git), Configuration management (YAML)
- **API and System Integration Tools:** FastAPI, Docker, OpenAPI specification
- **Performance Profiling and Resource Monitoring:** Python profiling tools, PyTorch profilers, Memory usage monitoring tools, Basic cloud resource monitoring dashboards
- **Sustainability and Cost Estimation:** Cloud pricing calculators, GPU/CPU utilization monitoring tools, Energy estimation frameworks

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Design Explainability-Integrated AI Systems. Design AI systems that incorporate explainability as a structured system-level requirement, including modular explanation services, interface contracts, and lifecycle integration points.
CLO 2: Specify and Enforce System Invariants for XAI. Formulate specification requirements and system invariants governing prediction–explanation consistency, reproducibility, and service-level constraints, and implement assertion-based enforcement mechanisms.
CLO 3: Develop Testing and Quantitative Validation Frameworks Construct automated testing pipelines and apply quantitative explanation validation metrics (e.g., fidelity, stability, sensitivity) to evaluate explanation quality under controlled experimental conditions.
CLO 4: Analyze System Performance and Trade-offs. Evaluate the performance, scalability, and resource overhead of explainable AI systems, and conduct multi-objective trade-off analysis among accuracy, explainability, latency, and computational cost.

CLO 5: Assess Sustainability and Operational Cost of XAI Systems. Estimate computational cost and resource utilization of explanation pipelines, and propose sustainability-aware deployment strategies for explainable AI services in cloud-based environments

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 443 Embodied AI (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces the principles and modern practice of Embodied AI, where intelligent agents perceive, reason, and act in physical or simulated environments. Using a simulation-first workflow, the course surveys core task settings (e.g., navigation, manipulation, and interaction) and the benchmarks and metrics used to evaluate embodied systems. Students learn how sensing and geometry (cameras, coordinate frames, proprioception, and basic sensor fusion) support spatial understanding, and how agents build and use representations such as occupancy maps, point clouds, scene graphs, and memory under partial observability. The course then develops learning-based decision-making foundations through reinforcement learning and imitation learning, before moving to current trends, including vision-language grounding, vision language model (VLM)-based planning with tool use, and vision-language-action (VLA) models for instruction-conditioned control. Finally, students study world models for prediction and planning (including video-based prediction and latent dynamics with imagination rollouts) and deployment-oriented topics such as runtime monitoring, reliability, observability, and failure analysis. By the end of the course, students are able to design and evaluate embodied agents, integrate perception and representation with learning and planning, and implement basic VLM/VLA- and world-model-enabled pipelines with robust evaluation and diagnostics.

Components: Lecture 3 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Course materials
Required Textbook: *AI for Robotics: Toward Embodied and General Intelligence in the Physical World*. Imran, Alishba, and Keerthana Gopalakrishnan. Apress, 2025

Other references:

- Sutton, Richard S., and Andrew G. Barto. Reinforcement learning: An introduction. Vol. 1. No. 1. Cambridge: MIT press, 1998.
- Selected papers from Robotics and ML conferences

Grading Scheme

Assessment tool	Weight
Midterm Exam	20%
Final Exam	40%
Project	40%
Total	100%

Tentative Course Schedule

Week	Topic
1	Embodied AI: tasks, benchmarks, and the agent loop. For example, POMDP intuition; short intro to navigation vs manipulation vs interaction; simulation-first workflow; datasets/benchmarks and what they measure
2	Sensors for Embodiment: cameras, camera model, coordinate frames, proprioception, sensor fusion
3	Representation of Space: occupancy maps, point clouds, scene graphs; implicit representations (high-level intuition); object-centric vs scene-centric; short-term vs long-term memory
4	Reinforcement Learning Foundations (for embodied settings)
5	Imitation Learning for Embodied Tasks
6	Vision-language grounding for embodied tasks: grounding language in perception; segmentation/detection as “grounders”; evaluation of grounding
7	VLMs as planners: plan-then-act + tool use. For example, VLM prompting for subgoals; constraint-aware planning (collision, reachability); tool APIs (map, detector, motion primitive library)
8	Vision-Language Action models
9	World Models and Prediction I: predictive learning; video prediction as world model
10	World Models and Prediction II: latent dynamics; imagination rollouts; model predictive control with learned models
11	Monitoring and runtime reliability in Embodied AI systems
12	Observability and failure analysis for Embodied AI

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

Course Learning Outcomes (CLOs)
CLO 1: Formulate and evaluate embodied AI problems.
CLO 2: Build perception- and geometry-aware embodied pipelines.
CLO 3: Develop learning-based embodied decision makers.
CLO 4: Integrate language into embodied intelligence.
CLO 5: Use prediction and reliability methods for deployment.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 449 Machine Learning Theory (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces students to some fundamental concepts and techniques at the mathematical foundations of machine learning (ML). Students learn how to apply simple but reasonable approximations of complex high-dimensional models to obtain deep insights into non-trivial phenomena like neural scaling laws, multiple descent, and model collapse. The course also highlights open research problems.

Components: Lecture 3 hours per week

Prerequisites: AI 334
Co-requisites: N/A

Course materials
Recommended Textbooks:

- *Elements of Statistical Learning,* by Jerom Friedman, Robert Tibshirani, and Trevor Hastie
- *AI by Hand,* by Tom Yeh
- *Learning from First Principles,* by Francis Bach
- *High-Dimensional Statistics: A Non-Asymptotic Viewpoint,* by Martin Wainwright
- *High-dimensional Probability,* by Roman Vershynin

Grading Scheme

Assessment tool	Weight
Assignments	30%
Paper review and presentation	10%
Quizzes	20%
Final exam	20%
Research projects	20%
Total	100%

Tentative Course Schedule

Week 1. Mathematical Preliminaries

- Matrices, eigenvalues, eigenvectors, and the SVD
- Laws of Large Numbers, Central Limit Theorems
- Markov, Chebychev, Hoeffding and Bernstein inequalities
- High-dimensional geometry of random vectors

Week 2. Linear Models

- Ordinary-Least Squares (OLS) regression
- Ridge regression
- Bias-Variance decomposition (formula for test error)

Week 3. Random Matrix Theory for ML

- Motivation

Week 3. Random Matrix Theory for ML
• Motivation
• The Stieltjes transform
• The Marchenko–Pastur Law
• High-dimensional analysis of linear regression (exact formula for limiting test error)

Week 4. High-dimensional classification problems
• Recap of basic concepts in convex analysis (Fenchel-Legendre conjugates, dual norms, etc.)
• CGMT (Convex Gaussian Min-max Theorem)
• Exact analysis of logistic classification in high-dimensions

Week 5. Neural Scaling Laws
• Kaplan laws
• Compute-optimal (Chinchilla) scaling laws
• Provable neural scaling laws for associative memories
• Provable neural scaling laws for high-dimensional regression
• Beating neural scaling laws via data-pruning

Week 6. Model Collapse
• Synthetic data: the good, the bad, and the ugly
• Model collapse in mean estimation
• Model collapse in LLMs: empirical results
• Model collapse in toy language model

Week 7. Free Probability Theory for ML
• Crash course on SymPy
• Linear pencils
• R-transform and fixed-point equations
• Marchenko–Pastur Law (again!)

Week 8. Analysis of Covariate-Shift in High-Dimensions
• Linear setting
• Random features model

Week 9. Model Collapse (continued)
• Model collapse in the regression setting
• Mitigation strategies: pruning, mixing, accumulation, etc.
• Strong model collapse
• Open problems

Week 10. Theory of Adversarial Examples
• The strangeness of high-dimensional geometry
• Spurious features and adversarial examples
• Strong negative results (No Free Lunch theorems)
• Memorization and robustness

Week 11. A Theoretical Glimpse at Transformers
• Introduction to self-attention (SA)
• In-context multi-task regression via SA
• Some theoretical results

Week 12. A Few Open Problems
• Reconciling explainability and privacy
• Pitfalls of alignment in LLMs
• Length-generalization in LLMs
• The mystery of chain-of-thought in LLMs
• Adversarial examples: the case of LLMs

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
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On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 454 Quantum Machine Learning (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
As classical computing approaches its physical limits, a new frontier of computation is emerging. This course provides a formal introduction to the intersection of quantum information theory and machine learning. Students rigorously examine the geometry of quantum states, the complexity of quantum kernels, and the theoretical speedups offered by quantum algorithms. Topics include the quantum circuit model, quantum feature mapping, and quantum optimization. A project is required.

Components: Lecture 3 hours per week

Prerequisites: AI 300, AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics:

- Linear algebra: Proficiency in vector spaces, complex numbers, orthonormality, matrix operations, and especially Eigenvalues/Eigenvectors.
- Probability and Statistics: Understanding of expectation values and probability distributions.
- Classical Machine Learning: Understanding of kernel methods and neural networks.

Course materials
Required textbook: *Quantum Machine Learning: A Hands-on Tutorial for Machine Learning Practitioners and Researchers*; Yuxuan Du, Xinbiao Wang, Naixu Guo, Zhan Yu, Qian Yang, Kaining Zhang, Min-Hsiu Hsieh, Patrick Rebentrost, and Dachen Tao; ArXiv: 2502.01146, 2025

Other course materials: In addition to the required textbook, students will be provided with the following materials to support their learning and laboratory work:

- Research Papers: A curated list of seminal papers including the QSVM paper, VQE paper, and Quantum Enhanced Feature Space paper.
- Software Tools: Qiskit**:** For implementing quantum neural network.
- Lecture Slides and Lab Manuals: Will be posted weekly on the course website (Moodle).

Grading Scheme

Assessment tool	**Weight**
3 Assignments	60% (or 20% each)
Final project	40%
Total	100%

Tentative Course Schedule

Week	Topic	Description and key concepts
1	Introduction to Quantum computing	History of quantum computing; Shor's algorithm, Grover's algorithm, and HHL algorithm.
2	Review of the necessary mathematical background	Review of linear algebra and basic probability theory.
3	Mathematical formalism of quantum information I	Qubit, quantum states, unitary operation, and measurements.
4	Mathematical formalism of quantum information II	Density matrix and Bloch sphere, general measurements, partial trace, and quantum circuits.
5	Quantum linear algebra	Block encoding, basic arithmetic for block encodings, and quantum singular value transformation.
6	Quantum kernel methods I	Classical kernel methods, quantum feature encoding.
7	Quantum kernel methods II	Quantum kernel machines and their designs.
8	Quantum kernel methods III	Theoretical foundation of quantum kernel methods: expressivity and generalization. Code demonstration.
9	Quantum Neural Network I	Classical neural network, and quantum variational circuits.
10	Quantum Neural Network II	Quantum perceptron and Grover's algorithm. Discriminative learning with QNN and Generative learning with QNN.
11	Quantum Neural Network III	Code demonstration: quantum classifier and quantum GAN.
12	Final project presentation	Quantum ML application demonstration

Project Details

The project component of this course provides hands-on experience in applying Quantum ML methods to real-world applications.

Project expectations:

- **Problem Justification:** Identifying a specific dataset and articulating why a quantum approach (e.g., high-dimensional feature mapping) is theoretically relevant.
- .**Technical Implementation:** Coding a functional model using **Qiskit** or **PennyLane** that includes data encoding, a parameterized quantum circuit (PQC), and a classical optimization loop.
- **Comparative Analysis:** Evaluating the quantum model against a classical baseline (like a standard SVM or MLP) and documenting the impact of circuit depth and qubit scaling.
- **Critical Reflection:** A detailed discussion on hardware constraints, such as the effect of **Barren Plateaus** or device noise on the training landscape.

Engineering Tools

Students will be introduced to and utilize the following industry-standard and research-grade engineering tools throughout the course:

- **Quantum Development Kit:** PennyLane, Qiskit, and Cirq/TensorFlow Quantum.
- **Scikit-learn:** Essential for establishing classical baselines
- **PyTorch / JAX / TensorFlow:** Used to handle the "classical" half of the hybrid loop—updating weights, backpropagation, and data preprocessing..
- **Qiskit Aer / Lightning (PennyLane):** High-performance simulators that mimic quantum noise. For complex projects, students may need **GPU-accelerated simulators** (like NVIDIA's cuQuantum) to handle more than 20 qubits.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts:

CLO 1: Learn the foundations of quantum information and computation.
CLO 2: Implement and compare different encoding methods to encode classical data into quantum states.
CLO 3: Design, simulate, and optimize Variational Quantum Circuits (VQCs) and Quantum Neural Networks (QNNs).
CLO 4: Identify and mitigate common hurdles in current hardware, specifically Barren Plateaus and hardware-induced decoherence/noise.
CLO 5: Perform rigorous comparative analysis between QML models and classical benchmarks using standard metrics.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 459 AI for Media and Content Delivery Networks (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
The course introduces the key concepts involved with AI-driven networked multimedia systems. Topics include concepts of generating, delivering, and consuming multimedia content. The course explores and covers data-driven techniques and artificial intelligence optimizations (such as deep reinforcement learning, (un)supervised learning and machine learning) that improve the performance, efficiency, and robustness of networking and multimedia system applications. The course introduces the theory and principles in coding, packaging, and securing multimedia data, with a focus on methods for reliable and scalable transport over IP networks for video streaming applications such as: one-way streaming (i.e., video-on-demand and live streaming), two-ways streaming (i.e., video conferencing), and 3D volumetric streaming applications. The course discusses best practices in network and operating system support for media delivery, and the state-of-the-art in current deployments. Additionally, special topics on LLM serving for networking and multimedia systems, reinforcement learning-guided video streaming, ML-based video telephony, Neural volumetric media compression and delivery, AI-enabled Internet protocols for media delivery, ML-based congestion control, AI for next-generation networks and technologies, ML in resource-constrained environments, video analytics, green ML-based communication. A project is required.

Components: Lecture 3 hours per week; Lab 3 hours per week

Prerequisites: AI 330 or AI 336
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Machine learning fundamentals
- Python programming

Grading Scheme (Undergraduate)

Assessment tool	**Weight**
Implementation Assignments (2)	20%
Paper Summary & Discussions	20%
Quizzes (4)	20%
Course Project (Engineering & Implementation focus)	40%
Total	100%

Tentative Course Schedule

Class Format (3 Hours total): To accommodate students without a networking background, the class is divided into two distinct parts:

• Hour 1 (Instructor Background Lecture): Foundational networking and multimedia systems concepts are taught to prepare students for the following week's AI applications.

• Hours 2 & 3 (Student Presentations & Implementations): Students present practical implementations and engineering papers applying AI techniques to the background material covered in the previous week

Week	Hour 1: Instructor background lecture (preparing for next week)	Hours 2 and 3: Student presentations (AI optimizing last week's background)
1	Course Intro & Multimedia Provisioning: Fundamentals of video coding and generating multimedia content	Course Overview & AI in Systems Instructor overview of syllabus and AI trends. (No student presentations yet).
2	Multimedia Delivery: Video streaming pipelines for various applications	Topic: Neural Media Compression & AI optimizations for video coding
3	Multimedia Playback: Adaptive Bitrate (ABR) logic, throughput estimation, and Quality of Experience (QoE) metrics	Topic: ML-Driven Multimedia Delivery & Pipeline Optimizations
4	Transport Protocols: How TCP, UDP, and QUIC work. Understanding QoS metrics (packet loss, throughput, delay, congestion).	QUIZ 1 Topic: Reinforcement Learning (RL)-guided Video Streaming Playback & Super resolution Optimization
5	Routing Protocols & Architectures: Intra/Inter-domain routing (OSPF, BGP) and 5G/6G network technologies	Topic: AI-Enabled Internet Protocols & ML-based Congestion Control
6	Network Resource Allocation & Scheduling: System bottlenecks, bandwidth allocation, and fairness	QUIZ 2 Topic: AI for Next-Generation Networks, Technologies, & Routing
7	Network Queue Management: Buffer bloat, dropping algorithms (DropTail, RED).	Topic: ML for Network Resource Allocation & Intelligent Scheduling.
8	Datacenter & Distributed Systems: Infrastructure for massive workloads (LLM training and inference).	Topic: ML-based Active Queue Management & Green ML-based Communication
9	Video Analytics & Processing Pipelines: Edge-to-cloud offloading and computer vision workloads	QUIZ 3 Topic: LLM Serving for Networking & AI-based Networking optimization for LLM
10	Video Conferencing: Mechanics of WebRTC, strict latency constraints, and jitter	Topic: AI-Driven Video Analytics over Networks
11	Edge Computing: Distributed compute paradigms and hardware constraints	QUIZ 4 Topic: ML-Based Video Telephony & Robustness
12	Course Wrap-up:	Topic: ML in Resource-Constrained Environments (Edge) & Course Project

	Synthesis of networking protocols, constraints, and Project presentation	Presentations

Monitoring Details
Monitoring sessions will be held for 2 hours each week, guided by senior PhD students who will assist in the completion of course implementation assignment and project. Students are expected to bring and use their laptops during the sessions.

Engineering Tools
Networking tools, Multimedia tools, AI tools, Systems tools.

Course Learning Outcomes (CLOs):
By the end of this semester, students are expected to master the following concepts.

A. Demonstrate a comprehensive understanding of AI-driven techniques and their practical application in optimizing multimedia systems.
B. Understand multimedia content generation, delivery, and underlying networking protocols.
C. Apply existing AI techniques to optimize the performance, efficiency, and robustness of video streaming applications.
D. Analyze modern AI-driven networked multimedia systems and understand how contemporary AI tools address practical engineering challenges.
E. Develop a hands-on project that applies AI-based optimizations to multimedia systems, demonstrating the ability to design, implement, and validate a scalable engineering solution.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 469 Conversational Artificial Intelligence (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces key concepts related to Conversational AI, covering both theoretical and practical aspects. The lectures provide a general overview of modern conversational AI systems. The review covers basic machine learning concepts used in Conversational AI, including speech processing techniques. The course addresses Large Language Models and Multimodal Large Language Models which are an essential part of modern conversational AI methods. The lectures are designed to provide a complete overview of the field of Conversational AI. A project is required.

Components: Lecture 3 hours per week; Laboratory 2 hours per week

Prerequisites: AI 330 or AI 332
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:

- Strong Python programming skills.
- Good knowledge of linear algebra, calculus, and math in general.
- Basic knowledge of neural networks, and deep learning.
- Basic knowledge of PyTorch

Course materials
Suggested textbooks:

- *Deep Learning*, Christopher Bishop and Hugh Bishop
- *Deep Learning,* Ian Goodfellow, Yoshua Bengio, and Aaron Courville, 2016
- *Dive into Deep Learning*

Additional reading materials, such as scientific articles, blog posts, and videos will be suggested at the end of each lecture.

Grading Scheme

Assessment tool	**Weight**
Project	30%
Midterm Exam	30%
Final Exam	30%
Lab Assignment (1% each, best 10 of 12)	10%
Total	100%

Tentative Course Schedule

Week	Lecture topics	Extra material	Lab to topics
1	Introduction to Conversational AI		Exercises with PyTorch
2	Foundations of Modern Deep Learning	Deep Learning Tips and Tricks (Part 1)	Deep Learning with PyTorch
3	Sequence Learning	Deep Learning Tips and Tricks (Part 2)	Attention Mechanisms
4	Transformers	Self-supervised Learning	Transformers
5	Language Models		Language Models
6	Large Language Models (LLMs)		Language Models (from scratch)
7	Mid-term Exam		
8	LLM Adaptation	Speech Features	LLM adaptation
9	Agents and Reasoning	Speech Recognition	Reasoning
10	Advanced LLM Architectures	Advanced Speech Recognition Techniques	Mixture of Experts
11	Multimodal LLMs		Audio Tokens
12	Recent Trends and Open Challenges		

Lab Details
The lab sessions will be held in person as well. Students are strongly encouraged to attend labs carefully. The topics addressed during the labs can be objects of question in the mid-term and final exams. Labs are a major learning opportunity in this course, in terms of practical skills and understanding how the algorithms work. During the lab section, the instructor will typically do some practical tutorials on the week's topic. Then, the instructor will introduce the lab assignment of the week. The lab will be made available at the beginning of the week. You are thus encouraged to start solving the lab even before your lab session. This way you can take advantage of the lab session to ask clarification questions to the TA. Note that the lab assignment will require some hours to be solved and cannot be completed during the lab session (you will likely need to conclude this at home). You have until the end of the week to submit the final lab assignment in Moodle. We will do our best to grade the lab as soon as possible to provide feedback to the students. For this reason, we cannot grant any extensions to the deadlines. There are 12 labs worth 1% each up to a maximum of 10% of the total grade. This means that you can skip two labs without any score penalization.

Notes:
- You must attend your assigned lab section ONLY. Please respect this rule, it helps balance work among the TAs and keeps them organized.
- Students are encouraged to help each other with labs verbally, but copying code is forbidden. You must be the author of all your submitted answers. Violations will be reported.
- Do not copy past solutions that you can find online or use LLMs to solve the lab. Violations will be reported.
- You have to submit the lab assignment according to the deadline specified by the instructor. Extensions cannot be granted. Late submissions will not be graded.

Details on assessment tools:

Project

The project is an important part of the machine learning course. The goal of it is to show that you gained familiarity with the conversational AI techniques explained during the lecture and labs and that you can implement an actual model. The project grade counts as 30% of the final grade.

The instructor will make available some project proposals in the first weeks of the course. As an alternative, students are welcome to propose a project. In this case, the students have to write a project proposal (max two pages) and submit it before the deadline for a project proposal. The instructor will review it and must explicitly approve it (on Moodle). The instructor might ask you to fine-tune the proposal (or write another proposal) if the project does not meet the expectations (e.g, the project is too similar to one of the labs, the project is unfeasible with the current time and computation constraints, the proposal is not clear, etc).
The project must be individual work done by the student (no group projects). Students are welcome to meet, exchange opinions, and suggestions, share issues, etc when working on their projects. However, the project must be the individual work of the students. Every violation will be reported. Each student will be assigned to a project advisor. The project advisor will monitor the evolution of the project and provide some suggestions along the way. Nevertheless, the project advisor is not supposed to solve the problem or debug the code for you.
Further details are available in the Project guidelines on Moodle.

Exams

We plan to do a mid-term exam that will focus on the topics of the first 6 lectures, labs, tutorials, and extra lecture. A final exam will be done at the end of the course on the topics addressed in the last 5 lectures and labs. The exams will be quizzes composed of different questions (ranging from simple to more challenging ones).

Course Learning Outcomes (CLOs): TBD

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 470 Engineering AI-Based Software Systems (4 credits)

Course Instructor: TBD
Office Hours: TBD

Course Calendar Description:
This course introduces key concepts related to the engineering of AI-based software systems. Topics include requirements and architectures of AI-based software systems, data validation and management, model selection, quality assurance, deployment and continuous delivery of AI-based software systems. Additionally, special topics on interpreting and monitoring models, and operations in large-scale AI based system are included. A course project involving a real-world open-source AI-based software system is required.

Components: Lecture 3 hours per week

Prerequisites: N/A
Co-requisites: N/A

Course materials
Suggested textbook: *Building Intelligent Systems: A Guide to Machine Learning Engineering*. Geoff Hulten. 2018.

Many resources for the course (lecture slides, assigned readings, example projects, etc.) will be available on the course Moodle page.

Grading Scheme

Assessment tool	Weight
Class participation	10%
Paper critiques & activities	20%
Project proposal	10%
Research project	40%
Quizzes and exams	20%
Total	

Tentative Course Schedule

Week	Topic
1	Introduction & overview
2	AI for Software Engineers
3	Software requirements and architectures for AI-based systems
4	Data validation and management
5	Interpretation vs. Explanation
6	Project updates (student presentations)
7	Deployment and testing (MLOps)
8	Technical Debt in AI-based systems
9	LLMs in AI-based systems
10	Continuous delivery

11	Quiz
12	Project presentations (student presentations)

Details on assessment tools:

Class Participation

Students are expected to attend all classes. In each class, we will have discussions based on the assigned readings. Students are expected to participate and make meaningful contributions to these discussions.

Research Proposal and Project

A large portion of the course deliverables is a course research project. You are expected to work on the course project in groups. Each group is expected to write a research paper by the end of the semester. The topic is to be determined with the instructor. Examples include a new contribution on a specific related topic, a survey paper of a related topic (typically involves surveying 30 – 60 papers), or building a tool to support the engineering of AI-based software systems.

The first deliverable of the course project is a project proposal. The project proposal should be 3 pages in length (plus references). The project proposal should be submitted by the end of week 6. A project progress presentation will be held in week 6. The final project will be presented in week 12 and the final project report (10 pages in length) should be submitted by the end of week 12. The final submission is expected to be of publishable quality. All project-related documents (i.e., project proposal and project report) should use the IEEE conference publication format. If the paper is deemed publishable, the instructor will work with the students to make appropriate changes to the final report and submit the paper for publication.

Course Learning Outcomes (CLOs): TBD

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

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AI 472 Generative AI for Software Engineering (4 credits)

Course Instructor: TBD
Office Hours: TBD
Labs: TBD

Course Calendar Description:
This course introduces key concepts about using Generative AI (GenAI) in software engineering practice and research. The course includes sessions on the topics of prompt engineering and fine-tuning Large Language Models for software engineering research. Subsequently, the course focuses on applying GenAI in software engineering research, covering the topics of software requirements, software design, software development, software testing, and software repair and maintenance. Finally, the course covers special topics related to the challenges of designing, implementing, and deploying systems with GenAI components and the ethical and societal implications of GenAI. A project is required.

Components: Lecture 3 hours per week; Laboratory 1 hour per week

Prerequisites: AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Understanding of the Software Engineering lifecycle
  - Software requirements
  - Software design and development
  - Software testing and maintenance
- Basic understanding of Machine Learning
  - Training supervised machine learning models.
- Programming logic

Course materials
Required Textbook: *AI Engineering: Building Applications with Foundation Models. 1st ed.* Huyen, C. 2024. O'Reilly Media, Sebastopol, CA

Grading Scheme

Assessment tool	Weight
Class participation	10%
Lab Assignments	15%
Paper Reviews	15%
Quiz	20%
Course project	40%
Total	100%

Tentative Course Schedule

Week	Topics
1	Introduction to GenAI in Software Engineering
2	Prompt Engineering for Practitioners and Researchers
3	Embedding SE Expertise in Foundational Models (RAG, Agents)
4	Experiment Design for Software Engineering Studies with GenAI
5	GenAI applied to Software Requirements
6	GenAI applied to Software Design
7	GenAI applied to Software Development
8	GenAI applied to Software Testing
9	GenAI applied to Software Maintenance and Repair
10	Special topics: Engineering Agentic Systems
11	Quiz
12	Final Project presentation

Details on assessment tools:

Lab Assignments

Each week, the lecture will be complemented by a 1-hour laboratory session, equipped with prepared materials to guide students in running experiments with LLMs for software engineering research.

Project description

Undergraduate students will develop an LLM-based solution for software engineering practitioners and write a detailed report on the process.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following concepts.

- Comprehend GenAI Foundations. Explain the fundamental principles, capabilities, and evolution of Generative AI and Large Language Models (LLMs), specifically within the context of software engineering.
- Apply Domain-Embedding Techniques to LLMs. Apply specific techniques (e.g., as Prompt Engineering, RAG and Fine-tuning) to optimize off-the-shelf LLMs for domain-specific software tasks.
- Understand the Challenges of Developing GenAI-based Systems. Design and evaluate strategies for implementing and deploying software systems that contain GenAI components.
- Evaluate Risks and Ethics. Critically assess the limitations and risks associated with LLMs (e.g., non-determinism, lack of transparency/explainability) and analyze the ethical and societal implications of deploying these tools in professional practice.Learn Fundamentals of SE Research. Understand the different types of study designs, and scientific methodology for research the application of GenAI to SE tasks.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

AI 474 AI-Driven Software Improvement and Repair (4 credits)

Course Instructor: TBD
Office Hours: TBD
Tutorials: TBD
Labs: TBD

Course Calendar Description:
This course introduces the principles and techniques of AI-driven software improvement and repair. It covers key topics such as automated debugging, fault localization, and program repair, with a focus on data-driven and learning-based approaches. Through lectures and selected research papers, students examine the challenges of improving and maintaining large-scale software systems and learn how to leverage interdisciplinary methods from information retrieval, statistics, and machine learning. The course also highlights emerging challenges in diagnosing and repairing AI-driven applications. A final course project allows students to apply AI techniques to real or simulated software systems.

Components: Lecture 3 hours per week; Laboratory 1 hour per week

Prerequisites: AI 370
Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:
Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Students should know to program in one of the common programming languages, e.g., Java or Python. Basic concepts on software development process, debugging and testing are required.

Course materials
The reading materials include research papers and articles.

Grading Scheme

Assessment tool	Weight	Notes
Class Participation	10%	Each week, students are expected to participate in the paper discussions when applicable
Lab assignment(s)	20%	Students are required to finish lab assignments that cover relevant techniques on AI-driven software improvement and repair that are taught in the course.
Course project	40%	Each group of students needs to submit an original 10-page project report in either IEEE or ACM double column format.
Exam	30%	
Total	100%	

Tentative Course Schedule

Week	Topics
1	Software Improvement and repair: an overview on background and history
2	Bugs, errors, and failures
3	Fault localization
4	AI-assisted fault localization
5	Automated program repair
6	History-driven and AI-assisted automated program repair
7	Benchmarks, evaluation, and reflection
8	Project proposal presentations
9	AI-driven software improvement and repair
10	Fairness and trust
11	In-class final
12	Final project presentations

Lab Details
Lab topic 1: IR-based fault localization
Lab topic 2: Classic automated program repair
Lab topic 3: Learning-based repair with LLMs
Lab topic 4: LLMs for automated software refactoring.

Health and Safety Guidelines
All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:
Safety Programs - Concordia University (https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources
Please visit Student services at Concordia University for the services available Gina Cody School students.

Appendix 3: Surveys and market analysis data

This appendix includes the following:

1. Industry expert survey questionnaire and results
2. Undergraduate student interest survey questionnaire and results
3. CEGEP student Open House survey questionnaire and results
4. AI specialist job postings analytics for Canada and Quebec

Industry Experts Survey Questionnaire

Undergraduate AI Program Industry Survey

Q1



Thank you for participating in this survey. Your insights will help us design two new undergraduate programs in Artificial Intelligence at Concordia University's Gina Cody School of Engineering and Computer Science:

- Bachelor of Engineering (BEng) in Artificial Intelligence Engineering
- Bachelor of Science (BSc) in Artificial Intelligence

The survey should take approximately **15–20 minutes** to complete.

Q2

Name

Q3

Current job title

Q4

Organization

Q5

Which of the following best describe(s) your core responsibilities? (Select all that apply.)

- [ ] Executive / Senior management
- [ ] People / Talent management
- [ ] Engineering / Development
- [ ] Data / AI / ML / Analytics
- [ ] Product management
- [ ] Research / R&D
- [ ] Operations
- [ ] Other (please specify):

Q6

Sector: Which sector best describes your organization? (Select one.)

- ○ Aerospace
- ○ Automotive / Transportation / Logistics
- ○ Robotics / Industrial Automation
- ○ Telecommunications
- ○ Manufacturing (including advanced / high-tech manufacturing)
- ○ Energy / Utilities
- ○ Construction / Civil / Infrastructure
- ○ Mining / Natural Resources
- ○ Agriculture / Agri-tech
- ○ Medical Devices / Healthcare Technology / Hospitals
- ○ Software / ICT / AI Products and Services
- ○ Finance / Insurance / Fintech
- ○ Defense / Security / Public Safety
- ○ Government / Public Sector / Crown Corporation
- ○ Specialized Engineering Consulting / R&D Services
- ○ Other (please specify):

Q7

What is the size of your organization (globally)?

- ○ 1–9 employees
- ○ 10–99 employees
- ○ 100–999 employees
- ○ 1,000–9,999 employees
- ○ 10,000+ employees

Q8

Concordia University's Gina Cody School is developing two new undergraduate programs in Artificial Intelligence:

- **Bachelor of Engineering (BEng) in Artificial Intelligence Engineering** – focused on designing and building AI-enabled systems (software, hardware, robotics, data, infrastructure), designed to meet CEAB engineering accreditation requirements
- **Bachelor of Science (BSc) in Artificial Intelligence** – focused on algorithms, theory, and hardware/software for AI, with fewer engineering core courses and more room for technical and general electives

Both programs share a strong AI core and address ethics, safety, security, fairness, and explainability in AI systems.

Q9

Future demand: How do you expect demand for AI-related roles in your industry to change over the next 5 years?

- ○ Increase significantly
- ○ Increase somewhat
- ○ Remain about the same
- ○ Decrease somewhat
- ○ Decrease significantly
- ○ Unsure

Q10

Existing AI job titles: What job titles in your organization currently require AI-related knowledge and skills? (e.g., ML Engineer, AI deployment, Data Scientist, AI Product Manager) (Optional)

Q11 ✶

Need for training / upskilling: How would you assess the need for training and skill updating in AI-related roles within your organization?

- ○ No need
- ○ Low need
- ○ Moderate need
- ○ High need
- ○ Critical need

Q12 ✶

Hiring difficulty for AI roles: Does your organization face challenges in recruiting skilled professionals for AI-related roles?

- ○ Yes
- ○ No
- ○ Unsure

Q13

Display this question

If Hiring difficulty for AI roles: Does your organization face challenges in recruiting skilled prof... Yes Is Selected

If Yes, which positions are most difficult to hire for, and what skills are most in demand? (Optional)

Q14

How likely is your organization to support or subsidize the following for employees?

	Extremely unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Extremely likely
Short professional certifications or training programs	○	○	○	○	○
Undergraduate certificate in AI or related field	○	○	○	○	○
Graduate certificate or diploma in AI or related field	○	○	○	○	○
Bachelor of Engineering (AI Engineering or similar)	○	○	○	○	○
Bachelor of Science (AI or related field)	○	○	○	○	○
Master of Engineering	○	○	○	○	○
Master of Science	○	○	○	○	○

Q15

How quickly do you expect a new graduate in an AI-related role to become productive in your organization?

- ○ Within 3 months
- ○ 3-6 months
- ○ 6-12 months
- ○ More than 12 months
- ○ Unsure

Q16

Which AI-related job roles in your organization require or would benefit from graduates with a CEAB-accredited engineering program (e.g., BEng)? Please list job titles. (Optional)

Q17

Which AI-related job roles in your organization do not require graduates from a CEAB-accredited program and could be filled by BSc graduates? Please list job titles. (Optional)

Q19

In your view, what should most clearly differentiate a BEng in AI Engineering graduate from a BSc in AI graduate? (e.g., types of roles, responsibilities, depth of engineering design, regulatory responsibilities) (Optional)

Q20

For entry-level graduates of our AI programs, how important are the following competencies in your organization?

	Not important	Slightly important	Moderately important	Very important	Critically important
Technical proficiency (e.g., programming, algorithms, ML, data handling)	○	○	○	○	○
Problem-solving and analytical skills	○	○	○	○	○
Ethical judgment and integrity	○	○	○	○	○
Risk management and awareness of AI-related risks	○	○	○	○	○
Communication skills (written and oral)	○	○	○	○	○
Teamwork and collaboration	○	○	○	○	○
Practical experience with real-world projects	○	○	○	○	○
Commitment to continuous / life-long learning	○	○	○	○	○

Q21

Are there any additional competencies you believe are crucial for graduates of our AI programs? Please list them and briefly explain why. (Optional)

Q22

How important is interdisciplinary knowledge (e.g., legal/regulatory, ethical, managerial, domain-specific) for AI professionals in your organization?

- ○ Very important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not important at all

Q23

If applicable, which interdisciplinary areas do you find most relevant (e.g., healthcare, finance, law, operations, product management) (Optional)

Q24

For entry-level AI roles, which of the following are most important? (Select up to 5.)

- [ ] Strong programming skills (e.g., Python, C/C++)
- [ ] Machine learning and deep learning fundamentals
- [ ] Data engineering and data pipelines
- [ ] Software engineering best practices (version control, testing, CI/CD)
- [ ] MLOps and deployment of models to production
- [ ] Cloud platforms (e.g., AWS, Azure, GCP)
- [ ] AI ethics and responsible AI practices
- [ ] Cybersecurity and secure AI systems
- [ ] Domain knowledge (e.g., finance, healthcare, manufacturing)
- [ ] Communication and stakeholder engagement
- [ ] Project management and teamwork

Q25

Based on your experience, which technical topics or areas should be emphasized in our AI programs to prepare students for the evolving AI workforce? (Optional)

Q26

What types of projects or portfolio evidence (e.g., capstone projects, internships, open-source contributions) most influence your decision to hire entry-level AI graduates? (Optional)

Q27

What types of experiential or work-integrated learning opportunities could your organization provide to students in our BEng/BSc AI programs? (Select all that apply.)

- [ ] Course-based projects / capstone projects (students work on your organization's problem within a course)
- [ ] Onsite internships or co-op placements
- [ ] Virtual internships
- [ ] Short field projects (site visits + focused tasks)
- [ ] Research collaborations
- [ ] Mentorship opportunities
- [ ] Job shadowing experiences
- [ ] Industry-sponsored competitions or hackathons
- [ ] Live case studies or simulations
- [ ] None of the above
- [ ] Other (please specify):

Q28 ✶

In addition to experiential learning, what other forms of collaboration would your organization be interested in? (Select all that apply.)

- [ ] Guest lectures and workshops by industry professionals
- [ ] Participation in program advisory committees
- [ ] Providing input into course or program design/content
- [ ] Joint research or innovation projects
- [ ] Facilitating networking events with industry experts
- [ ] Offering mentorship and career guidance to students
- [ ] Providing access to specialized tools, datasets, or software for educational use
- [ ] None of the above
- [ ] Other (please specify):

Q29 ✶

Would your organization be interested in reviewing and providing feedback on a draft curriculum or selected course outlines in the future?

- ○ Yes
- ○ No
- ○ Maybe (depending on time and scope)

Q30

What specific AI-related topics, threats, or challenges do you foresee becoming significant in the near future (e.g., AI safety, regulatory changes, workforce impact, AI impact on Society/environment)? (Optional)

Q31

Over the next 5–10 years, how do you anticipate the AI landscape will change, and what impact might this have on the skills and knowledge required of AI professionals? (Optional)

Q32

Please share any additional comments, suggestions, or concerns regarding our proposed AI programs (BEng and BSc), including anything you feel is missing or could be improved. (Optional)

Q2 - Name

20 Responses

Name
Jean-Samuel Chenard
Jean-Samuel Chenard
Mike Lee
Fiona Simpson
Naysan Saran
Camille Matte
LUCA CROTTI
Patrick Jean-Baptiste
jean-francois cantin
Marco de Tavira
Jacques Gauthier
Oz Gurtuna
Fiona Simpson
Salma Iamrini
Daniel Ratchford
Tamara Vandersluis
Parul Khanna
Anders Jeppsson
Mehdi Abedinpour Fallah
ZHENGLIN XIONG

Q3 - Current job title

Current job title

President
President
CEO
Chief Executive Officer
Co-founder and CEO
Associate Manager, System Design
Consultant
Security Director
transport engineer
Director of Operations, PSS
VP Business Development
Founder / CEO
Chief Executive Officer
Responsable marketing
VP & Head of Delivery
VP Innovation
Vice President - Cybersecurity
Vice President Engineering
R&D Principal specialist, Controls Software Engineering
CEO

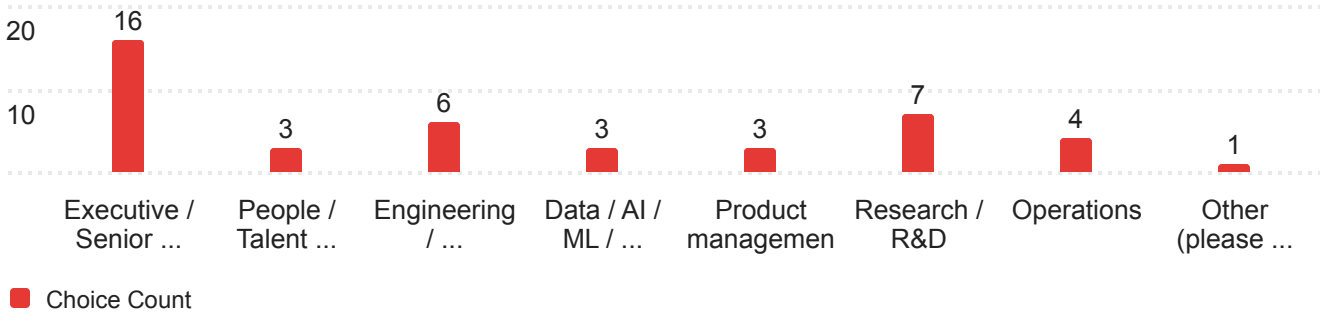
Q4 - Organization

Organization
Motsai
Motsai

Fundica
BioMimir Inc.
CANN Forecast
Zimmer Biomet
Alfiere Innovation
Sunphinx inc.
Gbi
Laurentide Controls
Upbrella International
Plumfind
BioMimir Inc.
Makila
Applexus Technologies
R2i
BNP Paribas
Syntronic R&D Inc
Pratt & Whitney Canada
AEROPORT AI

Q5 - Which of the following best describe(s) your core responsibilities? (Select all that apply.) - Selected Choice

20 Responses



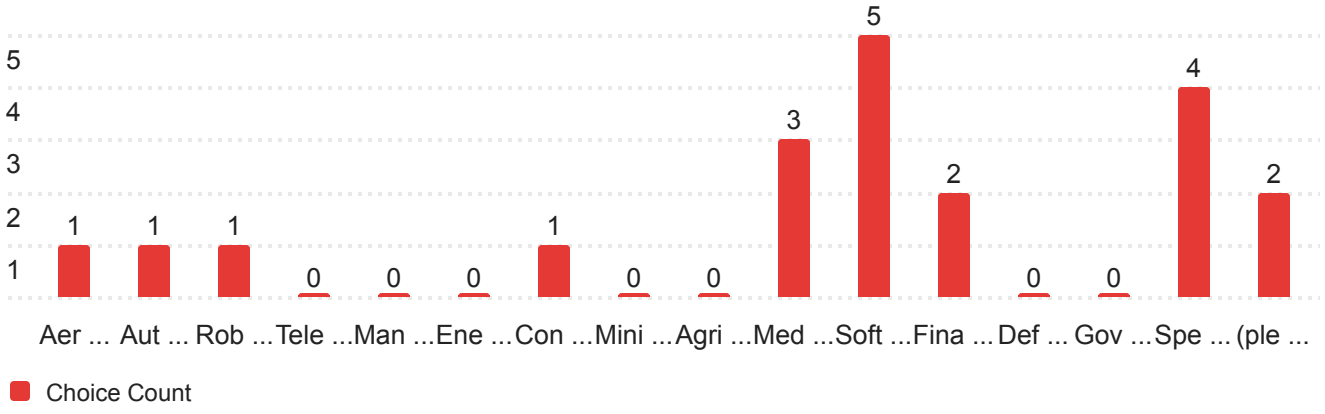
Q5_8_TEXT - Other (please specify): - Text

Other (please specify): - Text

+consultant

Q6 - Sector: Which sector best describes your organization? (Select one.) - Selected Choice

20 Responses



Q6_16_TEXT - Other (please specify): - Text

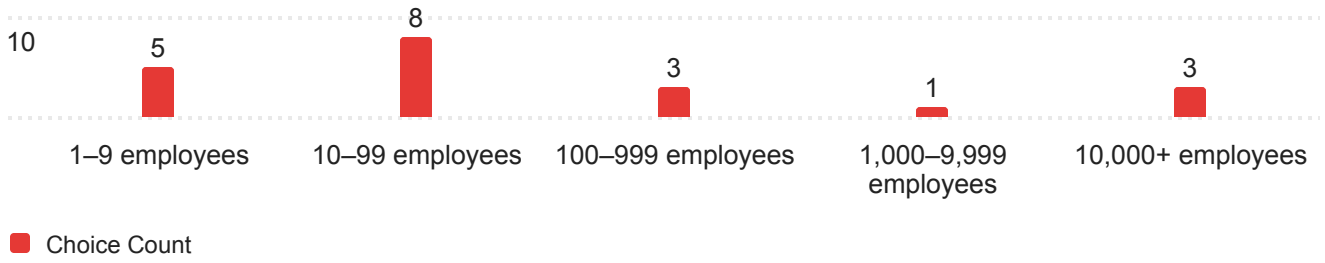
Other (please specify): - Text

Information technology - servers

R&D Design services

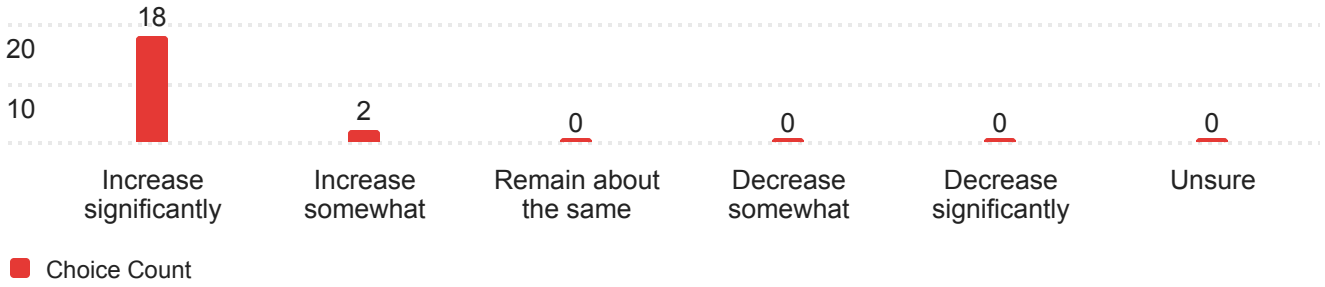
Q7 - What is the size of your organization (globally)?

20 Responses



Q9 - Future demand: How do you expect demand for AI-related roles in your industry to change over the next 5 years?

20 Responses



Q10 - Existing AI job titles: What job titles in your organization currently require AI-related knowledge and skills? (e.g., ML Engineer, AI deployment, Data Scientist, AI Product Manager) (Optional)

16 Responses

Existing AI job titles: What job titles in your organization currently require AI-related knowledge and skills? (e.g., ML Engineer, AI deployment, Data Scientist, AI Product Manager) (Optional)
We don't yet call the roles AI-something, but we need AI Electronics engineers and AI Firmware developpers
Firmware designer, hardware designer
ML Engineer

Data Scientist
AI Product Manager
MLOps engineer

System designer/engineer, Software designer/engineer

Embedded hardware and software development Eng.; data analysis, testing Engineer, feasibility engineer

Data Scientist

None exists at this time - We need to create the role

AI/ML Specialist (we don't use the term "engineer" due to QC regulations)

ML Engineer

Data Architect, Data scientist, ML engineer

Product Development

Solution architect, sales team

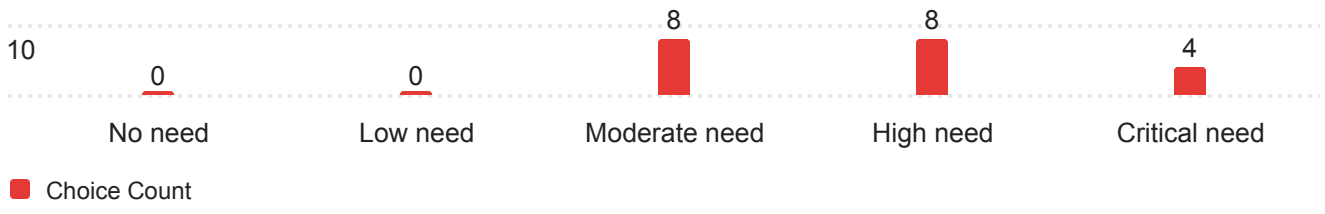
Data Scientist, ML Engineer, Automation Engineer, AI Engineer, Applied Machine Learning Scientist, AI Research Scientist, Data and ML Engineer, Credit Risk Modeling Scientist, Financial Data Scientist,AI Transformation Lead, AI Program Manager, Head of AI Strategy, AI Risk Modeling Lead, Chief AI Officer

ML, AI neural network algorithms

Industrial AI Engineer, ML Engineer

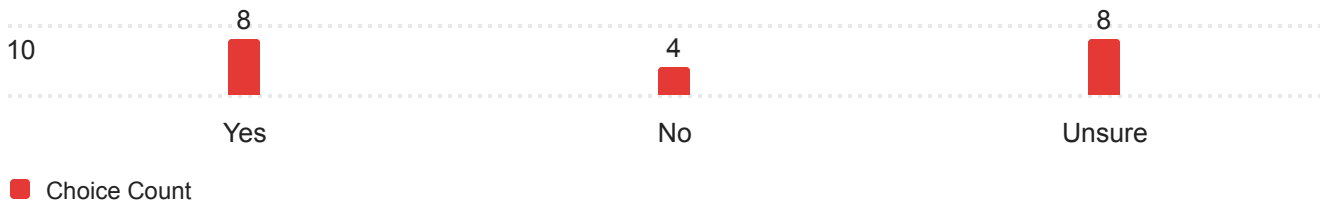
Q11 - Need for training / upskilling: How would you assess the need for training and skill updating in AI-related roles within your organization?

20 Responses



Q12 - Hiring difficulty for AI roles: Does your organization face challenges in recruiting skilled professionals for AI-related roles?

20 Responses



Q13 - If Yes, which positions are most difficult to hire for, and what skills are most in demand? (Optional)

5 Responses

If Yes, which positions are most difficult to hire for, and what skills are most in demand? (Optional)

Knowledge of hardware systems with AI accelerators. Basically Electrical engineers with knowledge of hardware that is accelerated with AI (NPUs, embedded devices).

There is a bit of a disconnect between the realitity of the market and electrical engineering, so we usually aim to hire more senior and train in house.

We hire AI professionals at the intersection of ML and biochemistry and it is very difficult to find professionals with dual skills sets. We also have difficulty hiring professionals who have the skills to build training data sets and train new ML models. Existing programs focus more on operationalizing existing ML models than building new models.

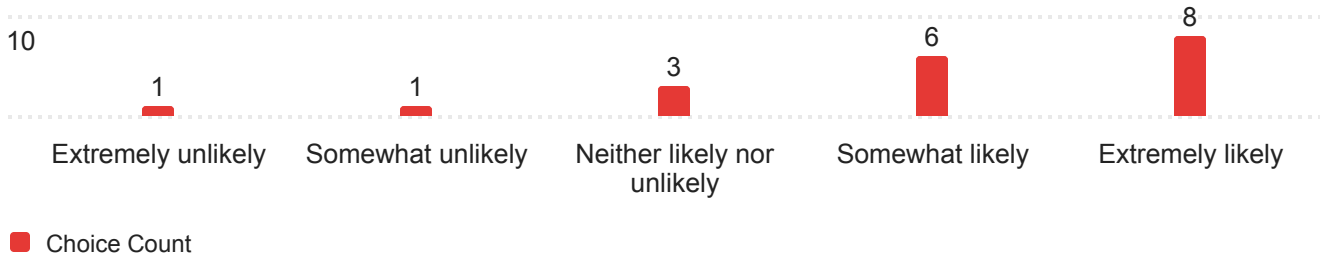
We provide applied AI services, so deployment, quality control and cloud computing are also essential skills.

We need AI specialists at the intersection of biochemistry and physiology and ML. It's been extremely hard to find individuals with dual skillsets.
We have also found very few individuals with sufficient theoretical and mathematical training to develop new AI/ML models. Current graduates may have run models and read about artificial neural networks, but they haven’t been forced to do sufficient problem solving on the theoretical level, so they are incapable of determining appropriate training data, designing layer structure, and building new ML models.
We have also found the coding skills of current graduates to be severely lacking. AI/ML professionals need to be fluent in at least one coding language (Java, Python, C#) and the current curriculum (and Git and vibe coding) isn’t turning out professionals who are fluent enough to solve the type of advanced problems with code that are required to build ML models in a time and cost-effective manner.

Agentic development. People with skills in python, orchestration and modeling.

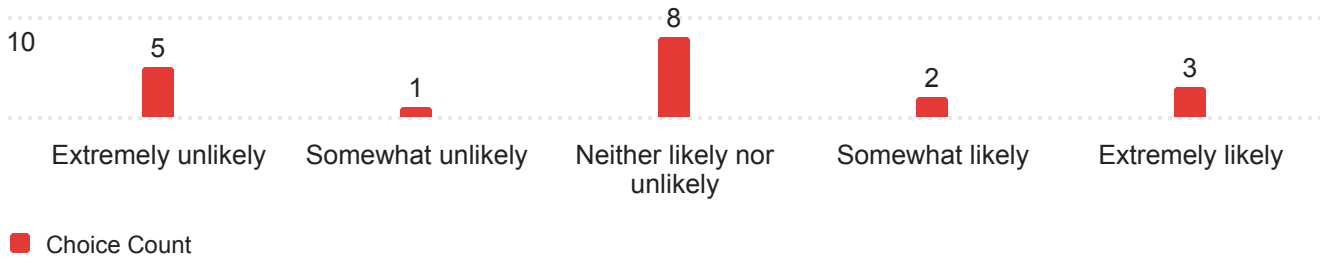
Q14_1 - Short professional certifications or training programs

19 Responses



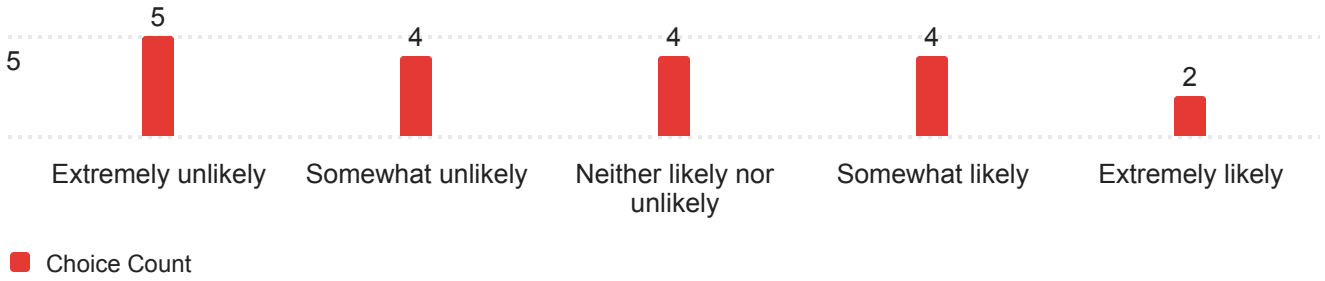
Q14_2 - Undergraduate certificate in AI or related field

19 Responses



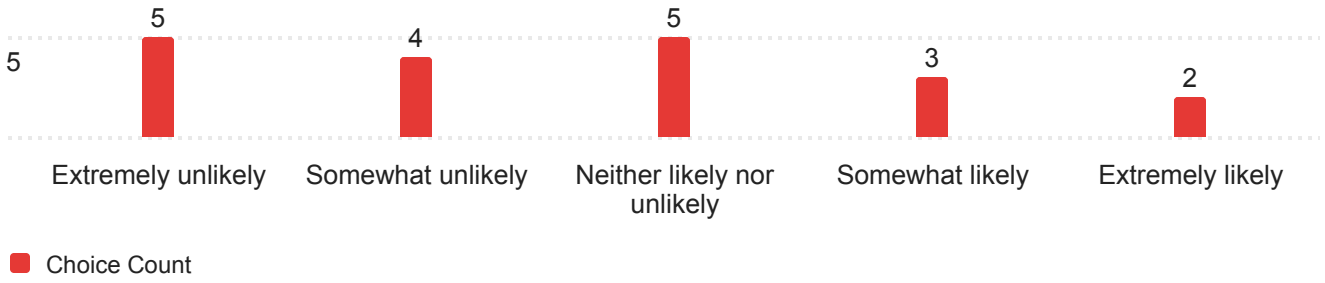
Q14_3 - Graduate certificate or diploma in AI or related field

19 Responses



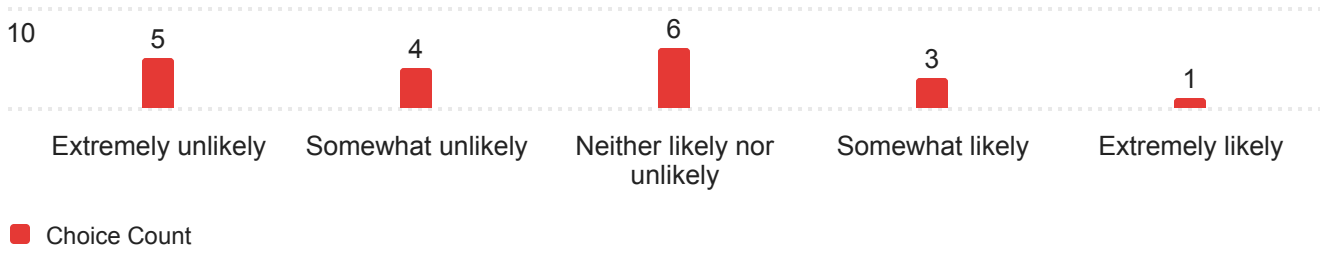
Q14_4 - Bachelor of Engineering (AI Engineering or similar)

19 Responses



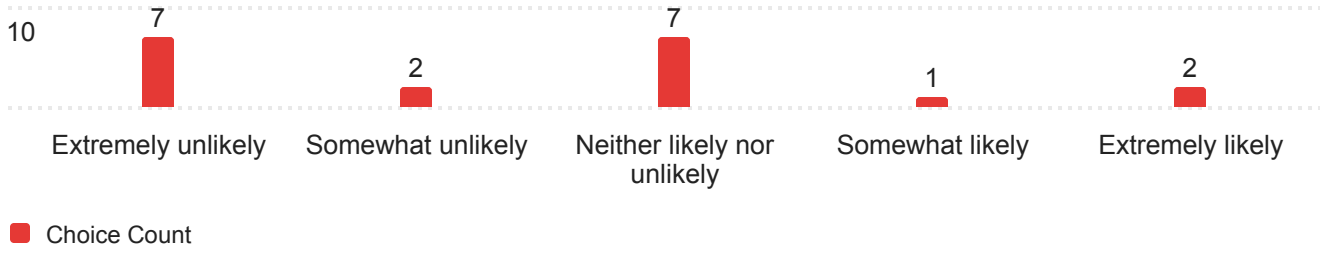
Q14_5 - Bachelor of Science (AI or related field)

19 Responses



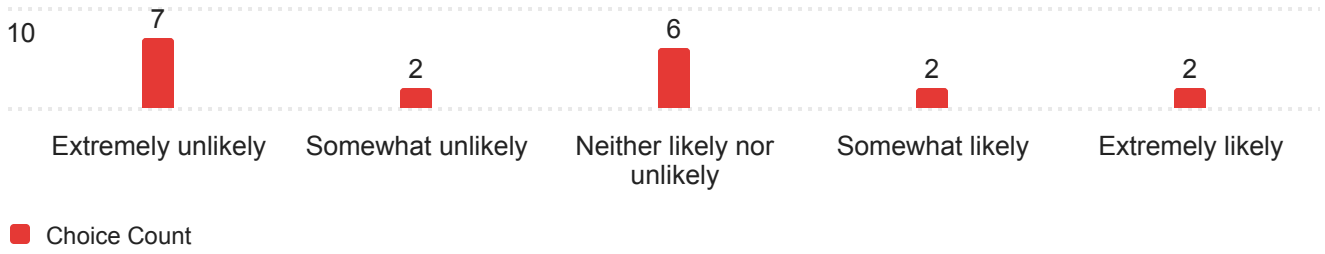
Q14_6 - Master of Engineering

19 Responses



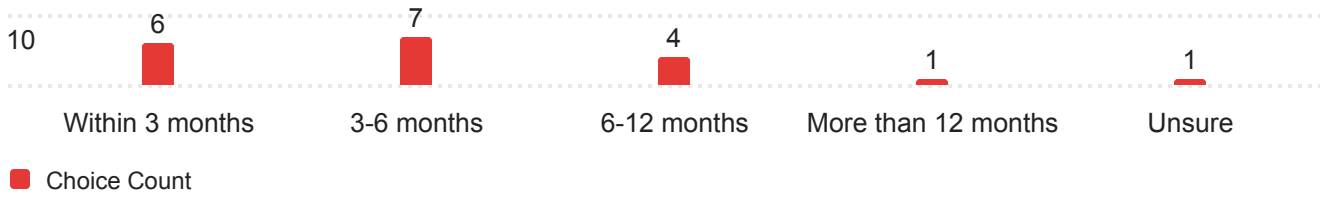
Q14_7 - Master of Science

19 Responses



Q15 - How quickly do you expect a new graduate in an AI-related role to become productive in your organization?

19 Responses



Q16 - Which AI-related job roles in your organization require or would benefit from graudates with a CEAB-accredited engineering program (e.g., BEng)? Please list job titles. (Optional)

10 Responses

Which AI-related job roles in your organization require or would benefit from graudates with a CEAB-accredited engineering program (e.g., BEng)? Please list job titles. (Optional)

Hardware design for NPU accelerated products
Firmware engineering with neural nets or classifiers.

We hire electrical engineers and they need to understand NPUs and hardware accelerators.

Its not mandatory that they are engineers, but the program and training helps.

Software de

System designer/engineer, Software designer/engineer

Embedded software developer and testing engineer

We mostly work with SMEs, so instead of accreditation, most clients are interested in case studies and use cases.

None

For R2i its more about SW and HW requirements to run these workloads as well as the DEVOPS pipeline. For my customers its Data Pipeline and also devops. As well as what is possible. Also translators between IT and Mgt and what is possible.

All techincal roles related to AI

Industrial AI Engineer, ML engineer

Q17 - Which AI-related job roles in your organization do not require graduates from a CEAB-accredited program and could be filled by BSc graduates? Please list job titles. (Optional)

7 Responses

Which AI-related job roles in your organization do not require graduates from a CEAB-accredited program and could be filled by BSc graduates? Please list job titles. (Optional)

Typically the more high level software roles.

For firmware designers/engineers, they need to be aware of the methods to structure and train neural networks.

Those roles may not need to be engineers.

Sales, Customer Service, Accounting

My organization (in Montreal),requires to hold an engineering degree, BSc graduate is not a suffiscient qualification

Please see above

all our jobs today, simply becuase there are no graduates or entry level jobs.

Data scientist

Q19 - In your view, what should most clearly differentiate a BEng in AI Engineering graduate from a BSc in AI graduate? (e.g., types of roles, responsibilities, depth of engineering design, regulatory responsibilities) (Optional)

11 Responses

In your view, what should most clearly differentiate a BEng in AI Engineering graduate from a BSc in AI graduate? (e.g., types of roles, responsibilities, depth of engineering design, regulatory responsibilities) (Optional)

The electronic design roles tend to prefer engineering graduates than BSc because we have analog and circuitry that deal with higher voltages and more norms.

A few projects will need Enginering knowledge. Generally the school curriculum does not go deep enough and many are learning on the job. Engineering graduates tend to be stronger on the electronic hardware side.

BEng has a focus on problem solving, BSc has a focus on analytics

Algorithm creation, communication architecture definition

For some companies, having engineers in the team who are members of the L'Ordre des ingénieurs du Québec may be desirable. For us, what's more relevant is a good understanding of engineering practices, project management skills and complex system design.

I expect a BSc to focus on the theoretical and mathematical aspects of AI/ML. Given the degree description, I would hope that the space for additional coursework would allow for other electives in areas like biochemistry, neuroscience, language/linguistics, geography, or other courses that will help to inform the development of AI/ML models and give better context to the content and ethics of future AI and ML development. I would hire individuals with this type of degree to focus on model development including architecture and data analysis. I expect this type of role to be focused on achieving specific research or development goals, in consultation with an engineering team for general feasibility.
I expect a BEng to focus on software/hardware implementation of AI models. I would still expect these students to have strong fundamentals, but I would hire a BEng to implement AI-models so that they are functional systems, whether they are cloud-based software or hardware with AI-control systems like robotics. I expect this role to work hand-in-hand with other types of engineers in teams to achieve regulatory compliance.

I believe all dev roles would be BSc, any back end, robotics or enablement roles relying on hardware would be BEng.

I see engineering as understanding the underlying architecture and required components. I see the BSc as understanding the science behind the models.

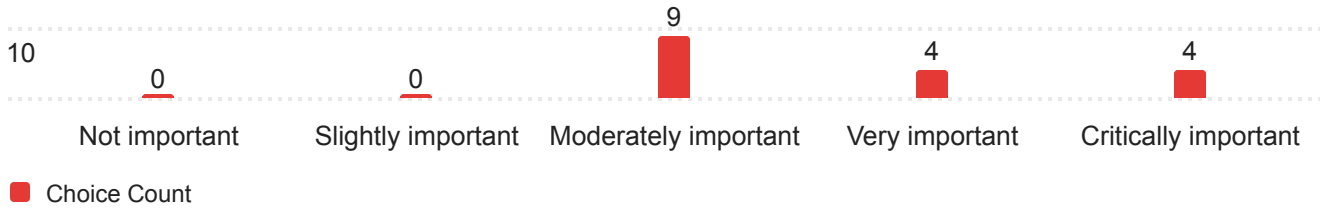
BSc should focus on the theoretical and scientfic foundations of Ai and data science, while Beng should focus more on engineering, system design and practical deployment

deep understanding of efficiently designing and implementing bespoke "AI"/neural network... solutions

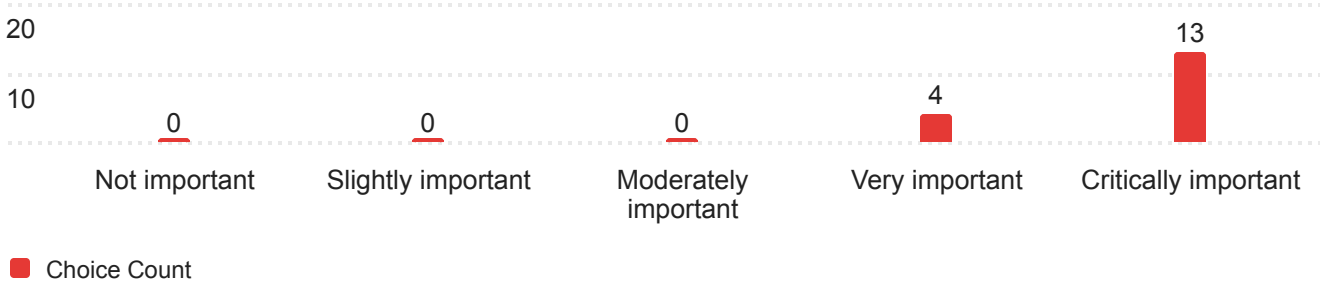
depth of engineering design and CO-OP

Q20_1 - Technical proficiency (e.g., programming, algorithms, ML, data handling)

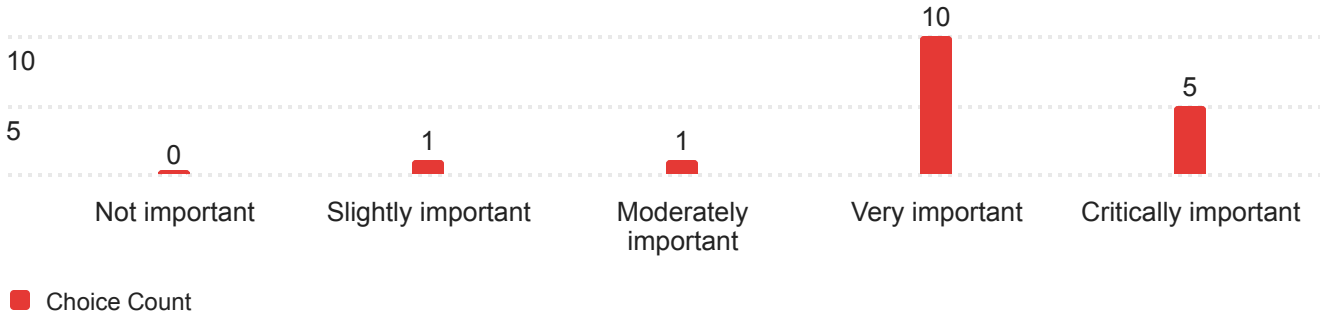
17 Responses



Q20_2 - Problem-solving and analytical skills



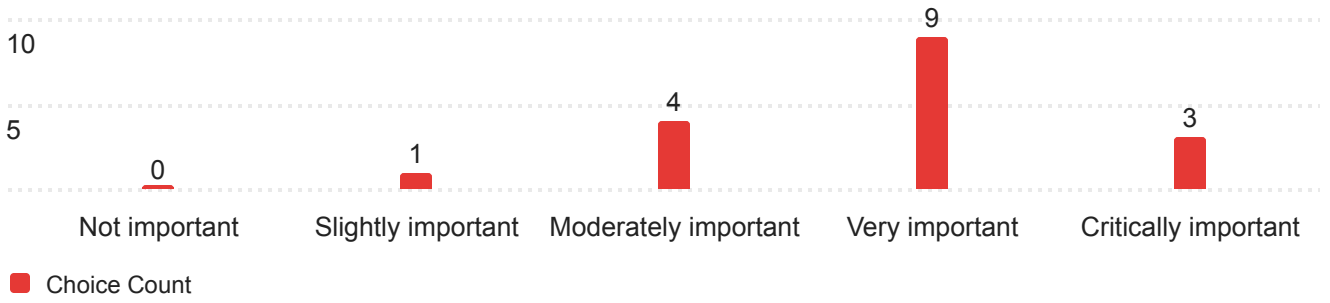
Q20_3 - Ethical judgment and integrity



Q20_4 - Risk management and awareness of AI-related risks

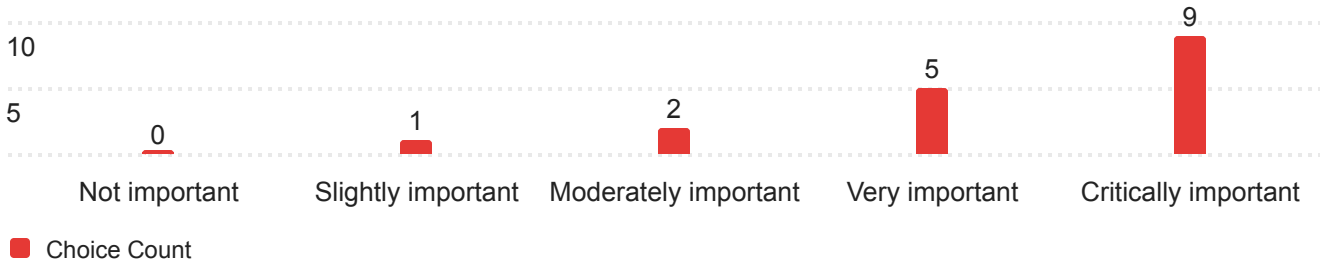


Q20_5 - Communication skills (written and oral)

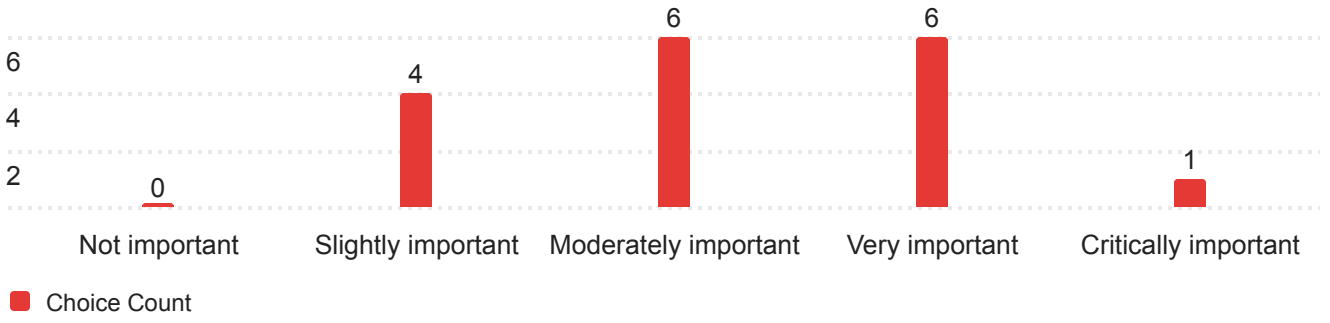


Q20_6 - Teamwork and collaboration

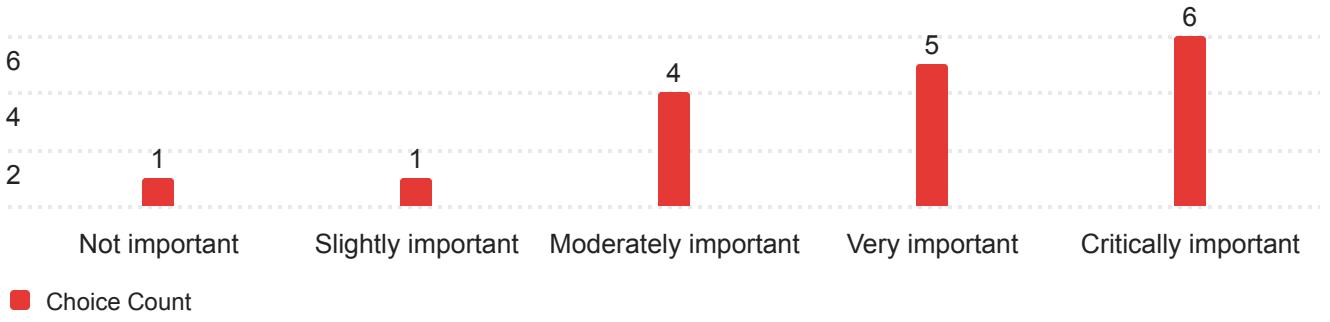
17 Responses



Q20_7 - Practical experience with real-world projects



Q20_8 - Commitment to continuous / life-long learning



Q21 - Are there any additional competencies you believe are crucial for graduates of our AI programs? Please list them and briefly explain why. (Optional)

10 Responses

Are there any additional competencies you believe are crucial for graduates of our AI programs? Please list them and briefly explain why. (Optional)
Knowledge of where the data will flow (local models, remote models, LLMS). Cybersecurity and data confidentiality exposure. This to avoid leaking information to models that are not trusted.
Knowledge on how to embed AI algorithms on the edge and practical knowledge of deployments of AI systems.
Using LLMs and Agents to increase productivity
hardware knowledge
Cloud computing: most AI talent don't understand that what they are building has to deployed to create real value. Either for batch processing or as an AI end-point. A good understand of data sovereignty is also important. Should/could we deploy on US hyperscalers?

Math - vector calculus, matrices; Artificial neural networks (should be included in technical proficiency but bears repeating)

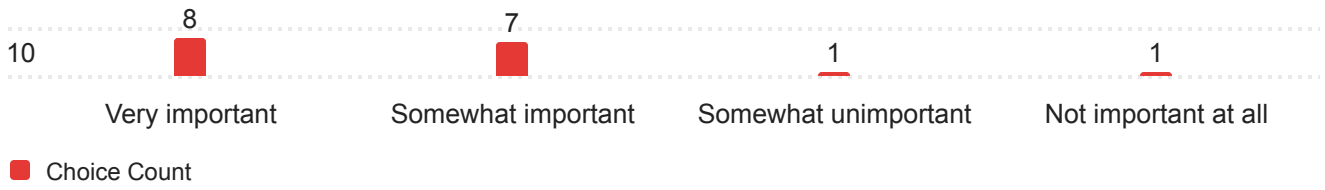
Passion, we look for people that have a passion for the job.

As we sell infrastructure and have no need for data scientists its hard to answer these questions. I answered them as what I believe is true from my customers.

you have covered them all in above.

deep understanding of relevant mathematics, logic and algorithm design. Today's graduates are severely lacking in basic logical edge case design

Q22 - How important is interdisciplinary knowledge (e.g., legal/regulatory, ethical, managerial, domain-specific) for AI professionals in your organization?



Q23 - If applicable, which interdisciplinary areas do you find most relevant (e.g., healthcare, finance, law, operations, product management) (Optional)

13 Responses

If applicable, which interdisciplinary areas do you find most relevant (e.g., healthcare, finance, law, operations, product management) (Optional)

Product and project management skills are quite valuable.

Product management, operations and life cycle management.

infrastructure management

Mechanical engneering & robotics engineering, healthcare

quality management in advanced manufacturing

market intelligence

A basic understanding of PII and data privacy is always a plus. Project management is hugely helpful: a basic understanding of work packages, level of effort estimates, critical path, GANTT charts, etc.

Healthcare, medicine

Operations, project management, industry exposure.

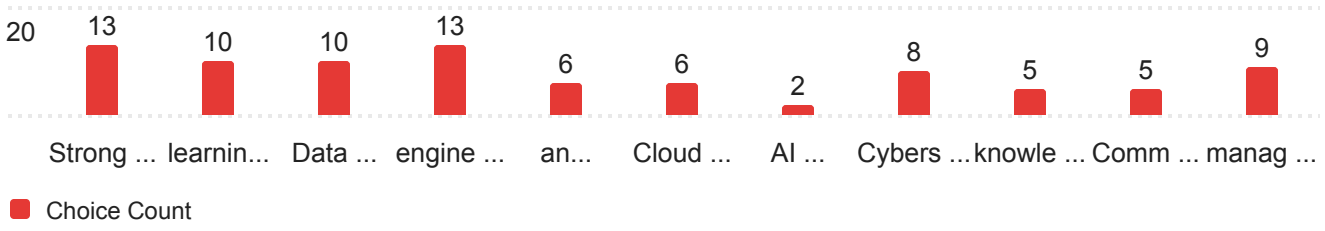
For success in delivering AI solution's it is imperative to have an understanding of how to decide on what projects to accept, to articulate the value of a given project in concrete numbers (improve the model by x% = a savings of xx$), this way the project can be measured against the expected benefits in order to state it was successful or not.

telecom, defence, industrial

Standards/regulatory

product management, operations

Q24 - For entry-level AI roles, which of the following are most important? (Select up to 5.)



Q25 - Based on your experience, which technical topics or areas should be emphasized in our AI programs to prepare students for the evolving AI workforce? (Optional)

12 Responses

Based on your experience, which technical topics or areas should be emphasized in our AI programs to prepare students for the evolving AI workforce? (Optional)

Good understanding of AI workflows from model to silicon (for computer engineering).

Limits of AI systems and how to measure their performance metrics.

One of the strongest element to be aware of is the trend for the code output to be commoditized. Students need strong coding fluency (to review code output), but even more important they will need to write comprehensive specs.

Neural network accelerators. Transforming neural nets to edge systems. Telecommunication and effects on AI solutions. Model quantization and pruning.

AI Best Practices, real world case studies

embedded AI / EdgeAI

Cloud computing basics: elastic compute, types of storage, instances using GPUs, tools such as Google Vertex AI, AWS Bedrock, etc.

Trends in AL/ML are ephemeral but mathematics, artificial neural networks, and solid coding skills will always be employable. A solid foundation with excellent problem solving skills is far more valuable than someone who is up to date on the latest Llama or ChatGPT deployment and relies on vibe coding and Git lookup to do their homework.
Teach students to read research papers. Cutting edge AI/ML research is released weekly and competitive employees will need to read the latest developments from academic sources if they want to drive the cutting edge. If you find out the latest in AI from a newspaper, you are already more than 18 months behind the product development of leading companies. Learning how to teach yourself new skills and committing yourself to keeping up to date in a rapidly evolving field is crucial for success. You aren't done learning when you get your degree.

Understand that AI is not a standalone study and is just a subset of a projects overall deliverable.

Be able to articulate a measurable success criteria and measure the outcome and value of a project when delivered. When a project fails to document why it failed and what will be done to ensure the mistakes that were made will not be made again (ability to do a post mortem with action items). Success comes through failure - learn from failure. The more you fail the more you likely you are to succeed.

It should begin with solid foundations in probability, statistics, and optimization, then move on to core machine-learning and deep-learning concepts (supervised and unsupervised methods, CNNs, RNNs/Transformers). Practical skills are equally essential: building data-engineering pipelines, mastering MLOps (version control, containerization, CI/CD, model monitoring), leveraging cloud AI services, and practicing responsible-AI techniques such as explainability, fairness, and privacy. As a Concordia student aiming for a finance career, I also recommend adding industry-specific topics—time-series forecasting, anomaly/fraud detection, and risk modeling—so graduates can immediately apply AI to real business challenges.

fundamental engineering skills/understanding and especially mathematics and logical (as in if a then b) thinking and algorithm design. Things evolve hast so fundaments need to be strong. And only accept students that have a passion. Students who are only moderately interested/talented won't make it/get jobs.

python programming

agent, embodied ai.

Q26 - What types of projects or portfolio evidence (e.g., capstone projects, internships, open-source contributions) most influence your decision to hire entry-level AI graduates? (Optional)

11 Responses

What types of projects or portfolio evidence (e.g., capstone projects, internships, open-source contributions) most influence your decision to hire entry-level AI graduates? (Optional)

Generally capstone projects and open source contributions are highly valudable.

We prefer capstone projects and some industry experience.

internships

internships

Working with data collected specifically for a project (as opposed to using an existing dataset). The work involved in data collection is generally vastly underestimated. Model evaluation and an objective assessment of model performance and biases.

In an interview, we're going to sit you down and quiz you on your math skills, the theoretical basis of AI models, your code base in Java, Python, and your knowledge of the subject matter of the models that we are building. If you have a portfolio or internship, we will use that as a starting point for the discussion, so this type of program-mandated experience can be useful if it helps to hone your technical skillset and give you fodder to answer questions. The existence of mandatory projects and portfolio work isn’t useful in and of itself. I cannot tell you how many prospective post-doctoral candidates I have interviewed who are “First Author” on scientific papers who don’t know the first thing about them when questioned. As a team, we are far too skeptical to hire you based on anything less than an absolute technical grilling. Otherwise, we prioritize employment experience (even in unrelated fields, retail if fine!) or self-initiated projects over anything that is program-mandated.

Our drive to develop our own IP. We are a consulting firm, but we differentiate ourselves through IP. The development of that is the type of project we could use help with.

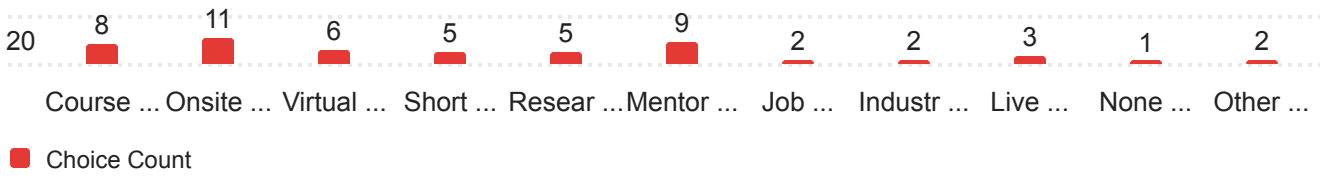
This does not apply to R2i - but for my customer's I believe it would be a student that worked at one of the superclusters (ScaleAI, NGEN...) on perhaps reviewing project intakes as well as reviewing the outcomes of project phases against what was expected. Experience DEVOPS, data cleansing and wrangling.

When evaluating entry-level AI candidates, I look for any concrete projects that clearly demonstrates problem-solving ability. It can be from anywhere (internship, classroom projects or personal)

Passion, intelligence, personality, strong logical thinking, being able to communicate their understanding

projects, open-source contributions

Q27 - What types of experiential or work-integrated learning opportunities could your organization provide to students in our BEng/BSc AI programs? (Select all that apply.) - Selected Choice



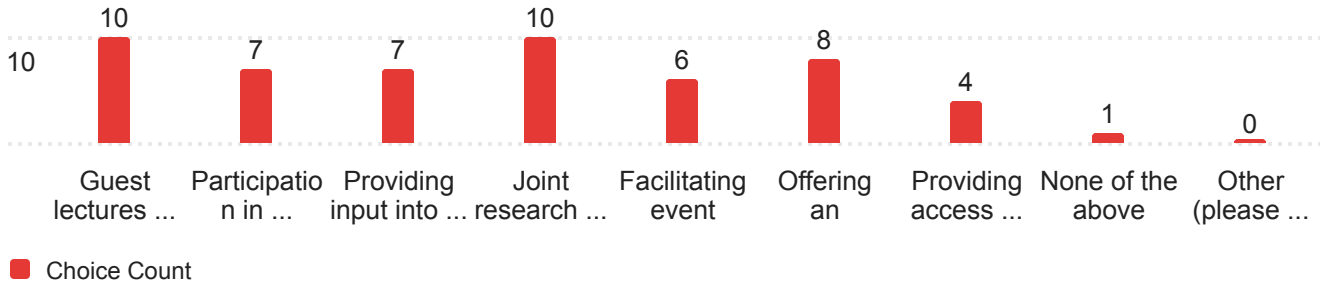
Q27_11_TEXT - Other (please specify): - Text

2 Responses

Other (please specify): - Text
Workshops on AI on the cloud
We sell HW and our cloud, so very little in direct AI

Q28 - In addition to experiential learning, what other forms of collaboration would your organization be interested in? (Select all that apply.) - Selected Choice

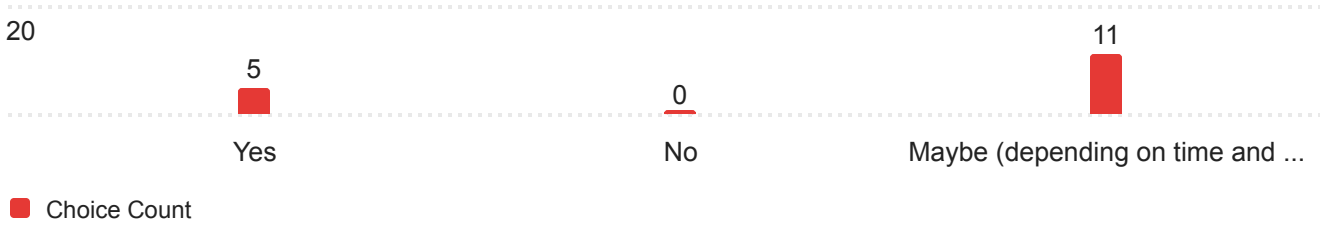
16 Responses



Q28_9_TEXT - Other (please specify): - Text

No data found - your filters may be too exclusive!

Q29 - Would your organization be interested in reviewing and providing feedback on a draft curriculum or selected course outlines in the future?



Q30 - What specific AI-related topics, threats, or challenges do you foresee becoming significant in the near future (e.g., AI safety, regulatory changes, workforce impact, AI impact on Society/environment)? (Optional)

11 Responses

What specific AI-related topics, threats, or challenges do you foresee becoming significant in the near future (e.g., AI safety, regulatory changes, workforce impact, AI impact on Society/environment)? (Optional)

Landscape is moving very fast and some self-learners gain a very strong advantage. It seems to me that code is becoming a commodity while specification and formal structuring of projects will be the valuable asset.

workforce only skills set

AI resouce availability (grid and network) and regulations (laws)

AI safety

Responsible use of AI, quality control of AI models, cost-efficient and environmentally friendly deployment of AI models (e.g., Edge AI), open weight/open source models to increase sovereignty.

Code longevity – QC to prevent code degradation in large systems over time, implementations over implementations covering bad code that can no longer be fixed
Environmental impact of data centers
AI/ML Ethics:
Racial, gender, sexuality, class systems bias
Privacy including surveillance, anonymity, data brokerage, Hawthorne effect
Medical ethics – predictive care models (insurance denial, denial of care), eugenics

Workforce impact. Differentiating ourselves from everyone else that says they are AI enabled.

Data sovereignty, compliance, security in an opensource world.

AI off the cloud. Secure use of AI to protect IP/state secrets, ... Workforce impact, especially for junior/intermediate developers who don't completely understand AI generated code/designs so can't do code/design reviews. And how will the get better when leaning on AI to produce instead of challenging their brains...

Standards and regulatory changes

AI safety

Q31 - Over the next 5–10 years, how do you anticipate the AI landscape will change, and what impact might this have on the skills and knowledge required of AI professionals? (Optional)

9 Responses

Over the next 5–10 years, how do you anticipate the AI landscape will change, and what impact might this have on the skills and knowledge required of AI professionals? (Optional)

Coding will become a commodity produced by LLM. Structuring requirements and good unit tests along with very tight specifications will be needed to guide LLMs to accomplish the code output.

Due to world models and image processing massive improvements, robots and edge devices will have a lot of growth. Agentic coding and tools will gain a strong foothold and it will be quite disruptive. However, sound judgement, critical thinking skills, teamwork and communication skills will remain the most sought after skills. It will be critical that students master the fundamentals quite well to understand the limitations of LLMs.

not easy! I would bet AI being used as a building block for more complex systems, and a common communication /data sharing framework will be created to allow this (conceptual example: every device have a connector for "AI data exchange")

It will strongly alter current practices/paradigms related to information management (technical and business) and use

It's really hard to predict that timeframe, but I think that the demand for this talent will only increase (e.g., Palantir's "Forward Deployed Engineer" role will be in demand by many more companies). I also think that fundamental skills in applied stats, probability and math will remain critically important. We don't understand what's exactly going on in many AI models, but understanding the difference between randomness and deterministic output is very important. How can we ensure a certain quality target if the outputs are random? Even more importantly, how can we explain this to our clients? My expectation of an "AI expert" is to be able to clearly articulate the trade-offs and the expected links between cost, performance, latency, usability and other design considerations.

The public’s attention has most recently been drawn to generative AI, but it’s hardly the most transformative or dangerous implementation of AI/ML possible. Increasingly autonomous logistics and robotics systems in the transportation, manufacturing, and energy sectors, increased data collection and aggregation in medicine and our personal lives, and our increasing reliance on cloud services and connection means that more and more of the infrastructure that underpins our daily existence is being automated and handed off to AI/ML systems. Professionals in this field need training in ethics, not just for use case but also for the consequences of degraded and damaged software. Over the next 5-10 years, I anticipate that professionals will do as much damage control for the poorly built ML systems of today’s vibe coding epidemic, as creation of new systems. We need to train highly skilled problem solvers, not code monkeys who write bits and pieces of code without considering the consequences of poor quality or lack of integration down the line, when the agglomeration of code layers becomes an irreversible problem.

I think it will become like all landscapes before it...just part of the overall landscape and not the dominant force that it is today.

We are seeing pressure and the ability to source; components, floor space, electricity to the hungry nature of AI. We will need to see improvements in supply chain and improvement in efficiencies in order to feed he AI beast.

Only the strongest, smartest SW developers will have jobs. They architect and prompt and evaluate the output from complex AI event systems. This is a 2-3 year horizon. Not 5-10

Manage AI agents

Q32 - Please share any additional comments, suggestions, or concerns regarding our proposed AI programs (BEng and BSc), including anything you feel is missing or could be improved. (Optional)

5 Responses

Please share any additional comments, suggestions, or concerns regarding our proposed AI programs (BEng and BSc), including anything you feel is missing or could be improved. (Optional)

Its a good thing that the programs be revisited in depth because they could risk becoming quite quickly out of alignment with the market needs.

This is a wonderful and timely initiative. I'm a Concordia grad, and I had the pleasure of working with many Concordia students in the past. These programs can be a global success and help close the gap between Canada's leadership in AI theory and our lagging performance in applications.

I hope you encourage your students to think deeply about the problems they want to solve with AI. I know teaching undergrads isn't easy, but it's an area where we will rely heavily on the personal responsibility of the next generation of skilled professionals.

Students will need the ability to translate business need in terms of what is possible with AI. How to create MVPs including testing of the data pipeline and data quality.

Be sure to put the bar very high when admitting students or you will be doing them a great disservice. They will have student debt without the chance of ever landing a job.

Undergraduate student interest survey questionnaire

BEng / BSc AI Student Survey



The Gina Cody School of Engineering and Computer Science is exploring **two new undergraduate programs in Artificial Intelligence**:

- **Bachelor of Engineering (BEng) in Artificial Intelligence Engineering**
- **Bachelor of Science (BSc) in Artificial Intelligence**

We are asking current Concordia students for feedback on how interesting these programs would be and what features matter most to them.

The survey takes about **5-10 minutes** to complete and will close on **March 27, 2026**. Your responses are confidential and will only be used in aggregate to help shape future programs.

Thank you for your time and feedback.

Warm regards,

Dr. Ait Mohamed
Associate Dean, Academic Programs
Gina Cody School of Engineering and Computer Science
Concordia University

Q2

What program are you currently enrolled in?

- ○ BCompSc – Computer Science
- ○ BEng – Aerospace Engineering
- ○ BEng – Building Engineering
- ○ BEng – Chemical Engineering
- ○ BEng – Civil Engineering
- ○ BEng – Computer Engineering
- ○ BEng – Electrical Engineering
- ○ BEng – Industrial Engineering
- ○ BEng – Mechanical Engineering
- ○ BEng – Software Engineering
- ○ Other (please specify):

Q3

What is your current year of study?

- ○ 1st year
- ○ 2nd year
- ○ 3rd year
- ○ 4th year or above
- ○ Other (please specify):

Q4

How interested are you in AI-related topics (e.g., machine learning, data, robotics, AI software)?

- ○ Very interested
- ○ Somewhat interested
- ○ Neutral
- ○ Not very interested
- ○ Not at all interested

Q5

We are considering **two new AI programs** at Concordia:

1. Bachelor of Engineering (BEng) in Artificial Intelligence Engineering

- A **four-year engineering degree**
- Focused on **building real AI systems**, combining:
  - AI software and algorithms
  - Data and cloud infrastructure for AI
  - Hardware, embedded systems, and robotics using AI
- Includes strong **math and engineering foundations**, engineering science, and team design projects
- Leads toward **engineering-type roles** that design, build, and deploy AI systems in the real world (e.g., AI engineer, ML engineer, AI systems engineer, AI developer in robotics or autonomous systems).

2. Bachelor of Science (BSc) in Artificial Intelligence

- A **three-year science degree (90 credits)**
- Focused on **algorithms, data, and software for AI**
- Fewer engineering core courses (less emphasis on hardware, engineering design projects, and some engineering math)
- More room for **AI, computer science, and general electives**
- Leads toward more **software and data-focused roles** (e.g., ML developer, data scientist, AI software developer, AI analyst).

Both programs:

- Share a strong **AI core** (machine learning, deep learning, data analytics, AI systems)
- Include content on **ethics, safety, security, fairness, and explainability** in AI
- Offer **hands-on projects** and opportunities to work with real data and tools.

Q6 ✶

Based on this description, how likely is it that you would apply to the **BEng** in Artificial Intelligence Engineering if it became available today (assuming you were at the stage of choosing a program)?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q7 ✶

If the **BEng** in Artificial Intelligence Engineering had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q8

How likely is it that you would apply to the **BSc** in Artificial Intelligence if it became available today (assuming you were at the stage of choosing a program)?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q9

If the **BSc** in Artificial Intelligence had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q10

How relevant do these proposed AI programs feel to your academic and career goals?

- ○ Very relevant
- ○ Somewhat relevant
- ○ Not very relevant
- ○ Not relevant at all
- ○ Don't know

Q11

Display this question

If How relevant do these proposed AI programs feel to your academic and career goals? Not relevant at all Is Selected

Or How relevant do these proposed AI programs feel to your academic and career goals? Don't know Is Selected

If you responded, "Not very relevant", "Not relevant at all" or "Don't know", please briefly explain why.

Q12

Which of the following **course areas** are most interesting to you? (Select up to 5.)

- ☐ Machine learning and deep learning
- ☐ Generative AI and large language models
- ☐ Reinforcement learning and agents
- ☐ Data analytics and data engineering
- ☐ AI + robotics / autonomous systems
- ☐ Edge AI and embedded/real-time AI systems
- ☐ Cloud AI and distributed ML
- ☐ Trustworthy, safe, and fair AI
- ☐ AI security and AI for cybersecurity
- ☐ Advanced AI theory and algorithms
- ☐ AI for specific domains (e.g., healthcare, energy, telecom)
- ☐ None of the above

Q13

How important are the following features in an AI-related program for you?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Co-op or paid internships in AI-related roles	○	○	○	○	○
Hands-on labs and projects using real datasets and tools	○	○	○	○	○
Industry-sponsored capstone projects	○	○	○	○	○
Opportunities for undergraduate research in AI	○	○	○	○	○
Courses on ethics, law, and societal impacts of AI	○	○	○	○	○
Access to GPUs / cloud resources for AI projects	○	○	○	○	○

Q14

In what ways could an AI program be made more attractive to students like you? (Select all that apply.)

- ☐ Co-op option available
- ☐ Mandatory co-op included in the program
- ☐ More hands-on training and projects
- ☐ Clear specializations (e.g., AI + Robotics, AI + Cybersecurity, AI + Healthcare)
- ☐ Flexible electives that can be tailored to interests
- ☐ Opportunities to work directly with companies on AI projects
- ☐ Other (please specify):

Q14

In addition to the BEng and BSc in AI, we will be offering a **Minor in Artificial Intelligence** that could be added to many existing degrees.

Q15

If a 25-credit Minor in Artificial Intelligence were available and compatible with your program, how likely is it that you would consider completing it?

- ○ Very likely
- ○ Somewhat likely
- ○ Neither likely nor unlikely
- ○ Somewhat unlikely
- ○ Very unlikely

Q18

Looking at your own situation, which of the following would be most appealing to you? (Select one.)

- ○ A full BEng in Artificial Intelligence Engineering
- ○ A full BSc in Artificial Intelligence
- ○ A Minor in AI added to my current program
- ○ More AI-focused electives within my current program (no new credential)
- ○ None of the above

Q19

What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?

Q20

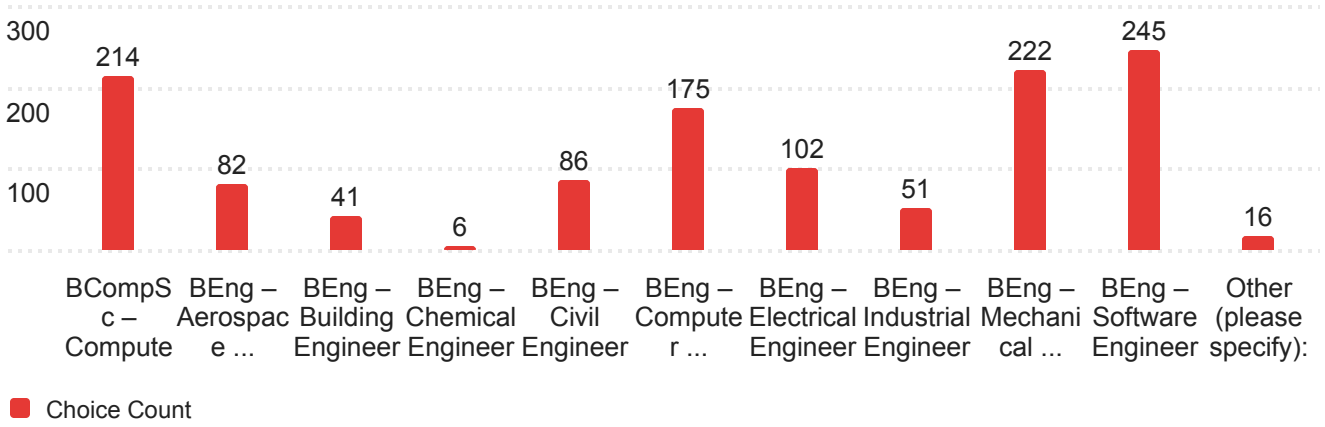
What is the main reason you would **not** consider an AI-focused program?

Q21

Any final comments or suggestions about the proposed AI Engineering or AI programs?

Q2 - What program are you currently enrolled in? - Selected Choice

1240 Responses



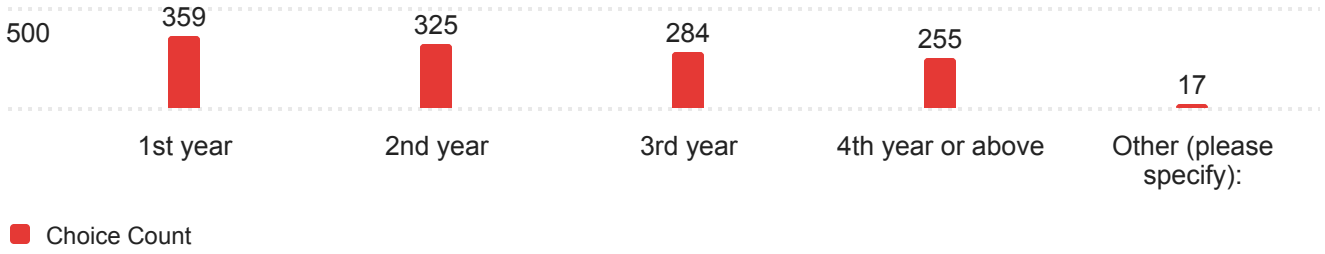
Q2_11_TEXT - Other (please specify): - Text

14 Responses

Other (please specify): - Text
Data Science
BCompsc - Computer Science and Computation Arts
BCompSc Computer Science, Joint Major in Data Science
Computer science and data science
BCompSc - Data Science
BCompSc - Joint major in computation arts and computer science
BCompSc - Health and Life Sciences
BcompSc Data Science
BcompSc Health Life Sciences
BCompSc - Joint Major in Data Science
Compsci Data Science
BCompsSc - Data Science
B.CompSci - Health and Life Sciences
BCompSci - Data Science

Q3 - What is your current year of study? - Selected Choice

1240 Responses

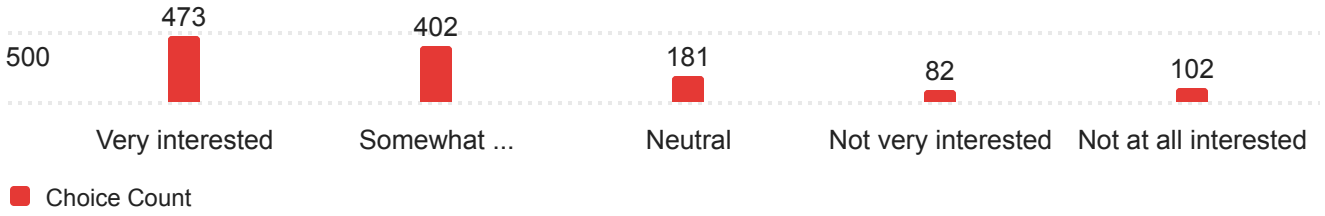


Q3_5_TEXT - Other (please specify): - Text

Other (please specify): - Text
prerequisites
5th
Part time
ECP year
6th year (part time)
Mature student program (extra classes year)
ECP
Year 0 (prerequisites)
5
year 0
5
5th
Been taking classes part time. I am somewhere between 1-2 year
Doing prerequisites
5

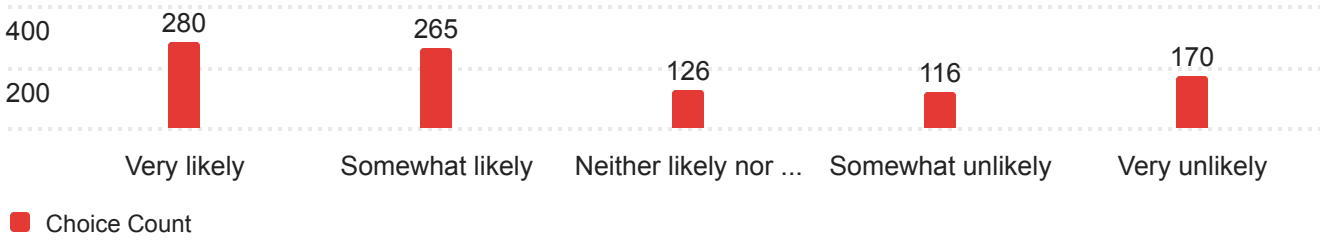
Q4 - How interested are you in AI-related topics (e.g., machine learning, data, robotics, AI software)?

1240 Responses



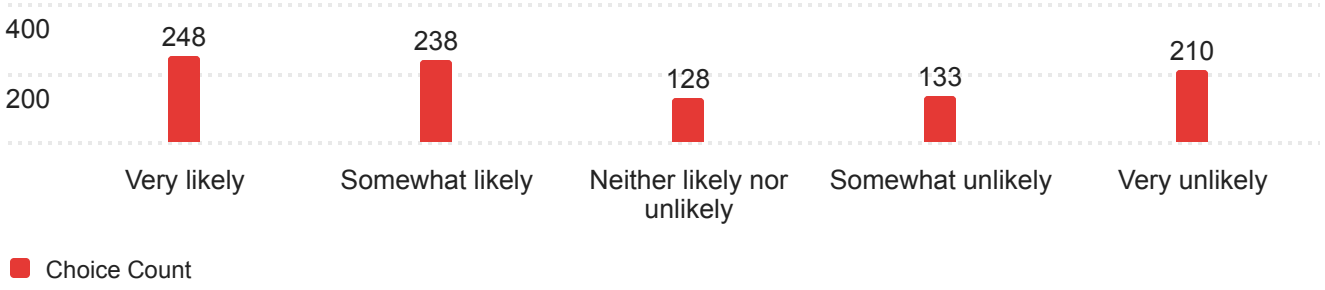
Q6 - Based on this description, how likely is it that you would apply to the BEng in Artificial Intelligence Engineering if it became available today (assuming you were at the stage of choosing a program)?

957 Responses



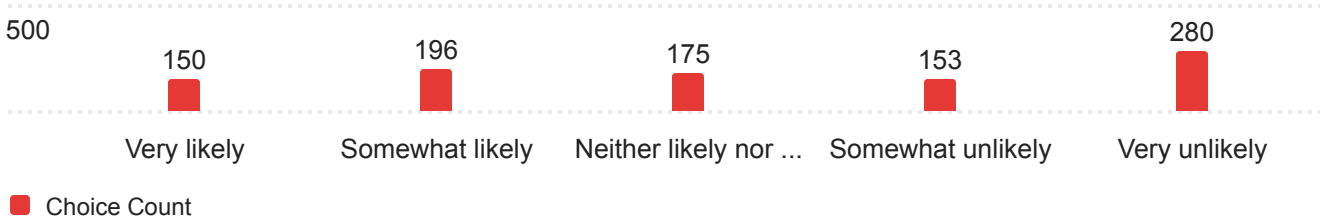
Q7 - If the BEng in Artificial Intelligence Engineering had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

957 Responses



Q8 - How likely is it that you would apply to the BSc in Artificial Intelligence if it became available today (assuming you were at the stage of choosing a program)?

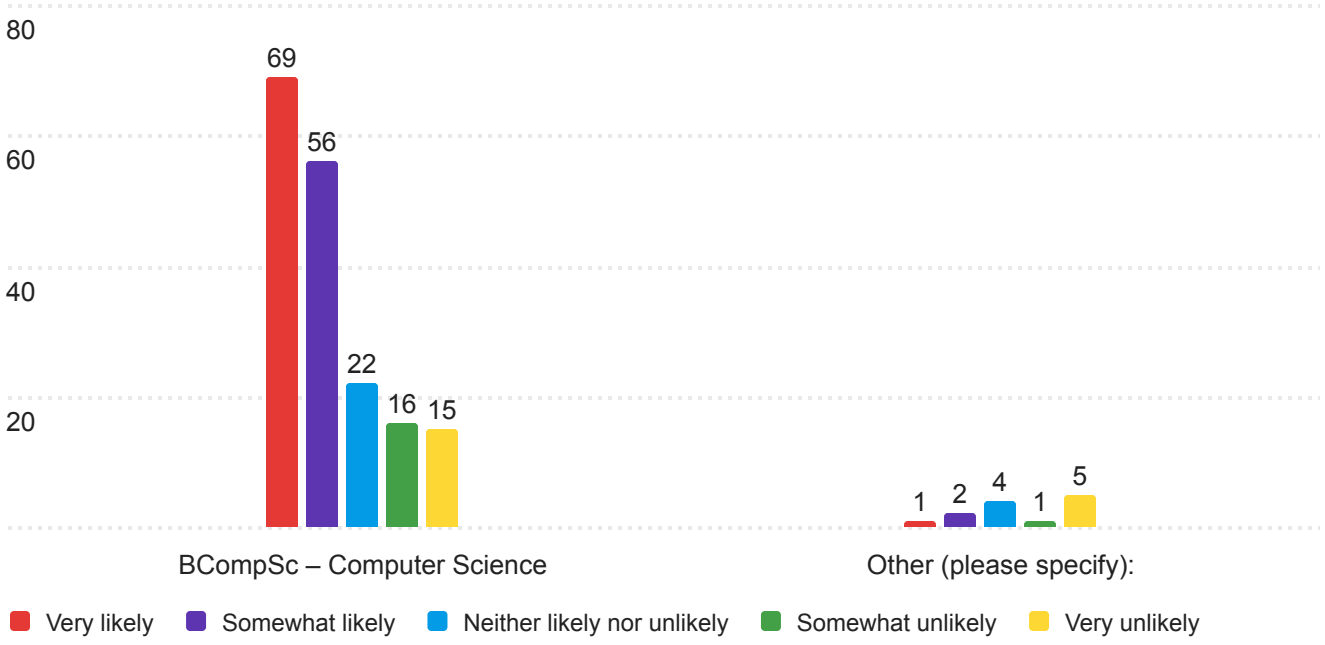
954 Responses



Responses to Q8 from students enrolled in BComp Sc programs, excluding those from engineering students:

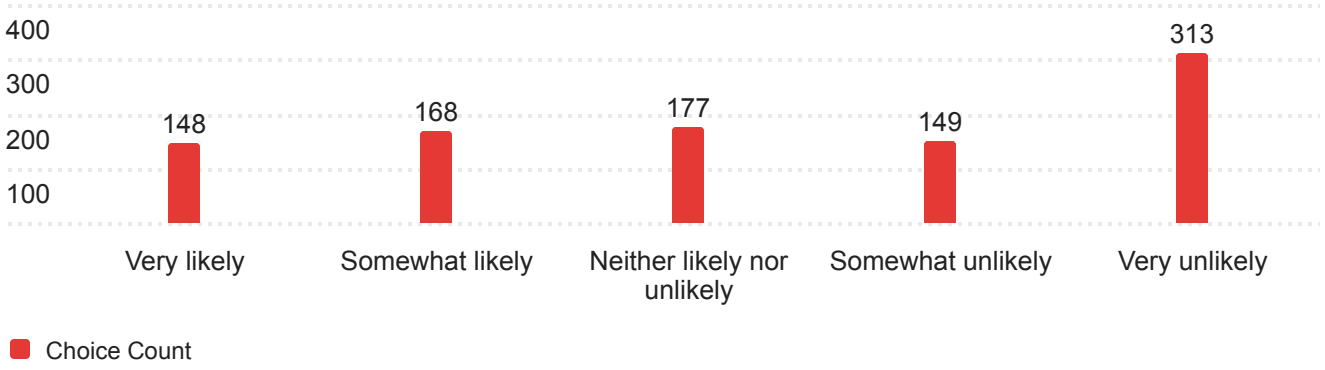
Q8 - How likely is it that you would apply to the BSc in Artificial Intelligence if it became available today (assuming you were at the stage of choosing a program)?

954 Responses



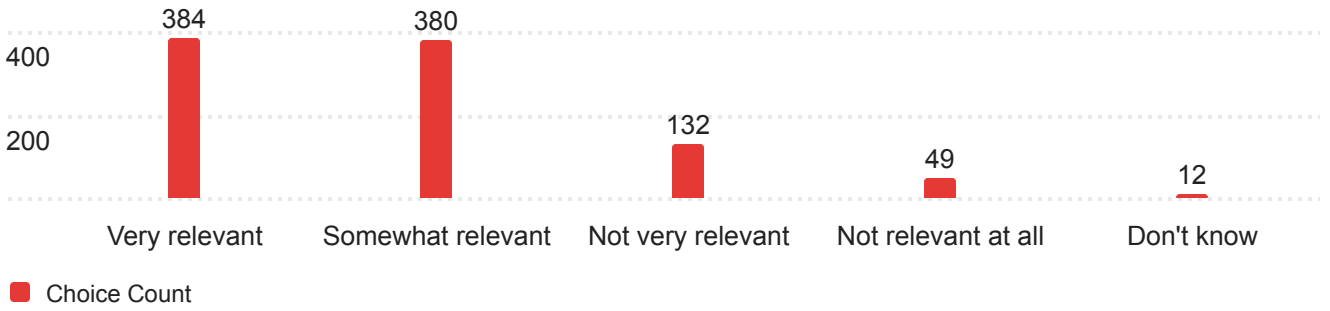
Q9 - If the BSc in Artificial Intelligence had been available at the time you applied to Concordia, how likely is it that you would have chosen it instead of your current program?

955 Responses



Q10 - How relevant do these proposed AI programs feel to your academic and career goals?

957 Responses



Q11 - If you responded, "Not very relevant", "Not relevant at all" or "Don't know", please briefly explain why.

39 Responses

If you responded, "Not very relevant", "Not relevant at all" or "Don't know", please briefly explain why.
I want to make stuff, not have AI make stuff for me
Proposed AI programs are completely unrelated to my current future goals
I don’t really support the Ai movement so I guess I would rather choose a program that doesn’t go against my beliefs
It does not need a dedicated degree a master would be enough
Because who’s gonna hire someone who studied ai
AI can be integrated in building engineering but it isn’t a system that we can depend on, or have a full field of study (university degree) in it yet, it needs many years to be tested and developed until we can offer it to the general public. As AI will continually evolve and so its fundamentals, which will then trigger a need to change the program again to fit.
I personally am not very interested in computer science and programming, so these topics aren't relevant to my current goals
Just have artificial intelligence courses in computer science or software engineering or computer engineering
I just dont know
Learning to develop, and deploy LLMs isn’t a career path that am interested in, as I prefer more of the physical aspects, and hands on creativity mechanical engineering offers. Learning how to effectively use AI in mechanical engineering would be interesting to learn.

As I am studying Civil Engineering, I don't quite understand how nor how much Ai we would use in our field. Apart from writing some form of code on MATLAB and such or to generate floor plans on CAD softwares, I'm not sure how it would apply. Never the less, it still peaks my interest a little, but I would of preffered to keep the old options for specializations.

I feel as though artificial intelligence is too niche of a program. It is a specialization on what instead should be electives. Instead, it should be offered as Comp. Eng w specialization.

I want to go to law school and focus on tech regulation

I plan on becoming a Game Developer, and AI usage is very looked down by the community.

I have little interest in computer software or engineering so these courses do not apply to me very well. In addition I would be more interested in a much more ethics focused course on how to deliver/design artificial intelligence that can be of high quality and productive use as this seems to be a core issue facing AI today that will not be addressed with more engineers but more critical thinkers.

Artificial Intelligence is something that can be explored no matter your engineering discipline. I believe that it is redundant to have an entire program dedicated to it. Having courses around machine learning and algorithms would make sense but not dedicating an entire program. Also from a career perspective as a student going into the job market it is already difficult to find suitable employment with core engineering degrees, I believe having an engineering degree in AI would be less valuable for a student and would make it increasingly difficult to find employment. It is too specific.

i hate ai and think it’s making everyone dumber

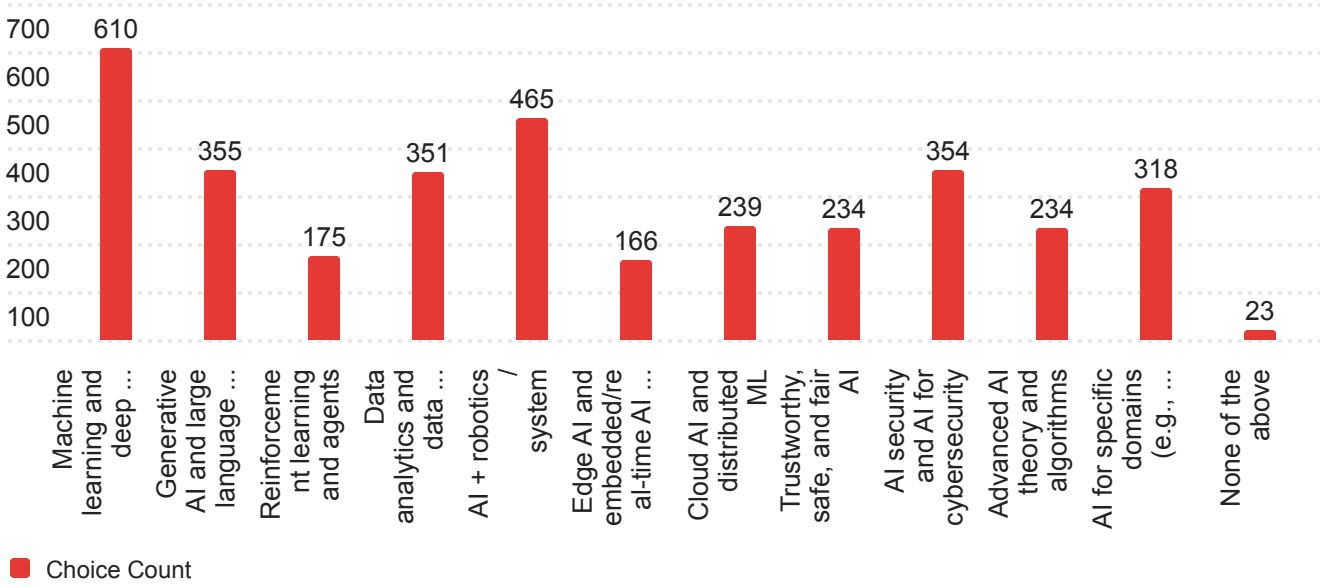
I don’t need advanced machine learning and AI in construction systems industry. That doesn’t mean it’s a bad program or idea it’s just not for me. I think for people interested in that why not go into something broad like software or computer engi.

Don’t give rings to “AI engineers” this is an extension of software. Adjust the software program

illegitimate engineering field. we should not be promoting the use of AI.

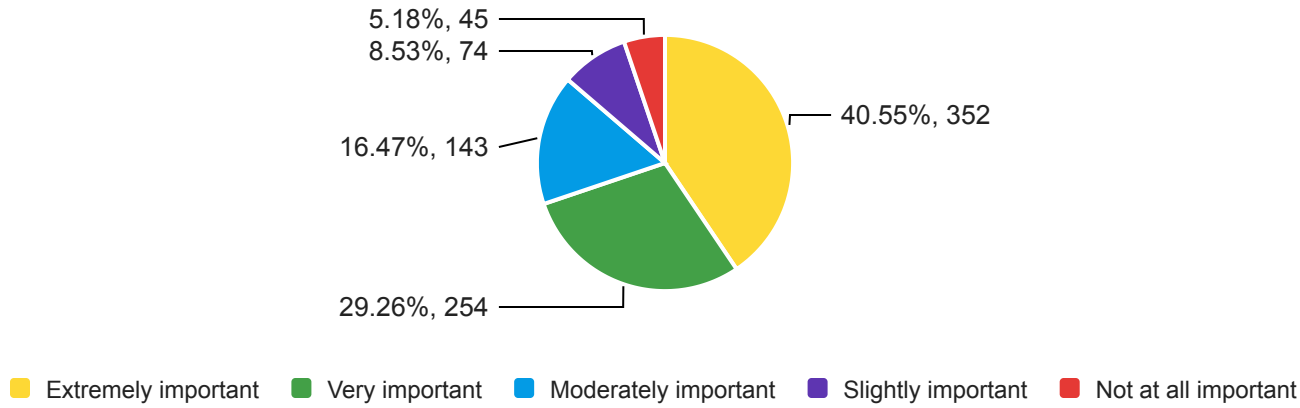
Q12 - Which of the following course areas are most interesting to you? (Select up to 5.)

868 Responses



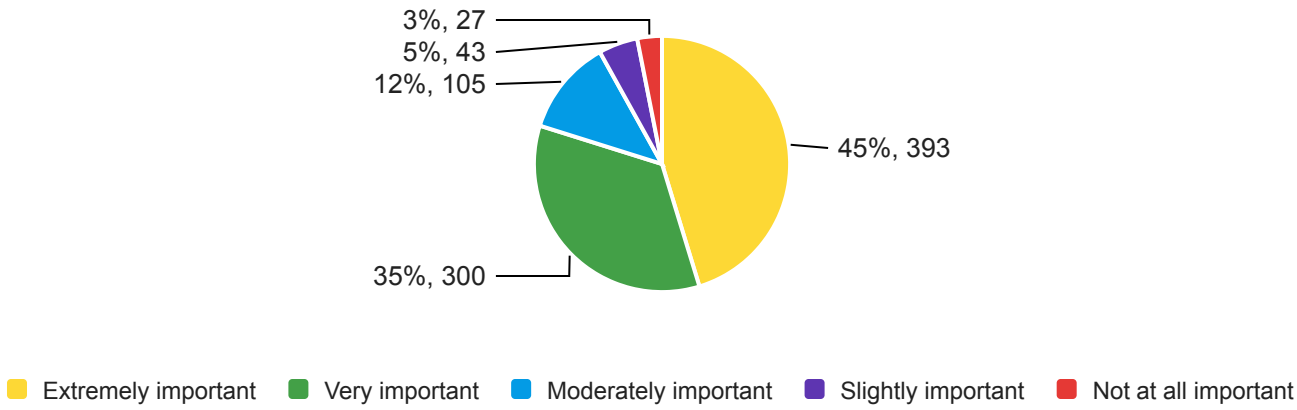
Q13_1 - Co-op or paid internships in AI-related roles

868 Responses



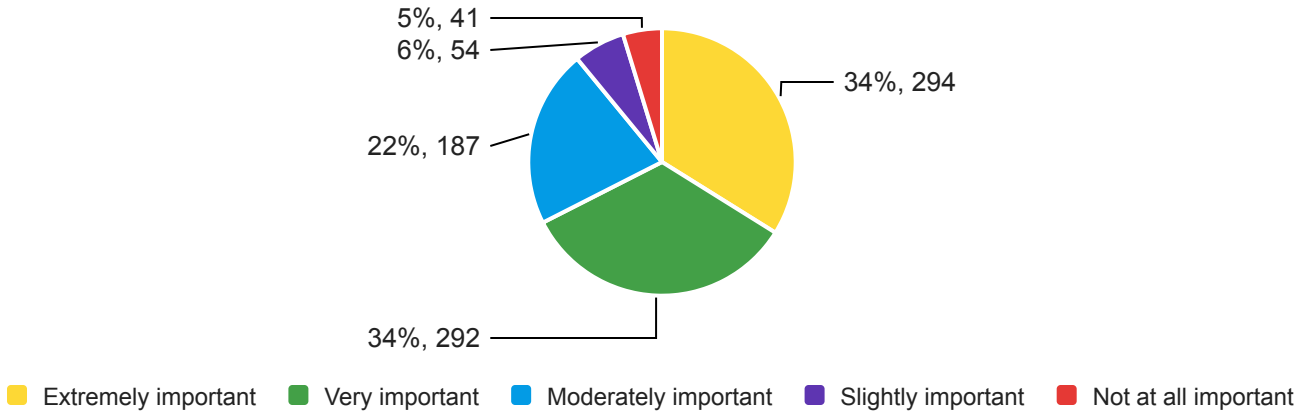
Q13_2 - Hands-on labs and projects using real datasets and tools

868 Responses



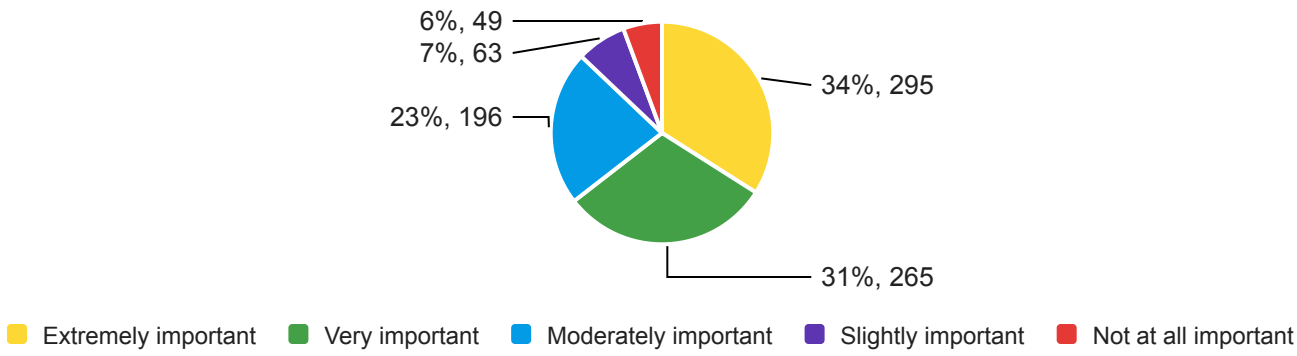
Q13_3 - Industry-sponsored capstone projects

868 Responses



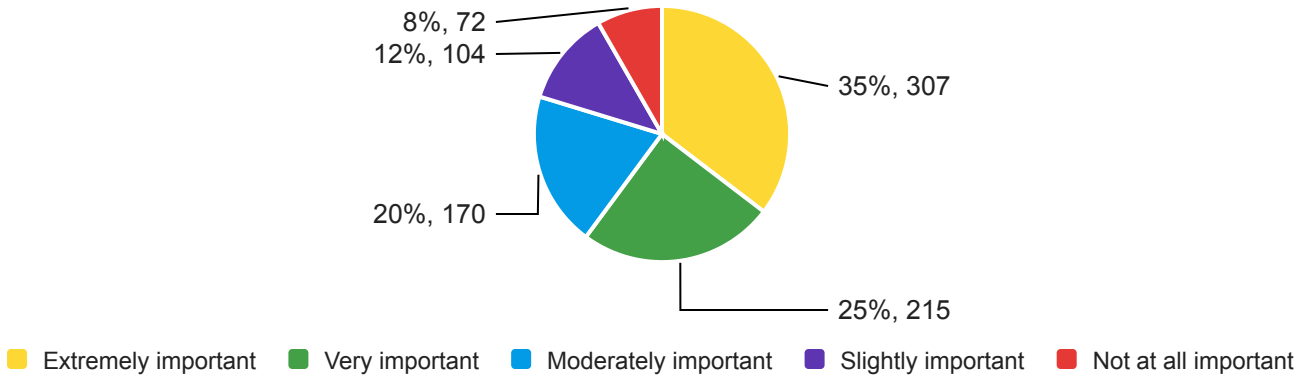
Q13_4 - Opportunities for undergraduate research in AI

868 Responses



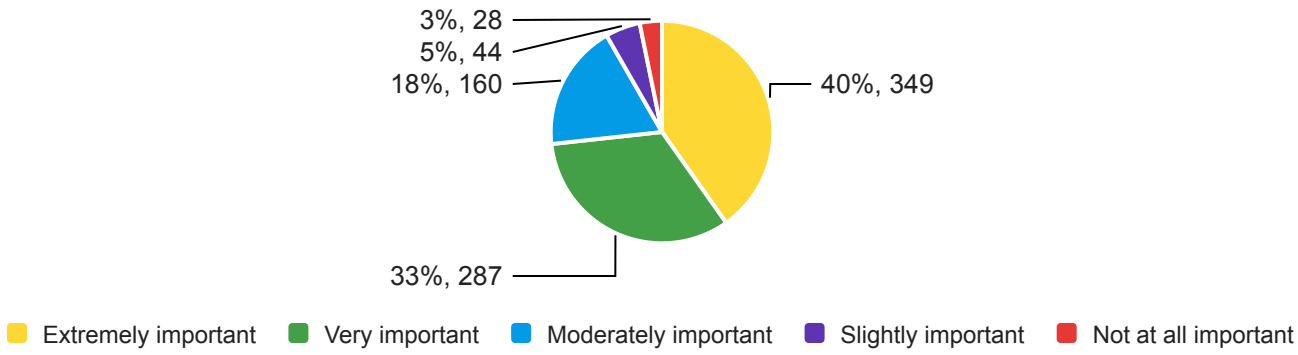
Q13_5 - Courses on ethics, law, and societal impacts of AI

868 Responses



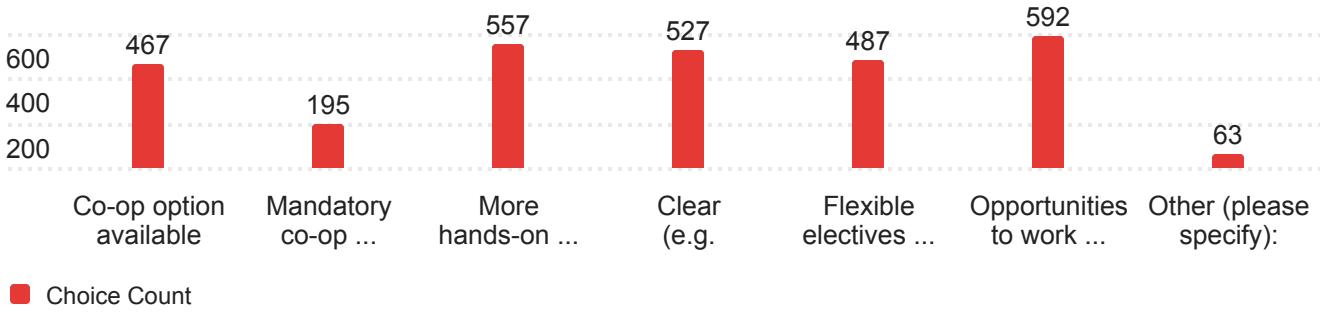
Q13_6 - Access to GPUs / cloud resources for AI projects

868 Responses



Q14 - In what ways could an AI program be made more attractive to students like you? (Select all that apply.) - Selected Choice

868 Responses



Q14_7_TEXT - Other (please specify): - Text

56 Responses

Other (please specify): - Text
Technical electives
I dont know if this works but it the hurtful effects of AI on people and the environement need to be clearly laid out. That way students who dont want to be part of that can opt out or those who stay can try and change things.
It should be a Minor, not a Bachelor, so let's say you complete your Bachelor's degree and then decide to complete a minor in AI
not interested in AI
I wouldn’t focus on an “ai as itself” program but rather a subdivision of ai disciplines. I.e. ai development in robotics or data analysis. I feel like AI in itself is such a broad topic even compared to mech or soft that you wouldn’t get real value from it. Real value would come from specific application learning.
I wish there were an option to tweak the software engineering course with the option to take AI related courses
Prompting: whether it be a stand-alone course or a chapter in a course, prompting is crucial to understanding how to use LLMs in real-world applications.
More emphasis on software constructs, I believe the ENG version is lacking in the software building blocks that form vital components of AI
A clear focus on the ethical aspects of making an AI tool
fair use of intellectual and artistic property, ethics of generative AI, designing power and water efficient AI for sustainability.
work on relevant projects early on, understand the bridge between the heavy math courses and projects early on

none of the above

How is this course different from computer engineering or software engineering or data science degree ?

Intercourse such as AI music

Talking Less about AI

technical electives

A larger focus on long term planning and how to think critically to develop fair systems

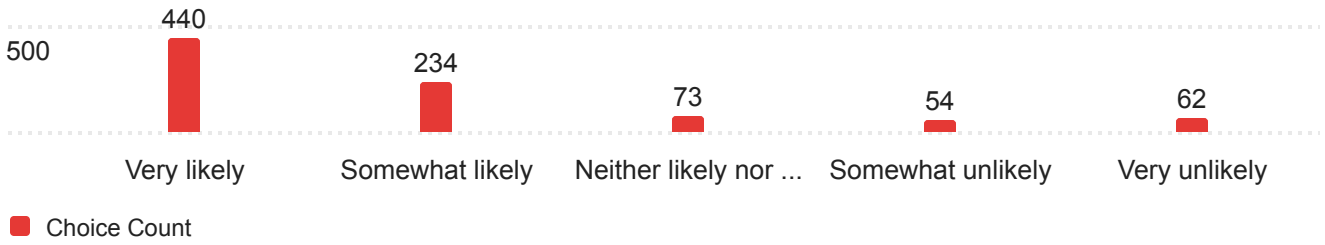
don’t.

Add software engineering courses

None, AI programs could not be attractive to students like me who understand the extreme environment harms of AI and the fact that Concordia is even considering adding these program is harmful and a disgrace to all those working hard to achieve their iron ring.

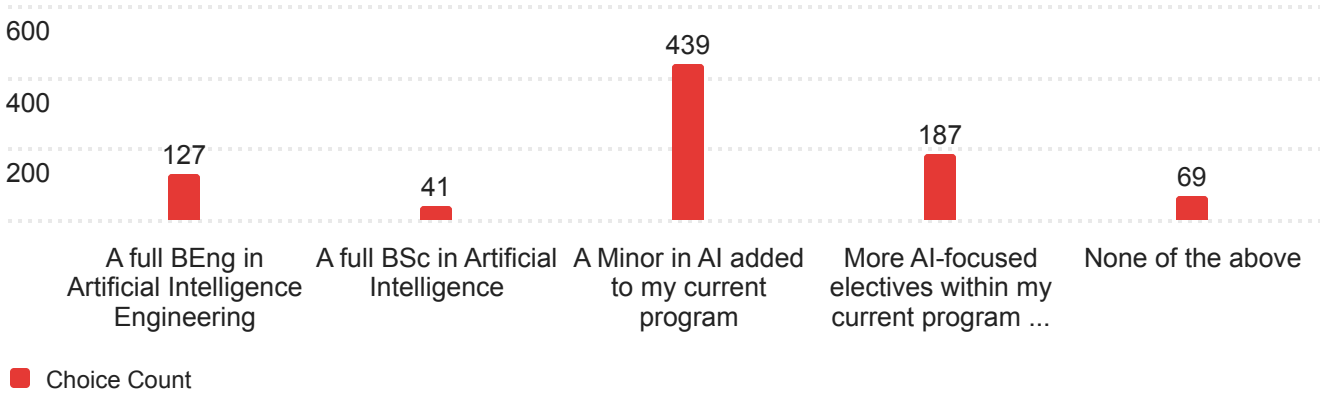
Q15 - If a 25-credit Minor in Artificial Intelligence were available and compatible with your program, how likely is it that you would consider completing it?

863 Responses



Q18 - Looking at your own situation, which of the following would be most appealing to you? (Select one.)

863 Responses



Q19 - What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?

605 Responses

What is the main reason you would consider an AI-focused program (BEng, BSc, or Minor)?
Because AI is advancing
AI is the future for a lot of companies and a lot of jobs, so knowing about AI and being able to combine it to different areas in my projects or my future jobs, could have a big impact for my qualities.
World is moving toward AI

AI still stays in the domain of computer science, but is more focused on one subject; BCS is currently pretty vague, which can be good if you're not sure, but you don't get specialized in anything

This is where the future is heading. I find many of the current classes and even some of the ai classes to be outdated or useless.

I love learning and I did my internship with a ml and big datasets

To be ahead of the curve and be more specialized in a field that is currently up and coming in hopes it says that way in 4-5 years

Good thing to learn and understand entering the job market nowadays

Demand of Ai in the world

AI is the future and many software engineering concepts being taught are outdated

to follow current market trends and be up to date

Ai is the future it is being used in every industry

I believe that AI at least in it's current phase is not great for people or the environement, especially data centers. So if I were to enter a BEng in AI I would do it in an effort to make AI into a part of society that doesent harm other parts.

Very interested and related to my actual program

I wouldnt choose an AI focused program

It would future-proof my degree.

I have an interest in AI

N/A

to keep up the trend with the industry and where it is heading

Q20 - What is the main reason you would not consider an AI-focused program?

570 Responses

What is the main reason you would not consider an AI-focused program?
Seems like it requires learning a lot of programming
Probably the complex, unknown and hard programming basis
Don’t like coding
If it does not differ much from taking CS with AI electives; if the only thing in AI-focused program is that all AI electives offered in CS are mandatory, there isn't much advantages
Depends on the professors and classes offered. If the material is relevant or not.
It is really specialized and I think that a topic you should get access after the basics of technology. And the uncertainty of that job area is really strong I think a masters is better for that since the people that would go in already would have the basics to go to other software jobs
The way Ai is being presented and forced down our throats gives the impression that it is a very temporary interest in the product
Extra time when I’m already close to graduating
None
I'm worried the reasoning taught by learning traditional programming languages in a SOEN program would be lost, which would negatively impact the understanding of core system problems.
no reason
I dont like AI in it's current form.
Lack of opportunities
Im not interested that much in it
There isn't. I would take if I had the opportunity.
Too specific
I don’t want an AI focused program
N/A - i think at AI course should be taken, minimum 2 - 3
Its too domain specific (compared to general software engineering)

I wonder if LLMs and the overall current state of AI will begin to plateau, leading to a decrease of popularity for the next few years until the next big innovation in this field.

Q21 - Any final comments or suggestions about the proposed AI Engineering or AI programs?

348 Responses

Any final comments or suggestions about the proposed AI Engineering or AI programs?

I think the program is best suited for as an optional elective

It could be nice to have one class "maybe like an introduction" to be able to know what we could learn and also see the possibilities during our BEng, like that probably for a major someone could specify in AI engineering

Not exactly sure what the difference is between these AI engineering programs compared to Software engineering. Could they be incorporated into software engineering instead of creating completely new programs?

Ya, don't have profs teaching stuff about AI that was relevant in 2010. Make most of the course tailored to what is actually happening NOW. Some of the 400 ai classes I have taken are a joke.

It should be a masters more than anything.

Sounds like a great idea!

If I can do double majors, it would be great, in this way I'll be able to finish my aerospace engineering along with Ai engineering

This is a fantastic initiative. I think there should be a significant focus on using modern, industry-leading tools like Claude Code or ChatGPT to train passage from programmatic to free-form (prompts) in AI systems.

Much like engineers need to understand that their inventions and policies will affect people's lives AI engineers need to understand this even more because of the changing technological climate.

Keep me informed please !

I would appreciate it if making a new AI program in engineering wouldnt mean we compromise the options and technical electives for other programs such as civil engineering just to compensate and complete this new program at the cost of other students preplanned track

I think it is a good idea and should be implemented.

I love it, I wish I could take it

N/A

Make students valuable. We need a chance to survive in this world

Interesting

AI is not as good as people think because all the ideas are the same, and the market is saturated with many similar ideas in large amounts

as a computer Science student, I am really interested in AI-focused programs as minor and if they'll be available, I would definitely apply for it

no

I'm reassured that the university that I'm attending, thinks about thoughtfully adapting to the changes in our daily lives, and providing us students, courses that reflect relevant needs in our societies.

Gina Cody School of Engineering and Computer Science - Help develop our new AI program

Please take a few minutes to complete our survey and share your thoughts on what you want from an undergraduate program in AI.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

1. What is your current or most recent level of education?

- ◯ French CEGEP (Quebec)
- ◯ English CEGEP (Quebec)
- ◯ High school (Canada)
- ◯ High school (International)
- ◯ Other

2. Are you currently exploring multiple program options before making your final decision?

- ◯ Yes
- ◯ No

3. Have you researched undergraduate programs related to artificial intelligence (AI)?

- ◯ Yes
- ◯ No

4. On a scale from 1 to 5, how would you rate your current level of interest in AI? (1 = Not interested, 5 = Extremely interested)

   - ◯ 1
   - ◯ 2
   - ◯ 3
   - ◯ 4
   - ◯ 5

5. This proposed program would be offered as a Bachelor of Engineering (B.Eng.) in Artificial Intelligence Engineering and a B.Sc. in Artificial Intelligence. The B.Eng. focuses on designing and building AI enabled systems from an engineering perspective (e.g., software, hardware, robotics, data and infrastructure) and the B.Sc. focuses on algorithms, theory and software for AI rather than only studying AI concepts in other disciplines. If such an AI program were offered, how interested would you be in applying? (1 = Not at all interested, 5 = Extremely interested)

   - ◯ 1
   - ◯ 2
   - ◯ 3
   - ◯ 4
   - ◯ 5

6. When you think about studying AI, which type of program interests you most? (Choose all that apply.)

   - ◯ An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).

- ◯ A computer science program (B.Sc.) that focuses on algorithms, theory and software for AI.
- ◯ A business / management program that focuses on using AI in organizations.
- ◯ I am not sure / I need more information.

7. What factors would influence your decision to consider an Artificial Intelligence program or related programs at our university? (Select all that apply)

- ☐ Reputation of the program
- ☐ Availability of co-op program
- ☐ Location of the university
- ☐ Course offerings
- ☐ Faculty expertise
- ☐ Scholarships or financial aid
- ☐ Career opportunities in the field

- [ ] Other

8. Name (optional):

Enter your answer

9. Email (optional)

Enter your answer

10. Do you agree that we email you further information about the Artificial Intelligence program?

- ◯ Yes
- ◯ No

11. Do you have any additional comments or suggestions related to an AI program or other programs you are exploring?

Enter your answer

CEGEP Student Open House Survey Results

Respondent ID	What is your current or most recent level of education?	Are you currently exploring multiple program options for your post-secondary studies?	Have you researched undergraduate programs related to artificial intelligence (AI)?	On a scale from 1 to 5, how would you rate your current level of interest in AI? (1 = Not interested, 5 = Extremely interested)	This proposed program would be offered as a Bachelor of Engineering (B.Eng.) in Artificial Intelligence Engineering and a B.Sc. in Artificial Intelligence. The B.Eng. focuses on designing and building	When you think about studying AI, which type of program interests you most? (Choose all that apply.)	What factors would influence your decision to consider an Artificial Intelligence program or related programs at our university? (Select all that apply)	Do you have any additional comments or suggestions related to an AI program or other programs you are exploring?
1	English CEGEP (Quebec)	Yes	Yes	5			Reputation of the program;Availability of co-op program;Location of the university;Course offerings;Faculty expertise;Scholarships or financial aid;Career opportunities in the field	
2	French CEGEP (Quebec)	Yes	No	4			Availability of co-op program;Faculty expertise;Career opportunities in the field	
3	International Diploma	Yes	Yes	5			Reputation of the program;Availability of co-op program;Faculty expertise;Career opportunities in the field;Course offerings	
4	High school (Canada)	Yes	No	4			Career opportunities in the field	
5	French CEGEP (Quebec)	Yes	Yes	4			Course offerings;Career opportunities in the field;Scholarships or financial aid;Reputation of the program;Availability of co-op program	
7	English CEGEP (Quebec)	No	No	4			Availability of co-op program;Course offerings;Career opportunities in the field	
8	High school (International)	Yes	No	4	4	An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).	Availability of co-op program;Career opportunities in the field	Very exciting
9	English CEGEP (Quebec)	Yes	No	4	5	A computer science program (B.Sc.) that focuses on algorithms, theory and software for AI.;An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).	Availability of co-op program;Faculty expertise;Career opportunities in the field	
10	Bachelorsfinal year	Yes	Yes	4	1	I am not sure / I need more information.	Scholarships or financial aid	Quantum computing is emerging field and I guess that subject you should offer though and I want masters in this as I'm gonna complete my bachelor this year. Regards
11	English CEGEP (Quebec)	Yes	No	4	4	An engineering program (B.Eng.) that focuses on building and deploying AI systems in real world applications (e.g., robotics, smart devices, infrastructure).	Course offerings;Faculty expertise;Career opportunities in the field	
12	French CEGEP (Quebec)	No	Yes	4	2	A computer science program (B.Sc.) that focuses on algorithms, theory and software for AI.	Career opportunities in the field	

Job Posting Analytics

Lightcast Q3 2025 Data Set

March 2026

1455 Boulevard de Maisonneuve O

Parameters

Select Timeframe: Feb 2016 - Feb 2026

Posting Language: All Postings

Lightcast Occupations:

Results should include

Code	Description
231113	Data / Data Mining Analyst
231114	Data Scientist
231118	Analytics Manager
231120	Artificial Intelligence Engineer
231210	Data Engineer
231213	Database Architect
231510	Computer Systems Engineer / Architect
231514	Technology Consultant
231715	Software Developer / Engineer

Regions:

Code	Description
01	Canada

Advertised Salary: Include all postings regardless

Minimum Experience Required: Any

Education Level: Any

Job Type: Include Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search: "Artificial Intelligence" or "AI"

Posting Type: Active Postings

Job Postings Overview

15,508	1,862	2 : 1
Unique Postings	**Companies Posting**	**Posting Intensity**
31,346 Total Postings	419,633 Total Companies	Regional Average: 3 : 1

Advertised Salary

*There are **1,855** advertised salary observations (12% of the 15,508 matching postings).*

$54.58/hr

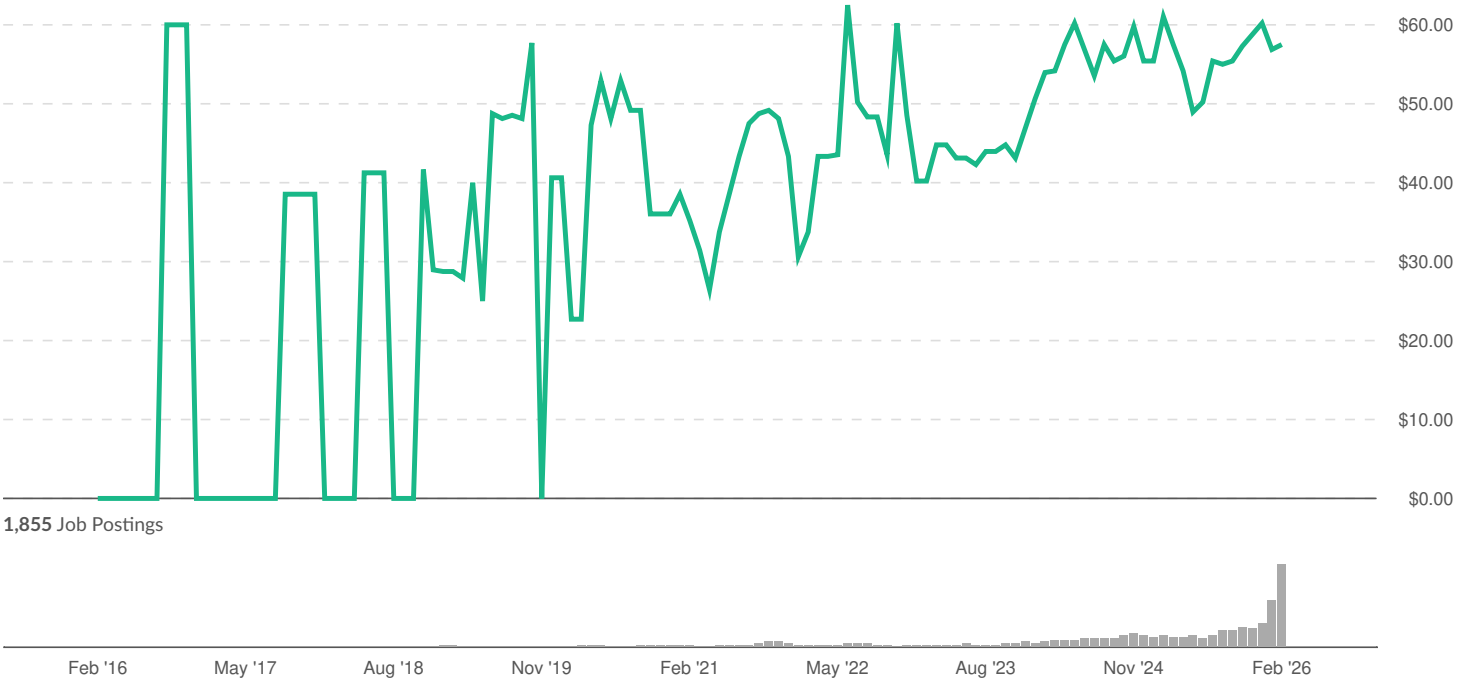
Median Advertised Salary



Advertised Salary Trend

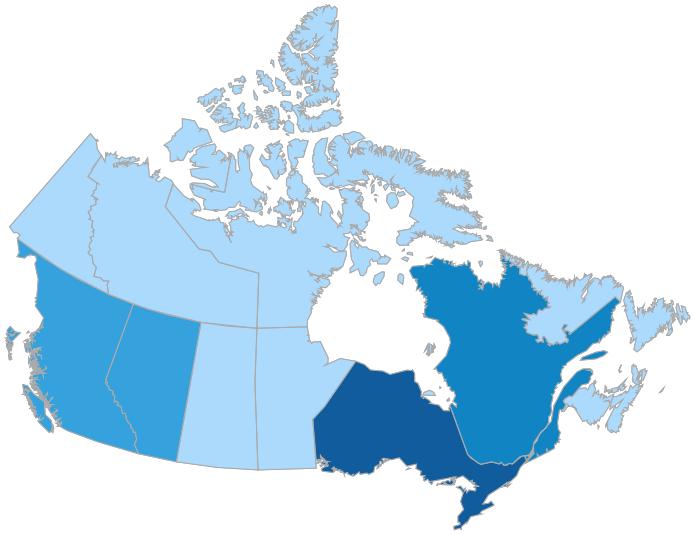
▲0.0% Feb 2016 – Feb 2026

$54.58 **Median**



1,855 Job Postings

Job Postings Regional Breakdown



Province	Unique Postings (Feb 2016 - Feb 2026)
Ontario	9,017
Quebec	2,390
British Columbia	1,552
Alberta	1,027
Nova Scotia	331

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Feb 2026	2,149	2 : 1
Jan 2026	1,669	2 : 1
Dec 2025	1,354	2 : 1
Nov 2025	1,159	3 : 1
Oct 2025	1,164	3 : 1
Sep 2025	1,065	3 : 1
Aug 2025	1,151	3 : 1
Jul 2025	894	3 : 1
Jun 2025	695	3 : 1
May 2025	712	2 : 1
Apr 2025	640	2 : 1
Mar 2025	543	2 : 1
Feb 2025	542	2 : 1
Jan 2025	518	2 : 1
Dec 2024	487	2 : 1
Nov 2024	491	3 : 1
Oct 2024	530	3 : 1
Sep 2024	459	3 : 1
Aug 2024	490	3 : 1
Jul 2024	380	3 : 1

Jun 2024	348	2 : 1
May 2024	311	2 : 1
Apr 2024	293	2 : 1
Mar 2024	300	2 : 1
Feb 2024	338	2 : 1
Jan 2024	250	2 : 1
Dec 2023	245	2 : 1
Nov 2023	261	2 : 1
Oct 2023	241	2 : 1
Sep 2023	211	2 : 1
Aug 2023	182	2 : 1
Jul 2023	238	2 : 1
Jun 2023	275	2 : 1
May 2023	262	2 : 1
Apr 2023	256	2 : 1
Mar 2023	273	2 : 1
Feb 2023	280	2 : 1
Jan 2023	314	2 : 1
Dec 2022	304	2 : 1
Nov 2022	436	2 : 1
Oct 2022	479	2 : 1
Sep 2022	466	2 : 1
Aug 2022	474	2 : 1
Jul 2022	477	2 : 1
Jun 2022	331	2 : 1
May 2022	355	2 : 1
Apr 2022	355	2 : 1
Mar 2022	362	2 : 1
Feb 2022	338	2 : 1
Jan 2022	319	2 : 1
Dec 2021	790	2 : 1

Nov 2021	777	2 : 1
Oct 2021	322	2 : 1
Sep 2021	323	2 : 1
Aug 2021	302	2 : 1
Jul 2021	277	2 : 1
Jun 2021	251	2 : 1
May 2021	249	2 : 1
Apr 2021	260	2 : 1
Mar 2021	235	2 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	4,287	28%
High school or GED	181	1%
Associate's degree	246	2%
Bachelor's degree	8,612	56%
Master's degree	6,245	40%
Ph.D. or professional degree	2,931	19%

Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	181	0	1%
Associate's degree	242	0	2%
Bachelor's degree	8,281	278	53%
Master's degree	2,025	3,129	13%
Ph.D. or professional degree	492	2,439	3%

Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	6,735	43%
0 - 1 Years	472	3%
2 - 3 Years	2,621	17%
4 - 6 Years	3,583	23%
7 - 9 Years	1,280	8%
10+ Years	817	5%

Top Companies Posting

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
IBM	1,719 / 858	2 : 1	
Deloitte	2,369 / 851	3 : 1	
Funded.club	772 / 431	2 : 1	
AMD	858 / 404	2 : 1	
Cognizant Technology Solutions	617 / 350	2 : 1	
Google	725 / 312	2 : 1	
Bell Canada	757 / 312	2 : 1	
NTT DATA	763 / 292	3 : 1	
Sanofi	613 / 259	2 : 1	
TD Bank	975 / 257	4 : 1	

Top Cities Posting

City	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Toronto, ON	10,425 / 4,836	2 : 1	
Montreal, QC	3,331 / 1,580	2 : 1	
Vancouver, BC	2,166 / 1,123	2 : 1	
Markham, ON	2,016 / 870	2 : 1	
Ottawa, ON	1,449 / 781	2 : 1	
Mississauga, ON	1,408 / 618	2 : 1	
Calgary, AB	1,124 / 546	2 : 1	
Edmonton, AB	584 / 282	2 : 1	
Halifax, NS	605 / 267	2 : 1	
Waterloo, ON	691 / 264	3 : 1	

Top Posted Occupations

Occupation (NOC)	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data scientists	13,480 / 6,340	2 : 1	
Software developers and programmers	8,063 / 4,370	2 : 1	
Database analysts and data administrators	3,386 / 1,548	2 : 1	
Software engineers and designers	2,282 / 1,209	2 : 1	
Computer engineers (except software engineers and designers)	1,976 / 1,080	2 : 1	
Information systems specialists	1,133 / 491	2 : 1	
Mathematicians, statisticians and actuaries	953 / 440	2 : 1	
Professional occupations in business management consulting	73 / 30	2 : 1	

Top Posted Occupations

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Software Developer / Engineer	10,345 / 5,579	2 : 1	
Artificial Intelligence Engineer	7,310 / 3,487	2 : 1	
Data Scientist	5,163 / 2,370	2 : 1	
Computer Systems Engineer / Architect	1,976 / 1,080	2 : 1	
Database Architect	2,045 / 966	2 : 1	
Data / Data Mining Analyst	1,414 / 612	2 : 1	
Technology Consultant	1,133 / 491	2 : 1	
Data Engineer	1,009 / 485	2 : 1	
Analytics Manager	951 / 438	2 : 1	

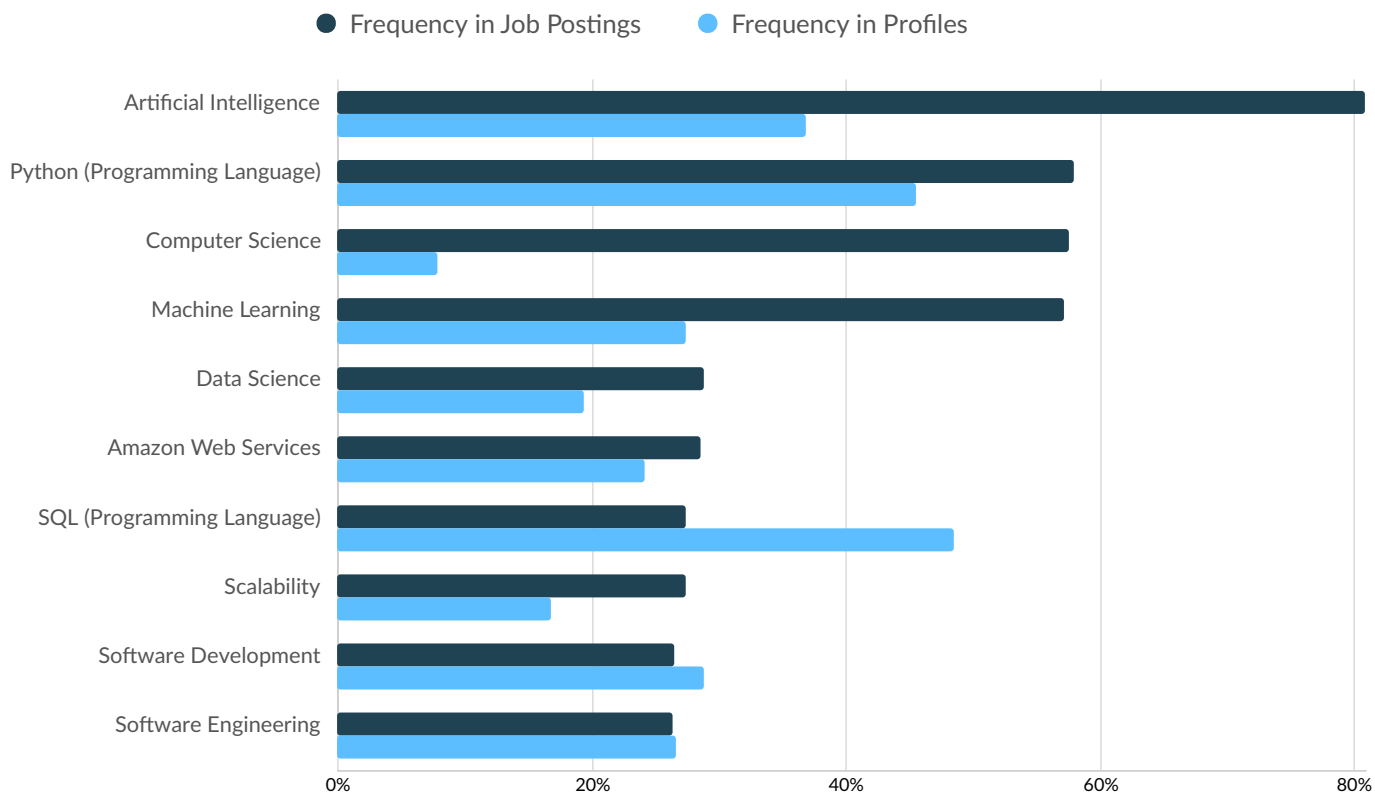
Top Posted Job Titles

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data Scientists	2,252 / 1,002	2 : 1	
Software Developers	1,709 / 872	2 : 1	
Machine Learning Engineers	808 / 398	2 : 1	
Software Engineers	687 / 283	2 : 1	
Artificial Intelligence Engineers	436 / 255	2 : 1	
Full Stack Developers	568 / 253	2 : 1	
Data Engineers	485 / 244	2 : 1	
Artificial Intelligence Managers	478 / 241	2 : 1	
Data Science Managers	448 / 194	2 : 1	
Solutions Architects	224 / 145	2 : 1	

Top Industries

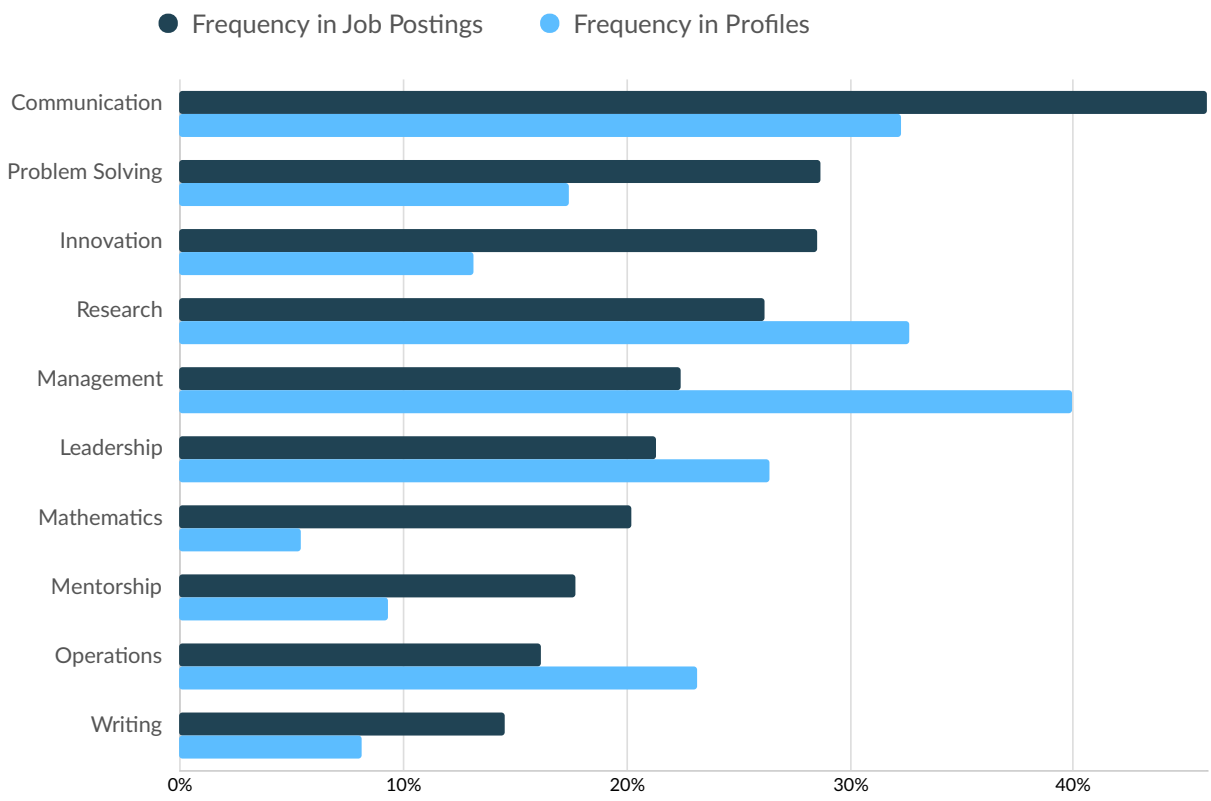
	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Commercial Banking	3,365 / 1,119	3 : 1	
Administrative Management and General Management Consulting Services	2,483 / 923	3 : 1	
Computer Terminal and Other Computer Peripheral Equipment Manufacturing	1,740 / 876	2 : 1	
Custom Computer Programming Services	1,668 / 796	2 : 1	
Software Publishers	1,348 / 646	2 : 1	
Offices of Certified Public Accountants	1,163 / 538	2 : 1	
Semiconductor and Related Device Manufacturing	1,031 / 504	2 : 1	
Web Search Portals and All Other Information Services	948 / 445	2 : 1	
Other Scientific and Technical Consulting Services	695 / 390	2 : 1	
Direct Property and Casualty Insurance Carriers	515 / 367	1 : 1	

Top Specialized Skills



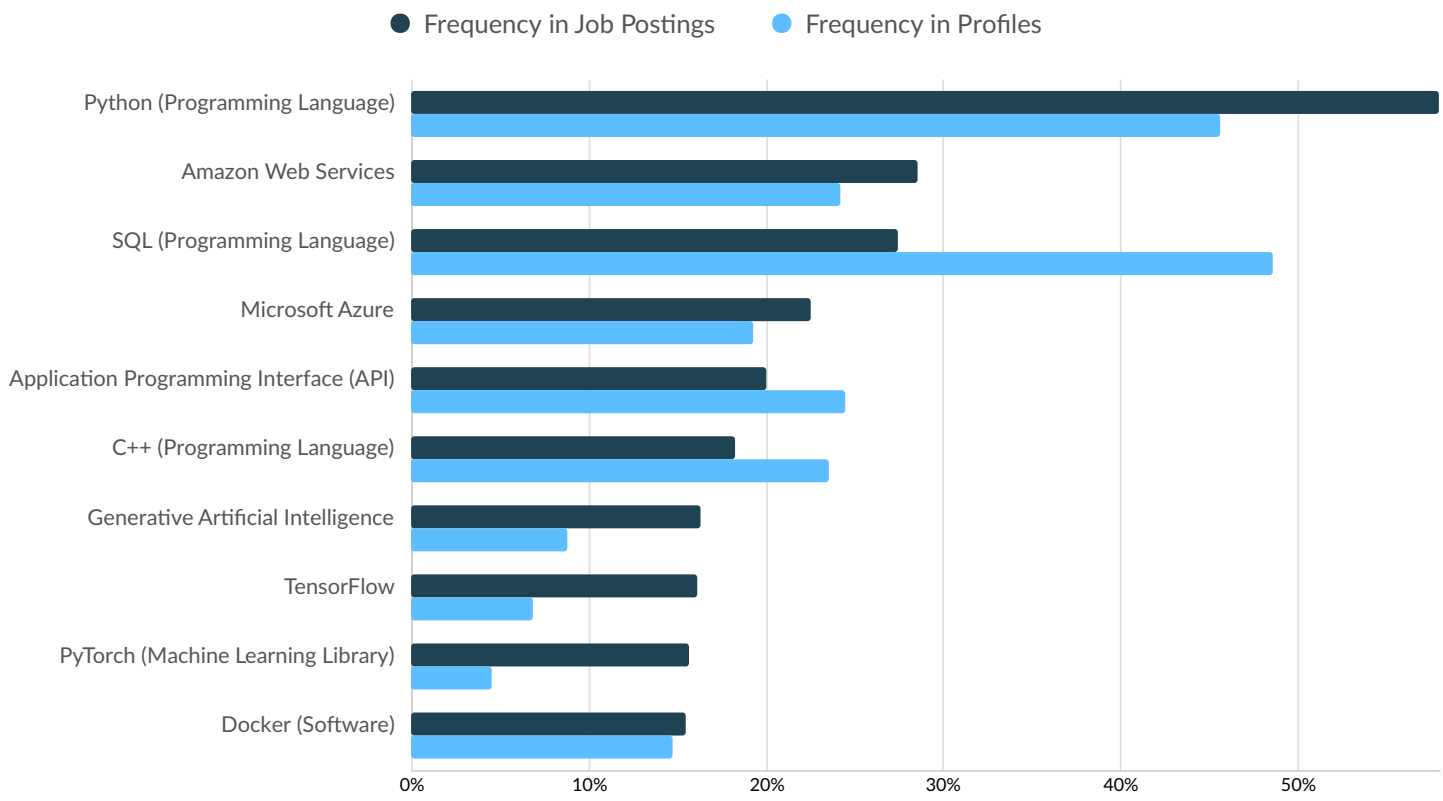
	Postings	% of Total Postings	Profiles	% of Total Profiles
Artificial Intelligence	12,546	81%	31,222	37%
Python (Programming Language)	8,989	58%	38,623	46%
Computer Science	8,924	58%	6,717	8%
Machine Learning	8,880	57%	23,307	28%
Data Science	4,481	29%	16,422	19%
Amazon Web Services	4,433	29%	20,538	24%
SQL (Programming Language)	4,259	27%	41,169	49%
Scalability	4,254	27%	14,274	17%
Software Development	4,106	26%	24,483	29%
Software Engineering	4,105	26%	22,559	27%

Top Common Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Communication	7,135	46%	27,367	32%
Problem Solving	4,447	29%	14,770	17%
Innovation	4,431	29%	11,147	13%
Research	4,062	26%	27,708	33%
Management	3,480	22%	33,864	40%
Leadership	3,307	21%	22,415	26%
Mathematics	3,145	20%	4,602	5%
Mentorship	2,749	18%	7,894	9%
Operations	2,512	16%	19,622	23%
Writing	2,265	15%	6,932	8%

Top Software Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Python (Programming Language)	8,989	58%	38,637	46%
Amazon Web Services	4,435	29%	20,549	24%
SQL (Programming Language)	4,261	27%	41,191	49%
Microsoft Azure	3,501	23%	16,330	19%
Application Programming Interface (API)	3,108	20%	20,772	25%
C++ (Programming Language)	2,838	18%	19,979	24%
Generative Artificial Intelligence	2,527	16%	7,465	9%
TensorFlow	2,509	16%	5,851	7%
PyTorch (Machine Learning Library)	2,432	16%	3,852	5%
Docker (Software)	2,407	16%	12,473	15%

Top Qualifications

	Postings with Qualification
Master Of Business Administration (MBA)	179
Microsoft Certified Professional	160
Security Clearance	154
Certified Information Systems Security Professional	90
Secret Clearance	70
Project Management Professional Certification	65
Valid Driver's License	60
Certified Information Security Manager	52
Microsoft Certified: Azure Solutions Architect Expert	48
Microsoft Azure Certification	43

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2016 - Feb 2026)
jobs.ca	2,495
indeed.com	2,049
myworkdayjobs.com	1,446
localwork.ca	1,238
adzuna.ca	1,071
workopolis.com	1,015
careerjet.ca	900
dejobs.org	690
jobillico.com	650
brassring.com	485
tiptopjob.com	458
theitjob.com	434
lever.co	396
fairygodboss.com	343
cognizant.com	323
careerbeacon.com	295
deloitte.ca	272
themuse.com	266
icims.com	248
amd.com	232
glassdoor.ca	217
taleo.net	213
jobbank.gc.ca	205
greenhouse.io	172
option-carriere.ca	151

Appendix B

Sample Postings

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom Services
Job Title: Artificial Intelligence/Machine Learning Engineers	

1229 Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning)

Engineerhttps:

//www.careerbeacon.com/posting/632654/procom-services/ingenieur-intelligence-articifielle

- span class="jpa-keyword-highlight">artificial
- span class="jpa-keyword-highlight">intelligence-machine-learning-engineer/montreal/?sref=emptyProcom Services
- Montral, QC Ingnieur Intelligence Articifielle /

Artificial Intelligence (Machine learning) Engineer Information Technology Procom Services Montral, Quebec Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de l'assurance. Notre client est situ Montral. Description des tches et responsabilits

- Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste
- Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details

- Artificial Intelligence (Machine learning) Engineer
- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, API's, Apps, NUI's et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills
- Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelor's Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy AI & machine learning software products Assignment Length6 months Contract
- Renewable or Permanent position Start dateImmediately Reference number

BH 232775

Apply

AI Developer

Link to Live Job Posting: Posting is no longer active

Location: Winnipeg, MB	**Company:** Ascenda Corporation
Job Title: UI Developers	

AI

Developer Job Location :

Winnipeg (Winnipeg Metropolitan, Manitoba, Canada)

Job Salary :

Competitive Posted On :

22 September 2017

Job Description :

Job Description

- h3•ABOUT THE JOB We are changing the way people think about customer service by leveraging

Artificial Intelligence, and we need your help! We are seeking an Artificial Intelligence Developer to help design, develop and implement AI technology We're looking for an entrepreneurial mindset, a fearless attitude and a passion to take AI to the customer service world You will be responsible for analyzing existing business process and drive the implementation of AI technologies across our company You will also work with a team of developers in the analysis, design, development, and maintenance of software solutions

JOB REQUIREMENTS

- A minimum of 5 years of technical software development experience, with specific experience in solution design and implementation
- Experience in practical machine learning development is required
- Experience in NET (C#) development is preferred
- Experience in Continuous Integration/Automated Deployment is preferred
- Experience working with Agile software development methodologies is preferred
- Significant experience with data integration and reporting is preferred
- Ability to prioritize and plan work activities as needed, while meeting aggressive deadlines and handle multiple and complex projects
- Excellent communication skills, with the ability to coach and mentor other team membersCompany Description
- h3•For information on our organization visit: 24-7intouch/careers

AI Developer

UI Developers — Unclassified in Winnipeg, MB (Sep 2017 - Nov 2017)

AI Developer

Link to Live Job Posting: Posting is no longer active

Location: Winnipeg, MB	**Company:** Unclassified
Job Title: UI Developers	

AI DeveloperAI Developer 24-7

Intouch Contact Cent Location :

Winnipeg•

Winnipeg Metropolitan, Manitoba, Canada Type :

Permanent Jobs Salary :

Competitive Main Industry :

Search Information Technology Jobs Job ID :

72344262

Posted On :

22 September 2017 Job Description

- h3•ABOUT THE JOB We are changing the way people think about customer service by leveraging

Artificial Intelligence, and we need your help! We are seeking an Artificial Intelligence Developer to help design, develop and implement AI technology. We're looking for an entrepreneurial mindset, a fearless attitude and a passion to take AI to the customer service world. You will be responsible for analyzing existing business process and drive the implementation of AI technologies across our company. You will also work with a team of developers in the analysis, design, development, and maintenance of software solutions.

JOB REQUIREMENTS

- A minimum of 5 years of technical software development experience, with specific experience in solution design and implementation
- Experience in practical machine learning development is required
- Experience in .NET (C#) development is preferred
- Experience in Continuous Integration/Automated Deployment is preferred
- Experience working with Agile software development methodologies is preferred
- Significant experience with data integration and reporting is preferred
- Ability to prioritize and plan work activities as needed, while meeting aggressive deadlines and handle multiple and complex projects
- Excellent communication skills, with the ability to coach and mentor other team membersCompany Description
- h3•For information on our organization visit: 24-7intouch/careers

AI Developer

Artificial Intelligence & Machine Learning Research Scientist - Auton

Link to Live Job Posting: Posting is no longer active

Location: Markham, ON	**Company:** General Motors
Job Title: Machine Learning Research Scientists	

Canada United States Artificial Intelligence & Machine Learning Research Scientist - Autonomous Markham, Ontario, Canada Position summary Artificial Intelligence & Machine Learning Research Scientist - Autonomous - ENG0034116 Description Automated Driving is a major growth area in the automotive industry. General Motors Global Research and Development offers exciting opportunity for talented and motivated researchers and engineers in this area. We are looking for individual contributors who are capable of driving design solutions and prototyping advanced artificial intelligence/machine learning techniques to stretch the capability of GM autonomous vehicle research and development programs. They will conduct research and development to identify new Artificial Intelligence (AI) / Machine Learning (ML) technology paradigms for future GM vehicles, develop prototype software on GM test vehicles for state-of-the-art supervised, unsupervised and reinforcement machine learning techniques. They will contribute to GM autonomous vehicle technology strategy and produce innovative AI / ML solutions for autonomous vehicle perception, planning and behavior decision making modules. Our high-level AI / ML landscape includes: Deep neural networks Agent-based modeling / Symbolic artificial intelligence Deep reinforcement learning Hybrid-systems with heuristic and AI/ML models and shared autonomy End-to-end systems Application of AI / ML for autonomous vehicle perception, planning and behavior systems

Responsibilities:

Work as an independent yet integral member of a team to develop innovative and creative AI / ML solutions for highly automated vehicles with world leading experts of autonomous vehicles. Develop and maintain high quality C/C++ and Python code under Linux for general purpose PCs and embedded hardware platforms. Test and debug software on autonomous research vehicle prototypes. Plan and execute complex and challenging technical projects. Possess strong interpersonal skills and consistently demonstrate ability to work in a team environment and with cross-functional global teams. Maintain state-of-the-art technical expertise in artificial intelligence, machine learning and software programming. Generate intellectual property.

Qualifications Required:

PhD with 2+ years or Masters with 5+ years of experience in computer science, electrical engineering, mathematics, physics. Expert-level knowledge in learning algorithms such as inverse reinforcement learning, deep reinforcement learning and probabilistic inference for decision support systems. Knowledge and hands-on expertise in deep neural network topologies such as convolutional nets, recurrent nets, RBMs, causal reasoning, probabilistic programming. Strong software development skills in C/C++ under Linux environments with a proven ability to deliver high quality software coding on time. Mathematically minded with experience in manipulating high-volume, high-dimensionality data from varying sources to highlight patterns, anomalies, relationships and trends with machine learning techniques. Develop requirements and evaluation methods for artificial intelligence technologies and benchmark vendor technologies. Experience in algorithm development, prototype system development and prototype software implementation on hardware platforms.

Preferred:

Education background in mobile robotics / autonomous vehicles with knowledge in environmental perception, 3D modelling, route planning, path planning, trajectory planning and motion planning. Experience in autonomous vehicle prototype system development, integration and testing. Modeling data abstractions employing multiple non-linear mathematical and statistical modeling approaches Hands-on development experience in one or more of the following areas: o GPU programming, NVidia CUDA o OpenCL, Matlab, Python, OpenCV o Caffe, CNTK,

TensorFlow frameworks or any symbolic AI-based high-level languages / virtual machines What Makes Us Attractive? General Motors is reinventing itself as a company. We are driving forward, accelerating change, and opening the door to new thinking and advanced technology. Our vision is to design, build and sell the worlds best vehicles. General Motors of Canada strives for an open, interactive, and dynamic work environment that promotes a rapid exchange of ideas and information. Our employees represent a true cross-section of cultures, demographics, and lifestyles, which help General Motors to succeed worldwide. General Motors of Canada is continually looking for qualified candidates who have the ideas and ambition to drive GM forward as a faster moving, more agile, highly innovative developer, manufacturer, and marketer of automotive components and vehicles. When you join one of the largest organizations in the world, you can expect a rewarding experience and benefits on a similar scale.

This includes:

Everything you need to develop your skills and realize your career goals. An environment which encourages a balance between work and personal life. A culture where collaboration and team work is fostered. A competitive total compensation package. A comprehensive benefit and retirement savings program to protect you and your family. The resources and support you need for your health and well-being. A company that is committed to supporting organizations and programs focused on safety, STEM education, community development, and environment & energy. For more information about General Motors of Canada or to search other available opportunities, please visit our website at www.gm.ca/careers. We would like to thank all candidates for expressing interest however only those selected for interviews will be contacted. Pre-employment screening will be required. Accommodation is available for applicants with disabilities. Should you be contacted by General Motors of Canada Ltd, please advise if you require accommodation. General Motors of Canada values diversity and is an equal opportunity employer.

Job Engineering Primary Location Canada-Ontario-Markham Posting Date :

Mar 23, 2017, 3:29:18 PM Apr 23, 2017, 3:59:00 AM backToTop Engineering

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom
Job Title: Artificial Intelligence/Machine Learning Engineers	

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

- Montral,QCView complete profileAdd to favorites
- Job summary
- Internal reference No.3515
- Starting date: As soon as possible
- Number of positions available: 1

- Salary:

  To be discussed
- Work schedule:
- Job status
- Work shift
- Description Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de lassurance. Notre client est situ Montral. Description des tches et responsabilits Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details Artificial Intelligence (Machine learning) Engineer

- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, APIs, Apps, NUIs et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelors Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy

AI & machine learning software products Assignment Length6 months Contract Renewable or Permanent position Start dateImmediately Reference number

BH 232775

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Job Posting Analytics

Lightcast Q3 2025 Data Set

March 2026

1455 Boulevard de Maisonneuve O

Parameters

Select Timeframe: Feb 2016 - Feb 2026

Posting Language: All Postings

Lightcast Occupations:

Results should include

Code	Description
231113	Data / Data Mining Analyst
231114	Data Scientist
231118	Analytics Manager
231120	Artificial Intelligence Engineer
231210	Data Engineer
231213	Database Architect
231510	Computer Systems Engineer / Architect
231514	Technology Consultant
231715	Software Developer / Engineer

Regions:

Code	Description
24	Quebec

Advertised Salary: Include all postings regardless

Minimum Experience Required: Any

Education Level: Any

Job Type: Include Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search: "Artificial Intelligence" or "AI"

Posting Type: Active Postings

Job Postings Overview

2,390	425	2 : 1
Unique Postings	**Companies Posting**	**Posting Intensity**
4,615 Total Postings	130,570 Total Companies	Regional Average: 2 : 1

Advertised Salary

There are 158 advertised salary observations (7% of the 2,390 matching postings).

$50.34/hr

Median Advertised Salary



Advertised Salary Trend

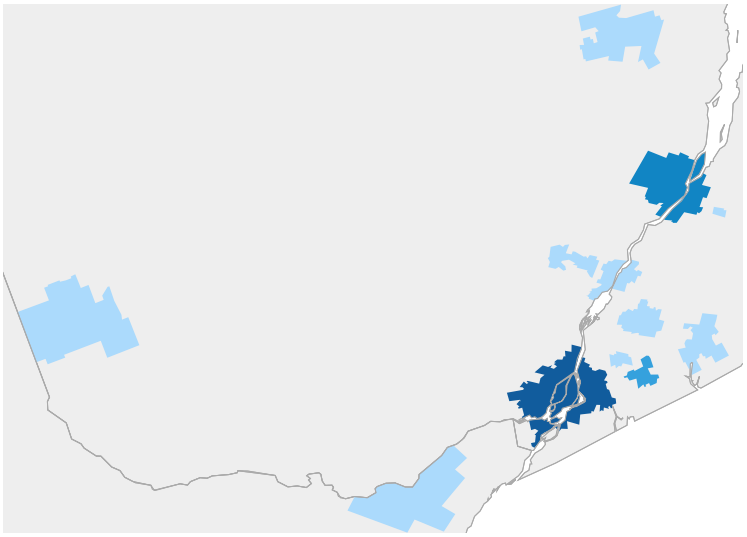
▲0.0% Feb 2016 – Feb 2026

$50.34 **Median**



158 Job Postings

Job Postings Regional Breakdown



CMA	Unique Postings (Feb 2016 - Feb 2026)
Montréal	1,830
Québec	331
Granby	13
Sherbrooke	7
Ottawa - Gatineau	7

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Feb 2026	243	2 : 1
Jan 2026	222	2 : 1
Dec 2025	180	2 : 1
Nov 2025	163	3 : 1
Oct 2025	180	4 : 1
Sep 2025	172	4 : 1
Aug 2025	175	4 : 1
Jul 2025	136	3 : 1
Jun 2025	120	3 : 1
May 2025	127	2 : 1
Apr 2025	106	2 : 1
Mar 2025	81	2 : 1
Feb 2025	73	2 : 1
Jan 2025	62	2 : 1
Dec 2024	61	2 : 1
Nov 2024	54	2 : 1
Oct 2024	56	2 : 1
Sep 2024	52	2 : 1
Aug 2024	69	2 : 1
Jul 2024	55	2 : 1

Jun 2024	51	2 : 1
May 2024	56	2 : 1
Apr 2024	57	2 : 1
Mar 2024	52	2 : 1
Feb 2024	59	2 : 1
Jan 2024	39	2 : 1
Dec 2023	30	2 : 1
Nov 2023	30	2 : 1
Oct 2023	24	2 : 1
Sep 2023	32	2 : 1
Aug 2023	23	2 : 1
Jul 2023	43	1 : 1
Jun 2023	45	2 : 1
May 2023	41	1 : 1
Apr 2023	38	2 : 1
Mar 2023	49	1 : 1
Feb 2023	53	1 : 1
Jan 2023	58	1 : 1
Dec 2022	49	1 : 1
Nov 2022	62	1 : 1
Oct 2022	60	2 : 1
Sep 2022	67	1 : 1
Aug 2022	62	2 : 1
Jul 2022	58	2 : 1
Jun 2022	43	2 : 1
May 2022	47	2 : 1
Apr 2022	55	2 : 1
Mar 2022	67	2 : 1
Feb 2022	73	2 : 1
Jan 2022	63	2 : 1
Dec 2021	112	2 : 1

Nov 2021	101	2 : 1
Oct 2021	51	2 : 1
Sep 2021	44	1 : 1
Aug 2021	44	1 : 1
Jul 2021	48	2 : 1
Jun 2021	42	2 : 1
May 2021	40	2 : 1
Apr 2021	44	2 : 1
Mar 2021	49	2 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	651	27%
High school or GED	19	1%
Associate's degree	16	1%
Bachelor's degree	1,293	54%
Master's degree	928	39%
Ph.D. or professional degree	488	20%

Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	19	0	1%
Associate's degree	15	0	1%
Bachelor's degree	1,264	23	53%
Master's degree	352	410	15%
Ph.D. or professional degree	89	399	4%

Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	1,143	48%
0 - 1 Years	47	2%
2 - 3 Years	374	16%
4 - 6 Years	532	22%
7 - 9 Years	189	8%
10+ Years	105	4%

Top Companies Posting

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Intact Financial Corp	180 / 142	1 : 1	
Deloitte	477 / 114	4 : 1	
Bell Canada	259 / 99	3 : 1	
National Bank of Canada	230 / 84	3 : 1	
IBM	117 / 75	2 : 1	
NTT DATA	123 / 52	2 : 1	
IQVIA	100 / 52	2 : 1	
Funded.club	71 / 49	1 : 1	
Intact	91 / 48	2 : 1	
Brainbox Ai	47 / 41	1 : 1	

Top Cities Posting

City	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Montreal, QC	3,331 / 1,580	2 : 1	
Quebec City, QC	301 / 189	2 : 1	
Québec City, QC	234 / 131	2 : 1	
Dorval, QC	152 / 67	2 : 1	
Kirkland, QC	82 / 34	2 : 1	
Montréal, QC	34 / 30	1 : 1	
Laval, QC	40 / 21	2 : 1	
Longueuil, QC	29 / 21	1 : 1	
Brossard, QC	27 / 18	2 : 1	
Bromont, QC	25 / 12	2 : 1	

Top Posted Occupations

Occupation (NOC)	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data scientists	2,215 / 1,120	2 : 1	
Software developers and programmers	1,340 / 760	2 : 1	
Database analysts and data administrators	396 / 174	2 : 1	
Computer engineers (except software engineers and designers)	205 / 109	2 : 1	
Software engineers and designers	160 / 95	2 : 1	
Information systems specialists	160 / 73	2 : 1	
Mathematicians, statisticians and actuaries	133 / 55	2 : 1	
Professional occupations in business management consulting	6 / 4	2 : 1	

Top Posted Occupations

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Software Developer / Engineer	1,500 / 855	2 : 1	
Artificial Intelligence Engineer	1,305 / 637	2 : 1	
Data Scientist	707 / 397	2 : 1	
Computer Systems Engineer / Architect	205 / 109	2 : 1	
Database Architect	203 / 95	2 : 1	
Data Engineer	203 / 86	2 : 1	
Data / Data Mining Analyst	199 / 83	2 : 1	
Technology Consultant	160 / 73	2 : 1	
Analytics Manager	133 / 55	2 : 1	

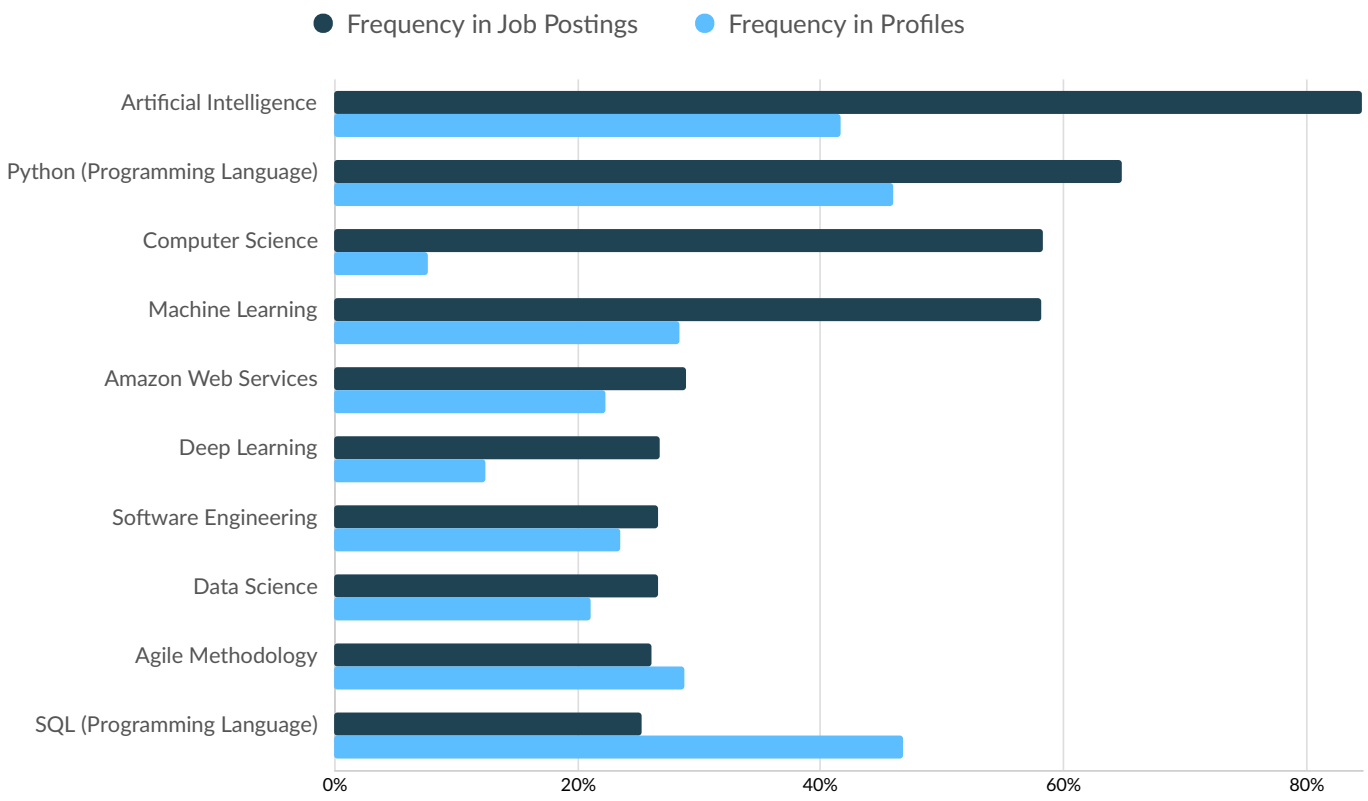
Top Posted Job Titles

	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Data Scientists	269 / 160	2 : 1	
Software Developers	172 / 119	1 : 1	
Full Stack Developers	168 / 74	2 : 1	
Artificial Intelligence Managers	126 / 67	2 : 1	
Machine Learning Engineers	65 / 46	1 : 1	
Directors of Artificial Intelligence	71 / 40	2 : 1	
Artificial Intelligence Architects	59 / 38	2 : 1	
Artificial Intelligence Engineers	79 / 37	2 : 1	
Artificial Intelligence Analysts	112 / 37	3 : 1	
Data Engineers	60 / 31	2 : 1	

Top Industries

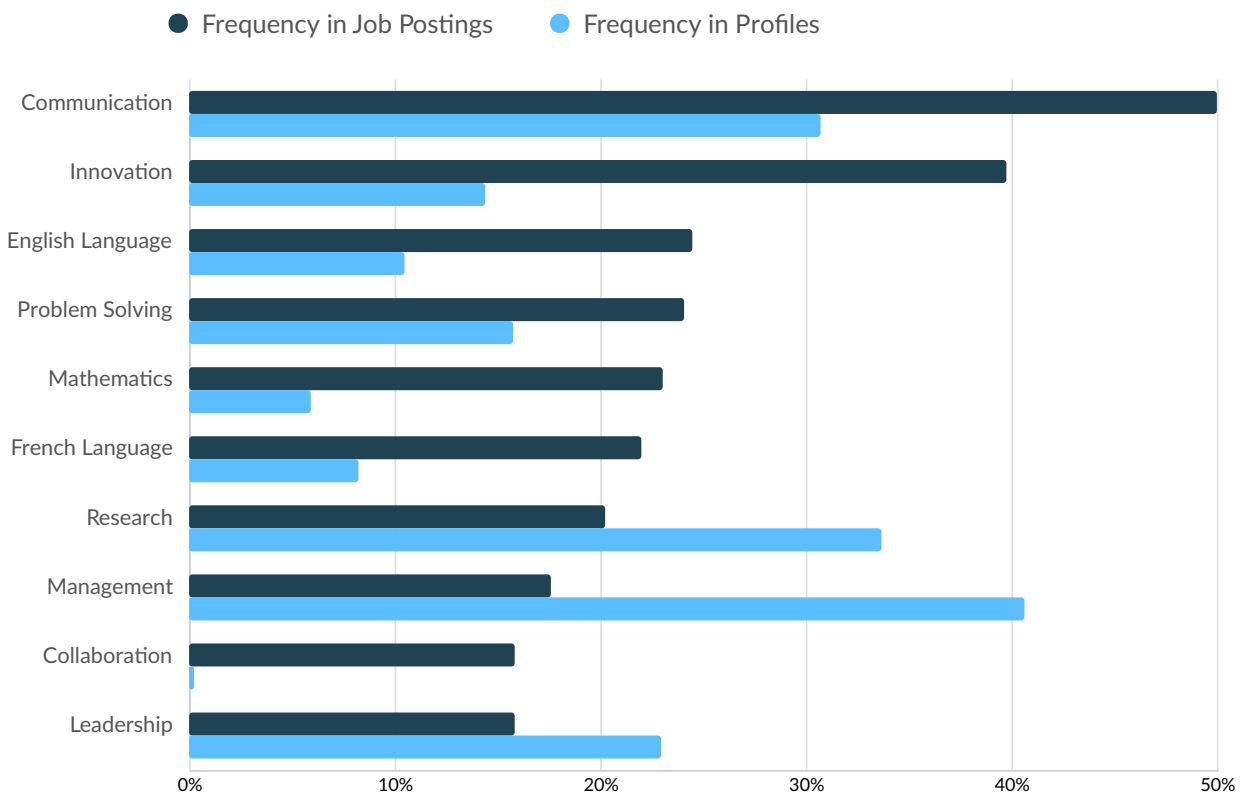
	Total/Unique (Feb 2016 - Feb 2026)	Posting Intensity	Unique Postings Trend (Feb 2016 - Feb 2026)
Direct Property and Casualty Insurance Carriers	277 / 195	1 : 1	
Commercial Banking	442 / 170	3 : 1	
Custom Computer Programming Services	279 / 158	2 : 1	
Administrative Management and General Management Consulting Services	510 / 128	4 : 1	
Software Publishers	282 / 124	2 : 1	
Offices of Certified Public Accountants	293 / 117	3 : 1	
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	134 / 77	2 : 1	
Computer Terminal and Other Computer Peripheral Equipment Manufacturing	117 / 75	2 : 1	
Temporary Help Services	63 / 48	1 : 1	
Employment Placement Agencies	72 / 44	2 : 1	

Top Specialized Skills



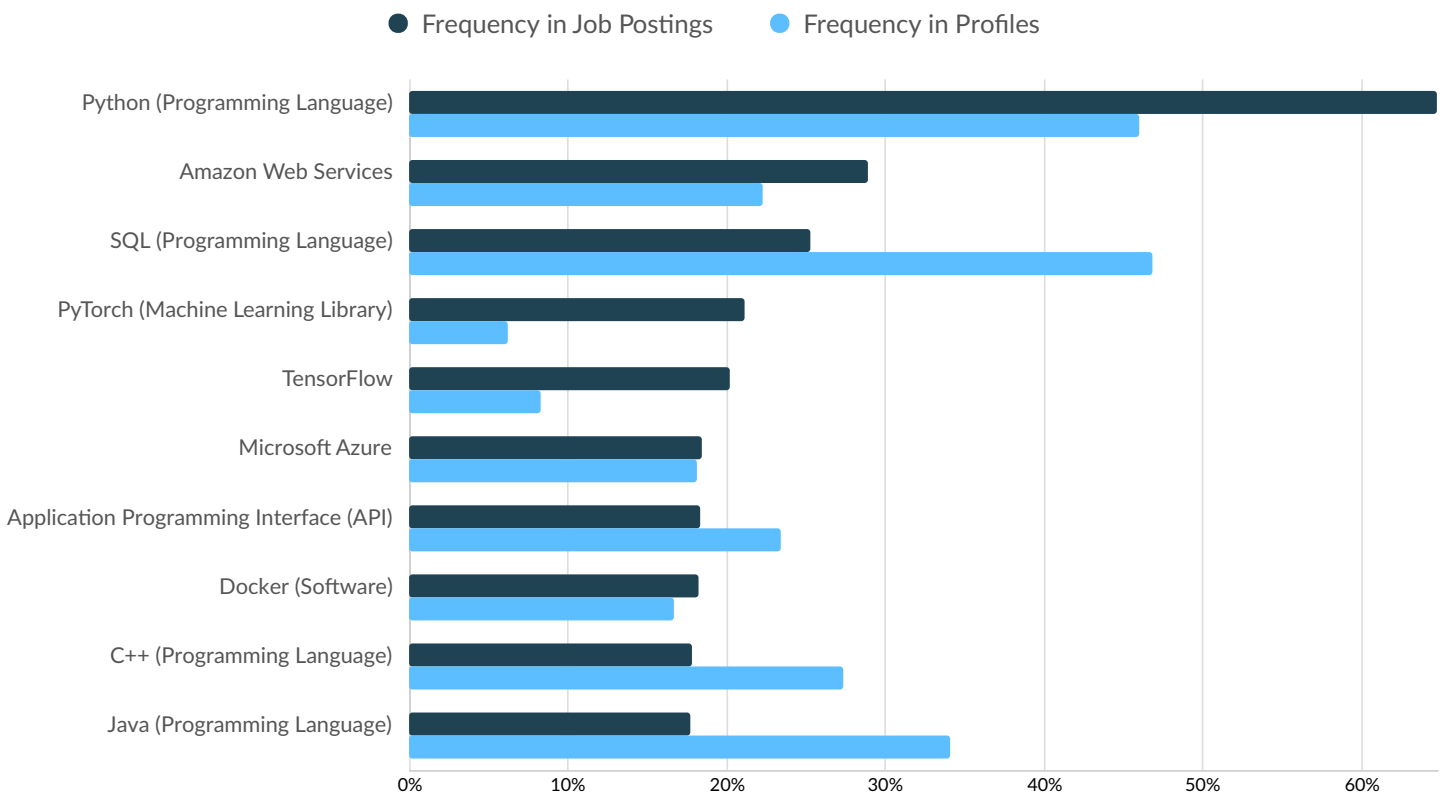
	Postings	% of Total Postings	Profiles	% of Total Profiles
Artificial Intelligence	2,022	85%	3,721	42%
Python (Programming Language)	1,549	65%	4,107	46%
Computer Science	1,394	58%	693	8%
Machine Learning	1,392	58%	2,537	28%
Amazon Web Services	691	29%	1,993	22%
Deep Learning	642	27%	1,114	12%
Software Engineering	638	27%	2,099	23%
Data Science	636	27%	1,888	21%
Agile Methodology	624	26%	2,575	29%
SQL (Programming Language)	605	25%	4,183	47%

Top Common Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Communication	1,195	50%	2,743	31%
Innovation	950	40%	1,284	14%
English Language	586	25%	934	10%
Problem Solving	575	24%	1,407	16%
Mathematics	550	23%	530	6%
French Language	526	22%	739	8%
Research	483	20%	3,007	34%
Management	420	18%	3,628	41%
Collaboration	379	16%	19	0%
Leadership	378	16%	2,053	23%

Top Software Skills



	Postings	% of Total Postings	Profiles	% of Total Profiles
Python (Programming Language)	1,549	65%	4,110	46%
Amazon Web Services	691	29%	1,994	22%
SQL (Programming Language)	605	25%	4,187	47%
PyTorch (Machine Learning Library)	506	21%	554	6%
TensorFlow	484	20%	744	8%
Microsoft Azure	440	18%	1,624	18%
Application Programming Interface (API)	438	18%	2,095	23%
Docker (Software)	436	18%	1,493	17%
C++ (Programming Language)	426	18%	2,449	27%
Java (Programming Language)	424	18%	3,044	34%

Top Qualifications

	Postings with Qualification
Security Clearance	24
Master Of Business Administration (MBA)	21
Microsoft Certified Professional	20
Certified Information Systems Security Professional	15
Microsoft Azure Certification	14
AWS Certified Solutions Architect	13
AWS Certified Security Specialty	11
Valid Driver's License	11
Certified Information Security Manager	11
Secret Clearance	10

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2016 - Feb 2026)
indeed.com	339
jobs.ca	330
localwork.ca	207
workopolis.com	162
careerjet.ca	156
myworkdayjobs.com	142
dejobs.org	117
theitjob.com	102
adzuna.ca	87
tiptopjob.com	87
jobillico.com	81
jobbank.gc.ca	65
intactfc.com	58
deloitte.ca	56
intact.ca	56
bce.ca	55
fairygodboss.com	48
option-carriere.ca	45
taleo.net	44
bamboohr.com	39
greenhouse.io	35
lever.co	34
nbc.ca	34
gurulink.ca	32
careerbeacon.com	30

Appendix B

Sample Postings

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom Services
Job Title: Artificial Intelligence/Machine Learning Engineers	

1229 Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning)

Engineerhttps:

//www.careerbeacon.com/posting/632654/procom-services/ingenieur-intelligence-articifielle

- span class="jpa-keyword-highlight">artificial
- span class="jpa-keyword-highlight">intelligence-machine-learning-engineer/montreal/?sref=emptyProcom Services
- Montral, QC Ingnieur Intelligence Articifielle /

Artificial Intelligence (Machine learning) Engineer Information Technology Procom Services Montral, Quebec Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de l'assurance. Notre client est situ Montral. Description des tches et responsabilits

- Ingnieur Intelligence Articifielle
- Crer et dployer des produits logiciels bass sur l'IA et l'apprentissage par machine en production;
- Soutenir, dpanner et optimiser les produits logiciels bass sur l'apprentissage de l'IA et de la machine en production cycle continu de la machine learning;
- Techniques et approches de formation l'apprentissage de l'AI et de l'apprentissage en machine;
- Technologies IA dans les domaines de la langue, de la vision, de la parole, d'Infrence et al;
- Technologies d'apprentissage machine dans les domaines de l'apprentissage en profondeur, des rseaux de neurones, Clustering et al;
- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste
- Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details

- Artificial Intelligence (Machine learning) Engineer
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- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
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- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
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- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills
- Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelor's Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy AI & machine learning software products Assignment Length6 months Contract
- Renewable or Permanent position Start dateImmediately Reference number

BH 232775

Apply

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Procom
Job Title: Artificial Intelligence/Machine Learning Engineers	

Ingnieur Intelligence Articifielle / Artificial Intelligence (Machine learning) Engineer

- Montral,QCView complete profileAdd to favorites
- Job summary
- Internal reference No.3515
- Starting date: As soon as possible
- Number of positions available: 1

- Salary:

  To be discussed
- Work schedule:
- Job status
- Work shift
- Description Ingnieur Intelligence Articifielle Dans le cadre de ses ententes avec ses diffrents clients, Procom est actuellement la recherche d'un Ingnieur Intelligence Articifielle pour une entreprise dans le domaine de lassurance. Notre client est situ Montral. Description des tches et responsabilits Ingnieur Intelligence Articifielle
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- Technologies d'ingnierie logicielle dans les domaines des services, API, Apps, NUI's et al;
- Pratiques d'ingnierie logicielle telles que Agile, Devops, CI et CD et al;
- Technologies Cloud dans les domaines de IaaS, PaaS, SaaS. Exigences du poste Ingnieur Intelligence Articifielle
- 2 ans et plus avec des technologies de machine learning (production);
- 2 ans et plus avec des technologies d'intelligence artificielle (production);
- Baccalaurat en informatique, ingnierie logicielle ou exprience pertinente.

Autres exigences:

- Curiosit, courage et confiance pour exceller dans ce rle;
- Humilit, modestie et collaboration pour prosprer dans cette quipe;
- Comptence dans l'analyse de logiciels, l'analyse de code, l'analyse des besoins, la revue de logiciel, l'identification des mtriques de code, l'analyse de la fiabilit des logiciels;
- Comptent et capable de s'adapter des environnements d'excution sophistiqus et complexes de la technologie AI & ML;
- Comprendre les exigences d'infrastructure pour construire et dployer des produits de logiciels d'apprentissage de l'IA et de l'appareil.

Type de posteContractuel 6 mois avec de fortes possibilits de renouvellement ou poste permanent Date de dbutImmdiatement Numro de rfrence

BH 232775

_____

ENGLISH VERSION

_____ Artificial Intelligence (Machine learning) Engineer On behalf of your client Procom is searching for an Artificial Intelligence (Machine learning) Engineer for one of our client in the insurance sector. Our client is located in Montreal. Job Details Artificial Intelligence (Machine learning) Engineer

- Built and deployed AI and machine learning based software products in production;
- Supporting, troubleshooting and optimizing AI and machine learning based software products in production;
- Continuous machine learning lifecycle;
- AI & machine learning training techniques and approaches;
- AI technologies in the areas of Language, Vision, Speech, Inference and al;
- Machine learning technologies in the areas of Deep Learning, Neural Nets, Clustering et al;
- Software engineering technologies in the areas of Services, APIs, Apps, NUIs et al;
- Software engineering practices such as Agile, Devops, CI & CD et al;
- Cloud technologies in the areas of IaaS, PaaS, SaaS. Mandatory Skills Artificial Intelligence (Machine learning) Engineer
- 8+ years in software development / engineering (production);
- 2+ years with machine learning technologies (production);
- 2+ years with artificial intelligence technologies (production);
- Bachelors Degree in Computer Science, Software Engineering or relevant experience.

Other requirements:

- Curiosity, courage and confidence to excel in this role
- Humility, Modesty and Collaboration to thrive in this team
- Proficient in software analysis, code analysis, requirements analysis, software review, identification of code metrics, software reliability analysis
- Proficient and able to adapt to highly evolving and complex AI & ML technology runtime environments
- Understand the infrastructure requirements to build and deploy

AI & machine learning software products Assignment Length6 months Contract Renewable or Permanent position Start dateImmediately Reference number

BH 232775

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Engineer Artificial Intelligence

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Sra Staffing
Job Title: Artificial Intelligence Engineers	

Engineer Artificial Intelligence

- Montral,QC View complete profileAdd to favorites
- Job summary
- Starting date: As soon as possible
- Number of positions available: 1

- Salary:

  To be discussed
- Work schedule:

Full time

- Job status:

Permanent

- Work shift:

Day

- Work environment
- Description As a member of the Software Engineering and R & D team, you will have great challenges to overcome and that is why we are looking for a highly motivated person who will collaborate with various groups within the organization, including software engineering, data science, industrial user experience and R & D teams.

The individual will be involved in the construction and support of the basic AI system used by the various company teams for the delivery of artificial intelligence capabilities, software and features.

Qualifications:

- 2 years and over in development / software engineering (production)
- 2 years and older with machine learning technologies (production)
- 2 years and older with artificial intelligence technologies (production)
- Bachelor's degree in computer science, software engineering or relevant experience Skills sought The qualified candidate must have
- Python programming (Pandas, SkLearn etc)
- Create and deploy software products based on AI and machine learning in production
- Support, troubleshoot and optimize software products based on AI and machine learning in production (Virtual Environment Management and Docker Containers)
- Continuous machine learning cycle
- IA technologies in the areas of time series and sensor data
- Machine Learning Technologies
- Software engineering technologies in the areas of services, APIs, applications, NUI and others
- Software engineering practices such as Agile, Devops, CI and CD and others
- Cloud technologies in the areas of IaaS, PaaS, SaaS (An asset)
- French Spoken and Written (Writing / Documentation / Technical Reports etc)

- Report writing / English documentation.
- Requirements
- Level of education undetermined
- Diploma undetermined
- Work experience (years) 3-5 years
- Written languages

Fr :

Advanced En :

Advanced

- Spoken languages

Fr :

Advanced En :

Advanced

Director, Artificial Intelligence

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Randstad
Job Title: Directors of Artificial Intelligence	

Director, Artificial Intelligence

- Montral,QC View complete profileAdd to favorites
- Job summary
- Internal reference No.s2016072
- Starting date: As soon as possible

- Salary:

  To be discussed
- Work schedule:
- -Job status:

Permanent

- Work shift
- -Work environment
- Description Randstad is partnering with a worlds leader in technology to recruit for an experienced and passionate leader for our AI research team in Montral. You bring a broad knowledge of machine learning algorithms and techniques to help create the next generation of intelligent products/services. You are excited by the opportunity to take ownership to grow a technical team and will mentor a growing team of AI researchers and foster an environment of world class research.

Responsibilities:

You will mentor and manage a growing team of AI researchers. You will foster an environment where the team members work collaboratively together and where they are empowered and challenged to create world class research. Directly influence strategic direction and make meaningful technical contributions at the global level; support R&D executives' efforts in business development and technology exploration Lead the team to develop machine learning algorithms applicable to the next generation of intelligent products/services development Build links with the local universities and tech community. As the ambassador you will create joint research initiatives with the universities and the emerging AI community in Montral. Leading, managing, and growing engineering teams.

Qualifications:

Ph.D. or Masters degree in Computer Science or Electrical Engineering (major in Machine Learning) Experience in Artificial Intelligence, Machine Learning, Natural Language Processing or other related areas 10+ publications of top conferences or journals in AI field for past 10 years Strong background in a broad spectrum of machine learning algorithm including unsupervised, supervised, and reinforcement learnings and a variant of neural network models. Knowledge of machine perception, natural language processing, speech processing, and image recognition Strong perspective on current and emerging machine learning trends Excellent communication and interpersonal skills to work effectively with other leaders in the company, such as senior executives in HQ and other sites Interested in hearing more? Please send your details to guillaume.dion@randstad.ca

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Director, Artificial Intelligence

Link to Live Job Posting: Posting is no longer active

Location: Montreal, QC	**Company:** Randstad
Job Title: Directors of Artificial Intelligence	

Director, Artificial Intelligence

- 1751 rue Richardson, Montral,QC View complete profileAdd to favorites
- Job summary
- Internal reference No.r2016072
- Starting date: As soon as possible

- Salary:

  To be discussed
- Work schedule:
- -Job status
- -Work shift
- -Work environment
- Description Randstad is partnering with a worlds leader in technology to recruit for an experienced and passionate leader for our AI research team in Montral. You bring a broad knowledge of machine learning algorithms and techniques to help create the next generation of intelligent products/services. You are excited by the opportunity to take ownership to grow a technical team and will mentor a growing team of AI researchers and foster an environment of world class research.

Responsibilities:

You will mentor and manage a growing team of AI researchers. You will foster an environment where the team members work collaboratively together and where they are empowered and challenged to create world class research. Directly influence strategic direction and make meaningful technical contributions at the global level; support R&D executives' efforts in business development and technology exploration Lead the team to develop machine learning algorithms applicable to the next generation of intelligent products/services development Build links with the local universities and tech community. As the ambassador you will create joint research initiatives with the universities and the emerging AI community in Montral. Leading, managing, and growing engineering teams.

Qualifications:

Ph.D. or Masters degree in Computer Science or Electrical Engineering (major in Machine Learning) Experience in Artificial Intelligence, Machine Learning, Natural Language Processing or other related areas 10+ publications of top conferences or journals in AI field for past 10 years Strong background in a broad spectrum of machine learning algorithm including unsupervised, supervised, and reinforcement learnings and a variant of neural network models. Knowledge of machine perception, natural language processing, speech processing, and image recognition Strong perspective on current and emerging machine learning trends Excellent communication and interpersonal skills to work effectively with other leaders in the company, such as senior executives in HQ and other sites Interested in hearing more? Please send your details to guillaume.dion@randstad.ca

- Requirements
- Level of education undetermined
- Diploma In progress
- Work experience (years) undetermined
- Written languages undetermined
- Spoken languages undetermined

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Library Report
For the Proposed

Bachelor of Engineering in Artificial Intelligence Engineering
&
Bachelor of Science in Artificial Intelligence

Katharine Hall & Krista Alexander, Associate Librarians

April 28, 2026

Purpose

The purpose of this report is to assess the adequacy of available library resources to support the proposed Bachelor of Engineering in Artificial Intelligence Engineering, and Bachelor of Science in Artificial Intelligence at Concordia University. The report identifies resources and funding required to support the programs.

Summary

The Library can adequately support this new program within its current collections budget.

Concordia programs and comparators

Currently the Faculty offers undergraduate programs in computer science, computer engineering, software engineering and more specialized programs in cybersecurity. There is also a graduate microprogram in applied artificial intelligence. The proposed programs would be delivered through a newly formed unit, Artificial Intelligence Engineering Virtual Unit (AIE), which is a joint initiative of the Department of Electrical and Computer Engineering (ECE), the Concordia Institute for Information Systems Engineering (CIISE), and the Department of Computer Science and Software Engineering (CSSE).

The Steering Committee identified comparator programs at a variety of institutions, including Western University, University of Waterloo and Ontario Tech University. These three universities' collections will be used as comparators throughout this report.

Collections Assessment

A. Monographs

i. Current Collection Growth

For the current fiscal year, 2025/2026, the budget allocations for both CSSE and ECE are $6,300 each (n.b. CIISE is supported under the budget envelope for CSSE). For the previous four complete fiscal years, our budget allocations have been as follows:

Fiscal Year	Allocation for CSSE	Allocation for ECE
2024/2025	$7,000	$7,000
2023/2024	$11,300	$7,900
2022/2023	$12,400	$8,700
2021/2022	$13,500	$11,500

While the recent decrease in budget allocations has impacted the number of monographs that are individually selected, these departments are very well supported through the library's commitment to subscriptions and acquisitions of large ebook packages. The following are packages with relevant content for artificial intelligence:

- Knovel ebooks
- O'Reilly ebooks (formerly Safari Books Online)
- Springer ebooks subcollections:
    - Engineering
    - Computer Science
    - Intelligent Technologies and Robotics
    - Synthesis Digital Library of Engineering and Computer Science

A collection analysis was performed in 4 subject areas that fall within artificial intelligence to determine the average percent growth in area in the past three years at Concordia and the comparator institutions.

	Concordia	Western	Waterloo	OntarioTech
Annual percent growth (3-year average)	12%	9%	13%	10%

ii. Recommendation

Concordia Library has access to relevant ebook content and its annual collection growth in the areas examined is in line with the comparator institutions. The Library can adequately support this new program within its current monograph budget allocation.

B. Journals

i. Current collection

The Library has a substantial collection of electronic journals, which are usually acquired in bundles, either from the publisher or an aggregator. These subscription bundles, generally managed on a national or provincial level by the CRKN consortium of academic libraries or by the Partenariat des bibliothèques universitaires du Québec (PBUQ) in Quebec, include journals relevant to artificial intelligence. They include:

- Elsevier (ScienceDirect)
- Institute of Electrical and Electronics Engineers (IEEE)

- Sage
- Springer-Nature
- Taylor & Francis
- Wiley-Blackwell

ii. Needs assessment

A list of 20 journals in artificial intelligence was compiled and compared to Concordia's current holdings. Those titles where Concordia had no access or where there was an embargo on current access, were prioritized as either high, medium or low priorities. There was one title to which Concordia had a year-long embargo on current access. Although a high priority title, access to the most recent year's articles via interlibrary loan was viewed as being sufficient for the proposed Bachelors degree programs.

iii. Recommendation

The Library's current journal subscriptions and packages are adequate for the needs of the proposed program.

C. Databases

i. Current collection

The Library has many subscriptions to electronic full-text databases and abstract indexes. Those most relevant to artificial intelligence include:

Database name	Database content
ACM Digital Library	Contents published by ACM, covering computer science, information technology, software engineering, networking, wireless communications, and other computing-related subjects.
Compendex (on Engineering Village)	A bibliographic database covering engineering research literature since 1884.
IEEE Xplore	Contents published by IEEE, covering many fields including circuits, communication systems, computer engineering, information theory, robotics, power engineering, signal processing, telecommunications.
Inspec (on Engineering Village)	A bibliographic database covering physics, electrical engineering, electronics and computing.
Inspec Analytics	A research intelligence tool to help research professionals explore global trends in physics, engineering and technology research, released by the IET (Institute of Engineering and Technology).
O'Reilly for Higher Education	A collection of books and video, proven learning paths, case studies, interactive tutorials, reference sources, audio books relating to IT, programming and software engineering.
SPIE Digital Library	A collection of contents in optics and photonics research by the Society of Photo-Optical Instrumentation Engineers.
Web of Science	This multidisciplinary database covers the journal literature of the sciences through the Science Citation Index Expanded, which includes the fields of science and engineering.

ii. Needs assessment

A review of the databases available for Computer Science and Software Engineering at Western University, University of Waterloo and Ontario Tech University was completed. There was 1 database, McGraw-Hill's *AccessEngineering*, that is available at all 3 other institutions and not available at Concordia.

McGraw-Hill's *AccessEngineering* is a general engineering reference source that contains ebooks, handbooks, videos and a data visualization tool. While it contains content relevant to the proposed program, it is not a specialized resource for AI, computer science or software engineering. While held by all three comparator univerisities, it was not judged to be a required subscription for the proposed programs, especially given Concordia's current subscription to *O'Reilly for Higher Education*, which contains similar content.

iii. Recommendation

The Library's current database subscriptions are adequate for the needs of the proposed program.

D. Collections Recommendation Summary

The Library can adequately support this new program within its current collections budget.

Additional Library services

All university libraries in Quebec use the same shared services platform called Sofia, which allows students and faculty from all Quebec university libraries to search, access, request and borrow items from the collections of the 18 partner institutions.

The interlibrary loan service, also integrated in Sofia, provides students and faculty with the ability to request materials that are not available in the Concordia Library collection, including electronic delivery of journal articles. Students and faculty may borrow books in person at other academic libraries in Quebec using their Concordia ID card.

Academic Support

The subject librarian is available to conduct course-specific library workshops, as requested by faculty, and provides help with library research on an individual basis for all students and faculty in the department. A team of professional librarians and trained staff help Concordia students and faculty with their basic information and research questions at the Ask Us Desks, as well as via e-mail and chat.

Conclusion

A careful assessment was made of the library's current monograph, journal, and database holdings and subscriptions to determine the adequacy of available library resources to support the proposed Bachelor of Engineering in Artificial Intelligence Engineering, and Bachelor of Science in Artificial Intelligence at Concordia University. It was determined that the Library can adequately support these new programs within its current collections budget.

Appendix 6: List of external experts who provided detailed feedback in industry survey

Following a data-driven approach, we asked industry experts to complete a comprehensive survey for us, reaching out to about 100 industry experts through our faculty network. The following is the list of industry experts who supported the proposal by providing detailed feedback in the survey. Detailed survey results can be found in Appendix 3.

Name	Current job title	Organization	Sector	Core responsibilities
Zhenglin Xiong	Chief Executive Officer	AEROPORT AI	Software / ICT / AI Products and Services	Executive / Senior management, HR management, Data / AI / ML / Analytics, Product management, Operations
Mehdi Abedinpour Fallah	R&D Principal Specialist, Controls Software Engineering	Pratt & Whitney Canada	Aerospace	Engineering / Development, Research / R&D
Anders Jeppsson	Vice President, Engineering	Syntronic R&D Inc	R&D Design services	Executive / Senior management
Parul Khanna	Vice President, Cybersecurity	BNP Paribas	Finance / Insurance / Fintech	Executive / Senior management, HR management, Engineering / Development, Data / AI / ML / Analytics, Research / R&D, Operations
Tamara Vandersluis	Vice President, Innovation	R2i	Information technology - servers	Executive / Senior management, Consultant
Daniel Ratchford	Vice President and Head of Delivery	Applexus Technologies	Software / ICT / AI Products and Services	Executive / Senior management
Fiona Simpson	Chief Executive Officer	BioMimir Inc.	Medical Devices / Healthcare Technology / Hospitals	Executive / Senior management, Engineering / Development, Research / R&D, Operations
Oz Gurtuna	Founder / Chief Executive Officer	Plumfind	Software / ICT / AI Products and Services	Executive / Senior management, Data / AI / ML / Analytics
Jacques Gauthier	Vice President, Business Development	Upbrella International	Construction / Civil / Infrastructure	Executive / Senior management
Marco de Tavira	Director of Operations, PSS	Laurentide Controls	Robotics / Industrial Automation	Executive / Senior management, Engineering / Development, Operations

Jean-Francois Cantin	Transport Engineer	gbi	Automotive / Transportation / Logistics	Engineering / Development, Research / R&D
Patrick Jean-Baptiste	Security Director	Sunphinx inc.	Specialized Engineering Consulting / R&D Services	Executive / Senior management
Luca Crotti	Consultant	Alfiere Innovation	Specialized Engineering Consulting / R&D Services	Executive / Senior management
Camille Matte	Associate Manager, System Design	Zimmer Biomet	Medical Devices / Healthcare Technology / Hospitals	Engineering / Development, Research / R&D
Naysan Saran	Co-founder and Chief Executive Officer	CANN Forecast	Software / ICT / AI Products and Services	Executive / Senior management, Product management, Research / R&D
Fiona Simpson	Chief Executive Officer	BioMimir Inc.	Medical Devices / Healthcare Technology / Hospitals	Executive / Senior management, Research / R&D
Mike Lee	Chief Executive Officer	Fundica	Finance / Insurance / Fintech	Executive / Senior management
Jean-Samuel Chenard	President	Motsai	Specialized Engineering Consulting / R&D Services	Executive / Senior management

US-2026-3-D10
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: Minor in Artificial Intelligence (GCS-COMP-6001)(the "Minor in AI")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Minor in AI.

BACKGROUND:

The proposed Minor in AI consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor in AI can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts. The new Minor will allow other departments (and other faculties) to take advantage of the Department of Computer Science and Software Engineering's expertise in AI and will contribute to the growing demand for AI talent across industries, supporting Montreal's position as a global hub for AI research and development.

Further details related to the proposed new program are included in the attached documentation. The APC recommended the Minor in AI for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the new Minor in Artificial Intelligence (GCS-COMP-6001), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

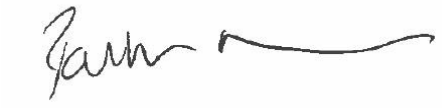
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

Summary and Rationale for Changes

Please see attached proposals.

The proposed Minor in Artificial Intelligence consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor in AI can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

The new Minor will allow other departments (and other faculties) to take advantage of the the CSSE department's expertise in AI and will contribute to the growing demand for Artificial Intelligence (AI) talent across industries, supporting Montreal’s position as a global hub for AI research and development.

Impact of the Proposed Minor in Artificial Intelligence on the Minor in Computer Science

The introduction of the Minor in Artificial Intelligence is not expected to adversely affect the CS Minor. While some students may elect to pursue the Minor in Artificial Intelligence in place of the CS Minor, it is anticipated that the overall enrollment across both minors will exceed the current enrollment in the CS Minor alone.

a) Although a subset of students may choose the Minor in Artificial Intelligence instead of the CS Minor, the latter will continue to appeal to students seeking broader flexibility. The CS Minor provides opportunities for customization aligned with diverse academic interests, including (but not limited to) gaming, computer graphics, programming, and theoretical computer science. As such, the two minors serve complementary, rather than competing, purposes.

b) The Minor in Artificial Intelligence is expected to enhance Concordia’s competitive position and institutional attractiveness. It will provide students from other departments and faculties with the opportunity to supplement their primary field of study with focused expertise in Artificial Intelligence. This interdisciplinary enrichment is likely to strengthen the overall value proposition of their degree programs and may contribute to increased student recruitment and retention.

c) The proposed Minor in Artificial Intelligence is cost-neutral. It will be delivered using existing courses and faculty resources, and no additional budgetary allocations are required for its implementation.

Resource Implications

None. One new course (COMP 332 Foundations for AI) will be taught as part of the normal teaching load of an instructor in the Department.

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission GCS-COMP-6001; APC-2026-3-D11. As a result of discussions, APC resolved that the curriculum proposal be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Feb 2026

The dossier was approved by GCS Council with no modifications requested.
GCS Council document number: ECFC 2026.02.02

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 20 Feb 2026

Approved by:

Otmane Ait Mohamed, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 22 Jan 2026

Summary of Committee Discussion: Department Approval

For Submission to:

Otmane Ait Mohamed, Associate Dean, Academic Programs,
Engineering and Computer Science Undergraduate Studies Committee, 22 Jan 2026

Approved by:

Joey Paquet, Chair, Department of Computer Science and Software Engineering,
CSSE Department Council,, 16 Jan 2026

The dossier was unanimously approved in the CSSE department meeting.

Summary of Changes (New Undergraduate Program (Fast Track))

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Minor in Artificial Intelligence - NEW	★	★	★

Regulation Changes:

- Notes

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Minor in Artificial Intelligence - NEW

Calendar Section Name: Minor in Artificial Intelligence
Calendar Section Type: Defined group
Description of Change: Minor in Artificial Intelligence - NEW

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Sep 2027

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.55 Minor in Artificial Intelligence

Type of Change: New Defined Group

Present Text calendar		Proposed Text
	25 credits	Minor in Artificial Intelligence
0	~~0~~	25 credits: COMP 232 Mathematics for Computer Science (3) COMP 248 Object-Oriented Programming I (3.5) COMP 249 Object-Oriented Programming II (3.5) COMP 332 Foundations for Artificial Intelligence (4) COMP 352 Data Structures and Algorithms (3) COMP 432 Machine Learning (4) COMP 433 Introduction to Deep Learning (4)

Rationale:

See proposal.

Resource Implications:
None.

D1

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Minor in Artificial Intelligence - NEW

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Department of Computer Science and Software Engineering

Calendar publication date: 2027/2028/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.70 Department of Computer Science and Software Engineering > Section 71.70.55 Minor in Artificial Intelligence

Present Text calendar	Proposed Text
	Notes - Approval for adding the Minor in AI will be based on academic performance (an annual / cumulative GPA and grades in relevant subjects). - Students from outside the faculty requesting the Minor in AI must have completed MATH 203, 204 and 205 or equivalent(s) with minimum grade of C-. - Students who require any of the above courses as part of their major should replace these courses with elective courses chosen from the list of Computer Science Electives .

Rationale:
We are adding notes describing the admission requirements and addressing situations where students may have to take one of the courses listed in the Minor as part of their major.

Resource Implications:
None.

D2

Impact Report

March 19, 2026

Dr. Rachel Berger
Vice-Provost of Innovation in Teaching and Learning
Office of the Provost
Concordia University

Re: Support for Minor in Artificial Intelligence

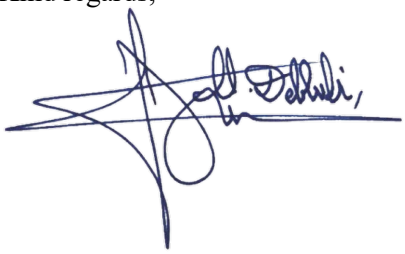
Dear Dr. Berger,

I am writing to express my full support for the proposal of the Department of Computer Science and Software Engineering to establish an undergraduate Minor in Artificial Intelligence within the Gina Cody School of Engineering and Computer Science.

The Minor program is cost-neutral and the Faculty is able to support the program within our current instructional capacity. I confirm that the new course associated with this program, COMP 332 Foundations for Artificial Intelligence, will be offered without increasing the total number of sections delivered by the Faculty.

Thank you for your consideration of this proposal.

Kind regards,



Dr. Mourad Debbabi, Dean and Professor
Gina Cody School of Engineering and Computer Science
Concordia University
1515 St. Catherine St. West, EV002.169,
Montreal, QC, Canada H3G 2W1
Phone: (514) 848-2424 ext. 3062
Email: dean.ginacody@concordia.ca

DATE: February 16, 2026

TO: Dr. Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Minor in Applied Artificial Intelligence

I have conferred with i/Provost Dr. Effrosyni Diamantoudi, and she has confirmed her support for the Major in Applied Artificial Intelligence to be housed in the Department of Computer Science and Software Engineering at the Gina Cody School of Engineering and Computer Science. Congratulations on putting together a timely program that will surely resonate with our students.

We would like for the Faculty to add a justification explaining why the proposed course will not reduce registration or negatively impact the existing Minor in Computer Science. This explanation should demonstrate that the new minor can coexist with current offerings in a way that maintains the integrity and distinct purposes of the two programs.

We note that the program is cost-neutral; the administration will be absorbed within existing roles, and the courses are offered with the regular offerings of the Faculty, including the course that will be added to the Curriculum. A formal letter from you, Dean Debbabi, must be included with the final package to signal support for the program. The required letter should also state that the new course will be offered without increasing the total number of sections delivered by the Faculty.

Please do not hesitate to be in touch for support as you complete these final pieces. We look forward to seeing the program progress through governance and to its eventual offering in 2026-2027.

Sincerely,
RACHEL BERGER
Dr. Rachel Berger

Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, Interim Provost & Vice President Academic
Dr. Otmane Ait Mohamed, Associate Dean, GCS
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

Concordia Proposal for New Programs (Degree programs, certificates and diplomas)

GENERAL INFORMATION

New programs are developed collaboratively between the hosting unit(s), the Departments, the Faculties, the School of Graduate Studies and the Office of the Provost.

Type of credential	Minor
Level of study	Undergraduate
Program name	Minor in Artificial Intelligence
Hosting unit(s)	Department of Computer Science and Software Engineering, Gina Cody School of Engineering and Computer Science
Total credit value	25 credits
Leads	Dr. Joey Paquet, Chair, Department of Computer Science and Software Engineering Dr. Juergen Rilling, Associate Chair, Department of Computer Science and Software Engineering Dr. Peter Rigby, Undergraduate Program Director, Department of Computer Science and Software Engineering
Proposed start date	September 2027
Dean signature	

PROGRAM OVERVIEW

The proposed Minor in Artificial Intelligence consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor in AI can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts. Students in fields such as engineering, biology, psychology, economics, finance, communication, and the humanities can enhance their primary area of study by integrating machine learning and deep learning techniques into domain-specific applications—such as data analysis, automation, modelling, prediction, and intelligent system design. Whether used to support scientific research, improve business decision-making, develop interactive media, or analyze social and behavioral patterns, the minor equips students with versatile computational competencies that strengthen and broaden the impact of their major.

Several leading Canadian institutions have launched AI minors specifically designed to be combined with existing majors, reflecting clear student and industry demand. Notable examples include University of Toronto, McGill University, and University of Alberta.

SOCIETAL NEED, TARGET AUDIENCE, AND ENROLMENT STRATEGY

The Minor will contribute to the growing demand for Artificial Intelligence (AI) talent across industries, supporting Montreal's position as a global hub for AI research and development. Artificial Intelligence (AI) has emerged as one of the most transformative technologies of the 21st century, driving innovation across sectors such as healthcare, finance, manufacturing, transportation, and cybersecurity. The creation of this Minor utilizes expertise within the Department of Computer Science and Software Engineering and contributes to a wider effort within the Gina Cody School to meet the emerging need for AI professionals (this effort includes the recent creation of a Microprogram in Applied Artificial Intelligence for graduate students, the creation of an undergraduate program in AI, and an AI option for both the Computer Science program as well as the Bachelor of Engineering—Software Engineering, all currently being developed).

The program will be open to current Concordia students within or outside the Gina Cody School of Computer Science. Artificial intelligence skills have rapidly shifted from being a niche specialty to a core requirement across many industries. As organizations integrate AI to improve efficiency, automate routine tasks, and make data-driven decisions, employers increasingly expect workers to understand how AI tools operate and how to apply them responsibly. Fields such as healthcare, finance, manufacturing, marketing, transportation, and even education now rely on AI-powered systems for tasks like predictive analytics, process optimization, customer personalization, and intelligent automation. As a result, professionals are expected not only to use AI tools but also to interpret their outputs, collaborate with automated systems, and adapt to continually evolving technologies. This growing dependence on AI has made AI literacy—knowing how these systems work and how to leverage them effectively—a critical skill for staying competitive in today's job market.

Across Canada, both industry demand and learner demand for AI training are accelerating rapidly: Employers are posting record numbers of AI-related jobs, with a 15×increase over a decade. Canadian industries—from finance to healthcare to advanced tech—require specialized AI knowledge. Students and working professionals are seeking AI programs at unprecedented rates. Schools, universities, and government agencies are scaling AI education to meet this need, but shortages persist.

Student recruitment officers within the Gina Cody School will be informed of the Minor and raise awareness about the Minor through existing recruitment activities. No additional recruitment activities are needed to attract new target audiences.

PROGRAM AT THE GRADUATE/UNDERGRADUATE LEVEL

Courses in the Minor will be open to undergraduate students, with coursework at introductory, intermediate and advanced levels appropriate for undergraduate studies. (The Department also offers a Microprogram in Applied Artificial Intelligence at the graduate level.)

ADMISSION REQUIREMENTS

The Department of Computer Science and Software Engineering already delivers a Minor in Computer Science. The admission requirements for the Minor in AI will be the same as for the Minor in Computer Science, i.e.:

- Approval for adding the Minor in AI will be based on academic performance (i.e. an annual / cumulative GPA and grades in relevant subjects).
- Students from outside the faculty requesting the Minor in AI must have completed MATH 203, 204 and 205 or the equivalent(s) with minimum grade of C-.

CURRICULUM

By completing this Minor in AI, students develop a strong foundation in the mathematical principles and programming techniques essential for modern computing, gain proficiency in object-oriented software development, and learn to design and analyze efficient algorithms and data structures. They acquire core competencies in artificial intelligence through an understanding of its foundational models and methods and build applied skills in both classical machine learning and advanced deep learning techniques. By the end of the program, students are equipped to design intelligent systems, implement learning algorithms, reason about computational complexity, and apply AI methods to real-world problem solving across a range of domains.

List of courses:
COMP 232 Mathematics for Computer Science (3 credits)
COMP 248 Object-Oriented Programming I (3.5 credits)
COMP 249 Object-Oriented Programming II (3.5 credits)

COMP 332 Foundations for Artificial Intelligence (4 credits)
COMP 352 Data Structures and Algorithms (3 credits)
COMP 432 Machine Learning (4 credits)
COMP 433 Introduction to Deep Learning (4 credits)

INSTITUTIONAL FIT

The Department of Computer Science and Software Engineering (CSSE) is ideally positioned to host the expected high demand of such a program. All the courses listed in the program are already delivered as multi-section courses as part of the Bachelor of Computer Science programs, as well as the B.Eng. in Software Engineering. One exception is COMP 332 Foundations for Artificial Intelligence, which is now being developed and will be available for delivery in multiple sections as soon as it is approved. (A course proposal is being submitted concurrently in a curriculum change dossier.) Within Concordia, CSSE is ideally positioned at the forefront of both Computer Science, Software Engineering, and Artificial Intelligence.

The Gina Cody School of Engineering and Computer Science is dedicated to the development of programs in Artificial Intelligence both at the graduate and undergraduate studies, as exemplified by the current development of new undergraduate programs in AI.

CONSULTATION & INSTITUTIONAL FIT (200 words)

The new undergraduate minor in Artificial Intelligence will significantly strengthen course offerings by equipping students with highly relevant, future-ready skills that complement a wide range of majors. AI concepts such as data analysis, machine learning are increasingly important across disciplines including business, healthcare, engineering, social sciences, and the arts. Offering an AI minor allows students to enhance their primary field of study without committing to a full major, increasing academic flexibility. Additionally, the minor can attract new students who are eager to engage with cutting-edge technology and improve their career prospects, positioning the institution as innovative, interdisciplinary, and responsive to workforce demand.

ENROLMENT PROJECTIONS AND RESOURCE REQUIREMENTS

Most of the Minor consists of existing courses (COMP 332 Foundations for AI is the one new course, being proposed simultaneously) and there are no resource needs.

The Minor in AI is projected to be as popular as the current minor in Computer Science. Taking numbers from the Minor in CS, over the last 4 years, we have seen 305 students from Arts and Sciences, 229 students from JMSB, 37 from other engineering disciplines, and 31 from Fine Arts, for a total of 602 students. The largest single program is Math and Statistics with 141 students. We will expect a minimum of 150 (600/4) students per year for the Minor in AI and expect it to be higher given the current trend in AI ubiquity.

US-2026-3-D11
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Microprogram in Economic Policy (AS-ECON-6026)(the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The Department of Economics proposes the creation of this Microprogram. The Microprogram will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 Canadian Economic Policy and Institutions, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely.

The proposed audience for the Microprogram includes:

- Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs);
- Employees of non-governmental and community organizations;
- Policy analysts and research assistants in government and think tanks;
- Professionals seeking continuing education in applied economic policy;
- Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Further details related to both are included in the attached documentation. The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Undergraduate Microprogram in Economic Policy (AS-ECON-6026) as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

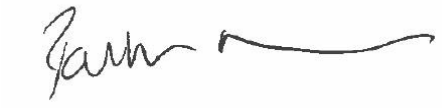
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Undergraduate Program (Fast Track) - AS-ECON-6026 - VERSION : 1

Summary and Rationale for Changes

The Department of Economics proposes the creation of a Microprogram in Economic Policy. The program will use current resources and course offerings, as the department has always offered Economic policy courses.

One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely.

The proposed audience for this microprogram includes:

- Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs)
- Employees of non-governmental and community organizations
- Policy analysts and research assistants in government and think tanks
- Professionals seeking continuing education in applied economic policy
- Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Please refer to the attachment for the comprehensive proposal.

Resource Implications

None. This microprogram is composed of existing courses. One course will be converted to online format. It will be developed by a faculty member as part of their course load.

New Undergraduate Program (Fast Track) - AS-ECON-6026 - VERSION : 1

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission

AS-ECON-6026; APC-2026-3-D1.

As a result of discussions, APC resolved that the curriculum proposals be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports this new program proposal and recommends that it be presented at the next meeting of Arts and Science Faculty Council (ASFC) and Academic Programs Committee (APC).

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 10 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports the changes proposed in this dossier and recommends that it be reviewed at the next meeting of the Arts and Science Faculty Council (ASFC).

The Department of Economics is proposing a Microprogram in Economic Policy. This 12-credit program aims to attract professionals in the private sector and public sectors, including community organizations who wish to understand economic policy frameworks affecting taxation, trade policy, immigration policy and demographic challenges, institutional and international relationships and those requiring skills in government writing.

FCC also acknowledges that there are no resource implications that are related to this proposal.

Summary of Committee Discussion: Department Approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

Approved by:

Jorgen Hansen, Chair, Department of Economics,
Economics Department Council, 18 Mar 2026

The proposal was approved unanimously by the Economics Department Council as of March 18, 2026.

Microprogram in Economic Policy

Program Requirements

Microprogram in Economic Policy (12 credits)

12.0 credits:

- ECON 201 Introduction to Microeconomics (3.00)
- ECON 203 Introduction to Macroeconomics (3.00)
- ECON 318 Canadian Economic Policy and Institutions (3.00)
- ECON 319 International Economic Policy and Institutions (3.00)

Notes

Students are responsible for satisfying their particular program requirements.

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Summary of Changes (New Undergraduate Program (Fast Track))

Regulation Changes:

- Program Requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Economic Policy

Calendar Section Name: Program Requirements
Calendar Section Type: Regulation
Description of Change: Program Requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.080 Department of Economics > Economics Programs > Economics > Microprogram in Economic Policy

Present Text calendar	Proposed Text
	Program Requirements

Rationale:
Standard field applied for program build.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Economic Policy

Calendar Section Name: Microprogram in Economic Policy
Calendar Section Type: Program
Description of Change: Microprogram in Economic Policy New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics
Program Name: Microprogram in Economic Policy
Program Type: Micro Program
Degree: Micro Program

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.080 Department of Economics > Economics Programs > Economics > Microprogram in Economic Policy > Program Requirements

Type of Change: New Program

Present Text calendar	Proposed Text
credits	**12 credits** Microprogram in Economic Policy
0	~~0~~ 12 credits: ECON 201 Introduction to Microeconomics (3) ECON 203 Introduction to Macroeconomics (3) ECON 318 Canadian Economic Policy and Institutions (3) ECON 319 International Economic Policy and Institutions (3)

Rationale:
The proposed microprogram aims to attract professionals in the private sector and public sectors, including community oranizations who wish to understand economic policy frameworks affecting taxation, trade policy, immigration policy and demographic challenges, institutional and international relationships and those requiring skills in government writing.

Resource Implications:
None.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Economic Policy

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Economics

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.080 Department of Economics > Economics Programs > Economics > Microprogram in Economic Policy

Present Text calendar	Proposed Text
	Notes Students are responsible for satisfying their particular program requirements.

Rationale:
Standard field applied for program build.

Resource Implications:
None.

Impact Report

Concordia University
Arts and Science

NEW PROGRAM PROPOSAL EVALUATION FORM

Contents

- Department, Program Type and credit value
- Resources
- Preview
- FAS recommendations/comments

Department: Economics

Program Type: Undergraduate Microprogram

Title & credit value: Microprogram in Economic Policy (12 credits)

Resources:

None. One course will be converted to online format. Development by faculty member as part of course load.

Microprogram in Economic Policy (12 credits)

12 credits:	ECON 201	Introduction to Microeconomics
	ECON 203	Introduction to Macroeconomics
	ECON 318	Canadian Economic Policy and Institutions (PR ECON 201, ECON 203)
	ECON 319	International Economic Policy and Institutions (PR ECON 201, ECON 203)

FAS recommendations/comments :

(move forward to provost approval or return to department)

Richard Courtemanche, Associate Dean	• This is quick, simple microprogram, using existing resources. • Prereqs are accounted for. • The targeted population has been identified – all courses should be available online shortly. • The Canadian/International Economic policies seems well identified as targets… any way to also attract the provincial government learners?
Pascale Sicotte, Dean	Bonjour Richard. I approve. Nothing else to add in the comment section. p. _____ Pascale Sicotte, PhD Dean | Doyenne Faculty of Arts and Science | Faculté des arts et des sciences Professor, Department of Biology |Professeure, Département de Biologie Concordia University | Université Concordia dean.artsci@concordia.ca

Concordia Microprogram Guidelines

Microprograms are short credentials offered at the undergraduate level (9-15 credits) or the graduate level (1-14 credits) and provide an opportunity for Concordia to increase enrolment by targeting expanded audiences of potential students, such as working professionals seeking upskilling or students seeking rapid entry into the job market. The program competencies, design and delivery models must therefore be tailored to meet the needs of the target audience. This guide serves to outline key criteria for success when developing new microprograms:

Identify a clear target audience

Before determining the specific competencies and admission criteria for the microprogram, consider the target audience carefully, in discussion with recruitment advisors in your Faculty. The most successful microprograms identify a defined set of competencies aimed at serving the needs of a specific target audience.

Establish accessible admission pathways

Considering the needs of the target audience, microprograms should offer flexible admission criteria and use a case-by case assessment approach to recognize work experience and offer pathways for students without conventional academic backgrounds. Note that applicants to undergraduate microprograms are not required to provide prior academic records or meet GPA requirements, and they are not required to demonstrate language proficiency prior to their admission as they are for degree programs at Concordia. Departments may review the applications to ensure that students meet the criteria to succeed in the program, but there is no official University standard for entry. This flexibility opens doors for students who demonstrate capacity to succeed in the program, but who may not have followed a traditional academic pathway.

Provide flexible delivery models

Microprograms should be designed to accommodates the needs of the target audience and delivery models should offer flexible options for study, including online or blended models, evening courses, and delivery methods that accommodate the particular learning needs and schedules of the target audience.

Define targeted competencies that demonstrate clear professional value

The competencies developed through the microprogram should be defined in terms of professional relevance and in-demand skills, providing clear career advancement opportunities for students. Competencies should focus on targeted as opposed to broad areas for skill development and should be defined using language easily understood by the target audience. Examples may include areas such as coaching skills, change management and social innovation.

Serve as a standalone credential, while providing credit towards a related programs at Concordia

While microprograms should be designed as standalone credentials, they may also serve as an entry point for students who may later be interested in taking further studies at Concordia. The University's regulations allow for students to transfer credits from completed microprogram to other certificates, diplomas or degrees at Concordia, providing that the program requirements align. It is therefore beneficial to consider if the competencies developed in microprogram align with or complement existing programs at Concordia and discuss opportunities for transfer credits with relevant units.

Note however, that students must meet the full admission requirements if they apply to a degree program at Concordia following the completion of the microprogram. For undergraduate degree programs, students must meet the meet the minimum grade requirement of "C—" to transfer their credits, and must also satisfy the language proficiency requirements set out in Section 13.4 of the Undergraduate Calendar.

Concordia Proposal for Microprograms

MICROPROGRAM GENERAL INFORMATION

New microprograms are developed collaboratively between the hosting unit(s), the Departments, the Faculties, the School of Graduate Studies and the Office of the Provost.

Microprogram Level of study	Undergraduate
Program name	Economic Policy Microprogram
Hosting unit(s)	Department of Economics
Credit transferability	Honours in Economics Specialization in Economics Major in Economics Minor in Economics Minor in Analytical Economics John Molson School of Business ◇ All BComm Students (ECON 210 and ECON 203 are foundation courses) ◇ Economics (BComm Economics Major)
Total credit value	12
Leads	Anthony Noce
Proposed start date	September 2026
Department Chair (name and signature)	Jorgen Hansen 
Dean (name and signature)	Pascale Sicotte

PROGRAM REQUIREMENTS

Please list the required courses for the proposed microprogram here.

Course Code	Course Title	Credit Value
ECON 201	Introduction to Microeconomics	3
ECON 203	Introduction to Macroeconomics	3

ECON 318	Canadian Economic Policy and Institutions	3
ECON 319	International Economic Policy and Institutions	3

TARGET AUDIENCE, ADMISSION REQUIREMENTS, COMPETENCIES IN DEMAND, MARKET RESEARCH AND RECRUITMENT STRATEGY (250 words)

The proposed undergraduate microprogram in Economic Policy is designed for:

- Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs)
- Employees of non-governmental and community organizations
- Policy analysts and research assistants in government and think tanks
- Professionals seeking continuing education in applied economic policy
- Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Concordia University is in close proximity to government bureaucrats and NGOs and policy-oriented organisations. The microprogram specifically targets individuals who engage with public policy and those currently employed within the public administration.

The program is particularly suited to learners anywhere in Canada who wish to understand economic policy frameworks affecting taxation, trade policy, immigration policy and demographic challenges, institutional and international relationships and those requiring skills in government writing.

The four courses required for the microprogram are offered in traditional (evening and day classes), blended, and online formats. The only course not offered fully online, ECON 318, is planned to have an online option in the near future. Thus, the microprogram can be complete entirely online from anywhere in 2 semesters (or 1 semester, if the student has the required prerequisites, ECON 201 and ECON 203).

There is no limit to number of students that can be admitted. There are no microprogram-specific admission criteria.

There have been no discussions with the recruitment officers.

EXPERTISE and CAPACITY OF THE UNIT (150 words)

The Department of Economics has always delivered economic policy courses. However, the policy courses were revised and modernised in 2019. The delivery and evaluation methods are coordinated across all sections and have been updated to address societal challenges and align with Concordia's strategic goals. These policy courses focus on applying theory to real-world issues rather than abstract technical training.

The department's economic policy coordinator, Dr. Anthony Noce, has vast experience in the public sector and developed the policy courses to offer three distinctive features that set them apart and enrich the student's learning experience:
(1) Policy writing component,

(2) Classroom discussion and debates, and
(3) Special guest speakers such as Canadian Senators, former ministers, and directors working in international institutions.

The courses within the microprogram complement programs, as electives, in political science, urban studies, geography, environmental studies, etc., and those in JMSB. Specifically, all the microprogram courses can be used as program credit toward the following degrees or programs:

i. Honours in Economics
ii. Specialization in Economics
iii. Major in Economics
iv. Minor in Economics
v. Minor in Analytical Economics
vi. John Molson School of Business
    (a) All BComm Students (ECON 210 and ECON 203 are foundation courses)
    (b) Economics (BComm Economics Major)

RESOURCE NEEDS (100 words)

No resources required. The development of a fully online version of ECON 318 will be completed by the policy courses coordinator, Dr. Anthony Noce, as part of his regular course load when the online course is offered.

CONSULTATION (100 words)

There is no experiential component.

DATE: March 16, 2026

TO: Dr. Richard Courtemanche, Associate Dean, Academic Programs, FAS

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Economic Policy

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the Microprogram in Economic Policy. We find it to be a timely and well thought-out program, and that the leadership of Prof. Noce bodes well for its success.

We are happy to support this endeavour and extend our support to the Faculty involved and congratulate you on the development of this innovative and important program.

Yours Sincerely,

RACHEL BERGER

Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Pascale Sicotte, Dean, Faculty of Arts and Sciences
Dr. Jorgen Hansen, Chair, Economics
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

US-2026-3-D12
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Microprogram in Computational Physics (AS-PHYS-6010)(the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The Department of Physics is proposing this Microprogram, which aims to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 Numerical Methods in Physics with Python (MATH 204, 205) will be required to complete these prior to enrolling in the course. The prerequisite for PHYS 440 Computational Methods in Physics with Python (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Further details are included in the attached documentation. The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Undergraduate Microprogram in Computational Physics (AS-PHYS-6010), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

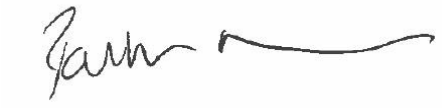
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Undergraduate Program (Fast Track) - AS-PHYS-6010 - VERSION : 2

Summary and Rationale for Changes

The Department of Physics is proposing a new Microprogram in Computational Physics.

The proposed program aims to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering.

The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

The proposal document appears at the end of this dossier.

Resource Implications

None.

New Undergraduate Program (Fast Track) - AS-PHYS-6010 - VERSION : 2

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission

AS-PHYS-6010; APC-2026-3-D2.

As a result of discussions, APC resolved that the following curriculum proposal be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports this new program proposal and recommends that it be presented at the next meeting of Arts and Science Faculty Council (ASFC) and Academic Programs Committee (APC).

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 10 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

This proposed Microprogram in Computational Physics aims to help learners in developing skills and competencies that are not often combined within one program -the scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering.

Summary of Committee Discussion: Department Approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

Approved by:

Valter Zazubovits, Chair, Department of Physics,
Physics Council, 20 Feb 2026

Microprogram in Computational Physics

Program Requirements

Microprogram in Computational Physics (6 credits)

6.0 credits:

- PHYS 236 Numerical Methods in Physics with Python (3.00)
- PHYS 440 Computational Methods in Physics with Python (3.00)

Notes

Students are responsible for satisfying their particular program requirements.

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Summary of Changes (New Undergraduate Program (Fast Track))

Regulation Changes:

- Program Requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Computational Physics

Calendar Section Name: Program Requirements
Calendar Section Type: Regulation
Description of Change: Program Requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Physics

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.230 Department of Physics > Physics Programs > Physics > Microprogram in Computational Physics

Present Text calendar	Proposed Text
	Program Requirements

Rationale:
Standard field applied.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Computational Physics

Calendar Section Name: Microprogram in Computational Physics
Calendar Section Type: Program
Description of Change: Microprogram in Computational Physics
New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Physics
Program Name: Microprogram in Computational Physics
Program Type: Micro Program
Degree: Micro Program

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.230 Department of Physics > Physics Programs > Physics > Microprogram in Computational Physics > Program Requirements

Type of Change: New Program

Present Text calendar	**Proposed Text**
credits	**6 credits** Microprogram in Computational Physics
0	~~0~~ 6 credits: PHYS 236 Numerical Methods in Physics with Python (3) PHYS 440 Computational Methods in Physics with Python (3)

Rationale:

The proposed program aims to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering.

Resource Implications:
None.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Computational Physics

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Physics

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.230 Department of Physics > Physics Programs > Physics > Microprogram in Computational Physics

Present Text calendar	Proposed Text
	Notes Students are responsible for satisfying their particular program requirements.

Rationale:
Standard field and text applied.

Resource Implications:
None.

Impact Report

Concordia University
Arts and Science

NEW PROGRAM PROPOSAL EVALUATION FORM

Contents

- Department, Program Type and credit value
- Resources
- Preview
- FAS recommendations/comments

Department: **Physics**

Program Type: **Microprogram**

Title & credit value: **Microprogram in Computational Physics** (6 credits)

Resources: **None.**

Preview:

Microprogram in Computational Physics

PHYS 236 Numerical Methods in Physics with Python (3 credits)
PHYS 440 Computational Methods in Physics with Python (3 credits)

FAS recommendations/comments:
(move forward to provost approval or return to department)

Richard Courtemanche, Associate Dean	• This is an interesting short program to attract students. • Basis of entry = CEGEP Science ○ But now, CEGEP Science has some programming… do they pick up where CEGEP left off? • From Section 16.2.4.7 - Microprograms *An undergraduate microprogram is a coherent program, usually of 9-15 credits, made up of regular undergraduate courses. A microprogram is normally completed within one or two academic terms.* → the form itself says 1-15 credits (?!) - this would mean that 6 credits could pass. • Their potential target audience is so-so [undergrads in other disc – they can't; people on workforce – ok; Certificate Sci Found Stud – maybe…] • The interdisciplinary interest of PHYS 236 and PHYS 440 should be banked on, though. • It's a yes, with a recommendation to talk to MATH, BIOL, and PSYC.

Pascale Sicotte, Dean	6-cr is ok. Agree with AD Courtemanche that development of this program should be shared with other relevant unit earlier as opposed to later, as it may complement other offerings in development. Faculty's responsibility rather than departmental responsibility, probably. Not clear the target audience would be large, but no cost associated with packaging the courses as such.

Concordia Microprogram Guidelines

Microprograms are short-term credentials that can be offered at the undergraduate level (1-15 credits) or the graduate level (1-14 credits) and provide an opportunity for Concordia to increase enrolment by targeting expanded audiences of potential students, such as working professionals and students seeking rapid entry into the job market. The program competencies, design and delivery models must therefore be tailored to meet the needs of the target audience. This guide serves to outline key criteria for success when developing new microprograms:

Identify a clear target audience

Before determining the specific competencies and admission criteria for the microprogram, consider the target audience carefully, in discussion with recruitment advisors in your Faculty. The most successful microprograms identify a defined set of competencies aimed at serving the needs of a specific target audience.

Establish accessible admission pathways

Considering the needs of the target audience, microprograms should offer flexible admission criteria and use a case-by case assessment approach to recognize work experience and offer pathways for students without conventional academic backgrounds. Depending on the target audience, admission standards may include varying levels of high school and post-secondary education alongside work experience, opening doors for students who demonstrate capacity to succeed in the program, but who may not have followed a traditional academic pathway.

Provide flexible delivery models

Microprograms should be designed to accommodates the needs of the target audience and delivery models should offer flexible options for study, including online or blended models, evening courses, and delivery methods that accommodate the particular learning needs and schedules of the target audience.

Offer targeted competencies that demonstrate clear professional value

The competencies developed through the microprogram should be defined in terms of professional relevance and in-demand skills, providing clear career advancement opportunities for students. Competencies should focus on targeted as opposed to broad areas for skill development and should be defined using language easily understood by the target audience. Examples may include areas such as coaching skills, change management and social innovation.

Serve as a standalone credential, while providing credit towards a related programs at Concordia

While microprograms should be designed as standalone credentials, they may also serve as an entry point for students who may later be interested in taking further studies at Concordia. The University's regulations allow for students to transfer credits from completed microprogram to other certificates, diplomas or degrees at Concordia, providing that the program requirements align. It is therefore beneficial to consider if the competencies developed in microprogram align with or complement existing programs at Concordia and discuss opportunities for stackable models and transfer credits with relevant units.

Concordia Proposal for Microprograms

MICROPROGRAM GENERAL INFORMATION

New microprograms are developed collaboratively between the hosting unit(s), the Departments, the Faculties, the School of Graduate Studies and the Office of the Provost.

Microprogram Level of study	Undergraduate
Program name	Microprogram in Computational Physics
Hosting unit(s)	Department of Physics
Stackability	The courses in this program could count towards BSc in Physics or as electives in other science and engineering programs.
Total credit value	6
Leads	Re Mansbach, Valter Zazubovits (both Physics)
Proposed start date	Can start from Winter 2027 (built from existing courses; the first course in the sequence starts in winter)
Dean signature	

TARGET AUDIENCE, ADMISSION REQUIREMENTS, COMPETENCIES IN DEMAND, MARKET RESEARCH AND RECRUITMENT STRATEGY (250 words)

We are proposing a microprogram in Computational Physics. This microprogram aims to help learners in developing skills and competencies that are not often combined within one program - the scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. Although the program is based in Physics, it is in fact interdisciplinary, as it is built from existing courses that are part of the Biophysics program, are taught by biophysics faculty and already contain topics crossing over into biology and chemistry.

The program is built of existing Physics program courses on numerical methods /computations (PHYS 236, PHYS440) that are offered once per year, every year. The second course in the series has a particularly strong experiential component, consisting of a semester-long hands' on group project in which the students either develop a computational model of a real-world system or employ an existing tool to perform a short computational experiment of a system they find interesting. Students will also engage in hands' on in-class exercises. The course features flexible delivery—prerecorded lectures and uploaded exercises with solutions available after the course has occurred.

Computers, including “AI” helpers, are becoming more and more omnipresent in the workplace; however, undergraduate and professional education has not necessarily kept up, leaving both students and current members of the workforce without competencies that they require: in specific, an ability to think critically about how computer programs work, what their limitations are, and how far they can be trusted or relied on. This program will approach this growing skill gap by marrying the scientific approach to problem-solving with quantitative scientific knowledge and practical programming experience, with a substantial emphasis on how these areas of knowledge can empower employees with the ability to use tools more skillfully and without overreliance on them. The course will focus on specific problems and methods that are particularly relevant in science and engineering. Acquiring these competencies will armor learners against replacement by AI and permit them to take a stance on the appropriate and safe deployment of computational tools in their workforce.

The three key competencies that this program helps to develop are

- Systematic quantitative approach to science problems
- Knowledge of the strengths, limitations, and appropriate use cases of widely used computational tools and algorithms
- Programming skills and best practices in scientific computing (focusing on python, a popular programming language).

There are several types of learners that may be interested in this program.

- Undergraduate students in other disciplines who specifically aim at increasing their scientific programming competencies and experience in evaluating and using computational tools related to science and engineering (which are a fairly different set of competencies compared to what may be provided by more generic microprograms in computer science).
- People already in the workforce who would like to increase the above competencies and who need a stronger background in understanding when to employ a variety of computational tools, including AI-based tools
- Students taking Certificate in Science Foundations and willing to expand this experience into the computational / programming realm. In case such student ever decide to join the Physics programs, those courses will be counted towards it.
- Beginner independent students exploring if quantitative science is a good fit for them, while gaining some practical skills.

The latter two scenarios have some Undergraduate recruitment flavor.

It is not clear if anybody is offering similar microprograms. There are MSc/MA degrees in computational science at McMaster & Laurentian U – but no diploma/certificate. Concordia has a Graduate Diploma in Computer Science and a BA program in Data Science.

So far there were no discussions with recruiters.
We will likely start from just several students per year and hope to gradually increase the enrollments as the program becomes better known.

Accessing program requires either CEGEP science or engineering profile or relevant work experience.

This program is built from the existing courses of the Physics undergraduate program. Based on the current statistics, these courses are quite popular among non-physics students, with non-Physics students comprising 26% in PHYS 236 and 50% in PHYS 440. Thus, these topics attract a broad and diverse audience, not narrowly from Physics.

EXPERTISE and CAPACITY OF THE UNIT (150 words)

The program consists of the existing PHYS courses and therefore existing faculty members in Physics (Drs. Helfield, Mansbach and alternatively – Grova, Maiti, Zazubovits) are qualified to teach. No development of new competencies is required apart from faculty keeping themselves aware of the developments in the field.
The courses in this program could count towards BSc in Physics and towards electives in other science and engineering programs.

RESOURCE NEEDS (100 words)

This microprogram consists of existing courses within Physics undergraduate program, namely PHYS 236 and PHYS 440.
There are no new resource needs in the beginning as we will likely start from just several students per year and hope to gradually increase the enrollments as the program becomes better known. Eventually we may need more access to more computer lab room for PHYS440 (currently CC203 is used).

CONSULTATION (100 words)

So far no discussions have occurred outside of the Physics Department.

DATE: March 30, 2026

TO: Richard Courtemanche, Associate Dean, Academic Programs and Development, FAS

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Computational Physics

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the proposed Microprogram in Computational Physics. We are very pleased to see a microprogram emerge that makes use of already-scheduled courses and poses no resources for the department, and we appreciate attempts to create the curriculum in an accessible to the community. We appreciate the efforts made by the department to mobilize current expertise into new offerings.

Our strong recommendation moving forward is to work with a curriculum developer on a market survey and benchmarking; this is not necessary to pursue before putting the dossier through governance, but to direct the marketing and recruitment for the program upon approval. While you have a sense of a market for the program, we would like to work with you to define it more precisely and communicate the new of your new Microporgram effectively.

Yours Sincerely,



Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Pascale Sicotte, Dean, Faculty of Arts and Sciences
Dr. Valter Zazubovits, Chair, Physics
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

US-2026-3-D13
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Microprogram in Religious, Cultural and Ethnic Literacy (AS-RELI-6011) (the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The Department of Religions and Cultures is proposing this Microprogram, which aims to leverage the existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of the offered courses as professional advancement.

The courses offered examine the approaches of multiple cultures and groups toward specific issues. Once the Microprogram is in existence, the aim is to create partnerships with organizations through which professionals in specific industries may be recruited to register in the Microprogram. Special interest has been taken in the area of healthcare , but this Microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

As with all of our programs, the aim will be to refine and develop the Microprogram over time. An introductory course will be developed with the goal of turning it into a popular online course for undergraduates as well that teaches critical skills in cultural diversity.

Further details are included in the attached documentation. The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Undergraduate Microprogram in in Religious, Cultural and Ethnic Literacy (AS-RELI-6011), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

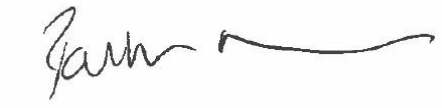
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Undergraduate Program (Fast Track) - AS-RELI-6011 - VERSION : 1

Summary and Rationale for Changes

The Department of Religions and Cultures is proposing a Microprogram in Religious, Cultural, and Ethnic Literacy.

The proposed microprogram aims to leverage our existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. The offered courses look at the approaches of multiple cultures and groups toward specific issues. Once the microprogram is in existence, we will aim to create partnerships with organizations through which we hope to recruit professionals in specific industries to register in the microprogram. We have taken a special interest in healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

As with all of our programs, we aim to refine it and develop it over time. We will develop an introductory course that we aim to turn into a popular online course for undergraduates as well that teaches critical skills in cultural diversity.

The proposal document appears at the end of this dossier.

Resource Implications

None. This microprogram contains existing courses.

New Undergraduate Program (Fast Track) - AS-RELI-6011 - VERSION : 1

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission

Department of Religions and Cultures AS-RELI-6011; APC-2026-3-D3.

As a result of discussions, APC resolved that the curriculum proposal be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports this new program proposal and recommends that it be presented at the next meeting of Arts and Science Faculty Council (ASFC) and Academic Programs Committee (APC).

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 10 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports the changes proposed in this dossier and recommends that it be reviewed at the next meeting of the Arts and Science Faculty Council (ASFC).

The Department of Religions and Cultures is proposing a Microprogram in Religious, Cultural, and Ethnic Literacy. This nine-credit program aims to draw in professionals whose work is public-facing who will benefit from taking selected courses touching wide-ranging cultural and religious themes in the Department of Religions and Cultures as professional advancement.

FCC also acknowledges that there are no resource implications that are related to this proposal.

Summary of Committee Discussion: Department Approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

Approved by:

Naftali Cohn, Chair, Department of Religions and Cultures,
Religions and Cultures department meeting, 09 Feb 2026

Microprogram in Religious, Cultural, and Ethnic Literacy

Program Requirements

Microprogram in Religious, Cultural, and Ethnic Literacy (9 credits)

9.0 credits chosen from:

- RELI 210 Religion in Practice (3.00)
- RELI 312 Justice and Social Conflict in a Globalized World (3.00)
- RELI 355 Religion and Violence (3.00)
- RELI 378 Death and Dying (3.00)
- RELI 3890 Queer Spiritualities (3.00)

Notes

Students are responsible for satisfying their particular program requirements.

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Summary of Changes (New Undergraduate Program (Fast Track))

Regulation Changes:

- Program Requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2026-27 New Microprogram in Religious, Cultural, and Ethnic Literacy

Calendar Section Name: Program Requirements
Calendar Section Type: Regulation
Description of Change: Program Requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Religions and Cultures

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.270 Department of Religions and Cultures > Religions and Cultures Programs > Religions and Cultures > Microprogram in Religious, Cultural, and Ethnic Literacy

Present Text calendar	Proposed Text
	Program Requirements

Rationale:
Standard field applied.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2026-27 New Microprogram in Religious, Cultural, and Ethnic Literacy

Calendar Section Name: Microprogram in Religious, Cultural, and Ethnic Literacy
Calendar Section Type: Program
Description of Change: Microprogram in Religious, Cultural, and Ethnic Literacy New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Religions and Cultures
Program Name: Microprogram in Religious, Cultural, and Ethnic Literacy
Program Type: Micro Program
Degree: Micro Program

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.270 Department of Religions and Cultures > Religions and Cultures Programs > Religions and Cultures > Microprogram in Religious, Cultural, and Ethnic Literacy > Program Requirements

Type of Change: New Program

Present Text calendar	Proposed Text
credits	**9 credits** Microprogram in Religious, Cultural, and Ethnic Literacy
0	~~0~~ 9 credits chosen from: RELI 210 Religion in Practice (3) RELI 312 Justice and Social Conflict in a Globalized World (3) RELI 355 Religion and Violence (3) RELI 378 Death and Dying (3) RELI 3890 Queer Spiritualities (3)

Rationale:
The proposed microprogram aims to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement.

Resource Implications:
None.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2026-27 New Microprogram in Religious, Cultural, and Ethnic Literacy

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Religions and Cultures

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.270 Department of Religions and Cultures > Religions and Cultures Programs > Religions and Cultures > Microprogram in Religious, Cultural, and Ethnic Literacy

Present Text calendar	Proposed Text
	Notes Students are responsible for satisfying their particular program requirements.

Rationale:
Standard field and text applied.

Resource Implications:
None.

Impact Report

Concordia University
Arts and Science

NEW PROGRAM PROPOSAL EVALUATION FORM

Contents

- Department, Program Type and credit value
- Resources
- Preview
- FAS recommendations/comments

Department: RELI
Program Type: Microprogram
Title & credit value: Microprogram in Religious, Cultural, and Ethnic Literacy

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Resources:

No new resource.

Microprogram in Religious, Cultural, and Ethnic Literacy (9 cr)

Electives – 9 cr

Nb	Title	credits
RELI 378	Death and Dying (Summer)	9
RELI 312	Justice (Fall/Winter)	
RELI 355	Religion and Violence (Winter)	
RELI 3890	Queer Spiritualities (Winter)	
RELI 210	Religion in Practice (Summer)	

Total 9 credits for the microprogram.

FAS recommendations/comments :

(move forward to Provost approval or return to department)

Richard Courtemanche, Associate Dean	• This is quick, simple microprogram, using existing resources. • They have thought of ways to try to attract the intended professionals. • Further ties with community/promotion is likely to yield even better results. • No prereqs that could provide interference in the list.
Pascale Sicotte, Dean	Great - send it to Rachel/Faye.

Religions and Cultures Proposal for Microprograms 1 (Feb 2026)

Microprogram Level of study	Undergraduate
Program name	Microprogram in Religious, Cultural, and Ethnic Literacy
Hosting unit(s)	Religions and Cultures
Stackability	Stack into a BA Major in Religions and Cultures. If this finds success, we could create a stackable 9-credit Applied/Practice Microprogram focused on workplace readiness and demonstrable cultural competence.
Total credit value	9 credits
Leads	Naftali Cohn, Sowparnika Balaswaminathan, and Marcel Parent
Proposed start date	September 2026 (students can start Fall, Winter, or Summer)
Dean signature	

TARGET AUDIENCE, ADMISSION REQUIREMENTS, COMPETENCIES IN DEMAND, MARKET RESEARCH AND RECRUITMENT STRATEGY (250 words)

The target audience for this microprogram is professionals who are public-facing and can benefit in their professional lives from our courses that look at the approaches of multiple cultures and groups toward specific issues. We have taken a special interest in healthcare professionals and have done some rudimentary research on professional development in these fields. This should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty & student-services staff.

Given that this is a fairly academic program compared to other professional development opportunities, we are targeting a small segment of these professional industries who would be interested in the opportunity to have a small foray into the academic environment, and to “go back to school” even as they continue to work full time.

We aim for a modest cohort of 5 students per year, but will probably begin with one smaller than that, especially as we launch this without significant market research and without partnerships in place. We have capacity in our Unit and this is an opportunity to use it.

Courses in the Microprogram (choose 3):
RELI 378 Death and Dying (Summer)
RELI 312 Justice (Fall/Winter)
RELI 355 Religion and Violence (Winter)

RELI 3890 Queer Spiritualities (Winter)
RELI 210 Religion in Practice (Summer)

This will be the initial stage of the development of the program. It will also involve some small changes in the pedagogy of certain courses, especially around shifting slightly away from theory toward practical applications and in the nature of some assessments. In Summer 2027, we intend to develop a course on Cultural Diversity. This will be a summer course, and will be a required course for the microprogram, and then the number of electives will be reduced to two (6 credits). The initial iteration will be an in-person intensive, with the goal to turn it into an online course that can reach many students, including part-time students.

Program Learning Objectives:
By the end of the program, students should be able to:

- Understand the variety and depth of religious, spiritual, ethnic, and cultural expressions across contemporary societies worldwide, with particular attention to traditions and perspectives rooted outside Euro-Atlantic frameworks (including Indigenous, African, Asian, Latin American, Middle Eastern, and diasporic communities).
- Develop capacity for reflexive, self-critical analysis of one's own presuppositions, biases, and positionality in relation to course material and professional practice.
- Acquire an understanding of historical and contemporary experiences related to heightened emotions and conflict, and perspectives on how these intersect with ethnicity, class, gender, and colonial histories.
- Apply **social-scientific and comparative methodologies** to study culturally sensitive topics, including religious practice, ritual, violence, death, and responses to social conflict.

The following breakdown of cultural competency as a set of Knowledge, Skills, and Values—identified as in demand by industry based on web research and available articles online—was developed by Dalia Radwan, of the CTL.

Knowledge	Skills	Values
1. **Cultural Awareness** (e.g., Understanding cultural differences in values, beliefs, and practices; the histories, traditions, and contributions of various cultural groups.) 2. **Cultural Norms and Practices** (e.g., recognizing how cultural context affects behavior and communication (e.g., eye contact, greetings, decision-making processes).) 3. **Social Justice and Equity** (e,g., awareness of systemic inequalities and historical contexts that affect marginalized groups and the	1. **Communication Skills** (e.g., ability to engage in open and respectful dialogues with individuals from diverse backgrounds, listening skills, non-verbal communication awareness, including body language and gestures across cultures). 2. **Interpersonal Skills** (e.g., building relationships across cultural boundaries, empathy and managing and resolving conflicts in culturally sensitive ways.) 3. **Adaptability** (e.g., flexibility in interacting with people from	Respect; inclusivity; empathy; critical Self-Reflection and Lifelong Learning.

principles of diversity, equity, and inclusion, including how they relate to power dynamics in society.) 4. **Global Perspectives** (e.g., knowledge of international cultures and global issues that influence social interactions.)	different cultural contexts, and adjusting behavior and communication style as needed.) 4. **Critical Thinking** (e.g., analyzing cultural perspectives, evaluating one's own biases and assumptions and understanding their influence on interactions.) 5. **Problem-Solving** (e.g., **n**avigating cultural differences and barriers to find common ground and solutions.)

Comparators:
The Universite Laval has two relevant microprograms: in Religious Studies – Knowledge of Religions; in the Department of Anthropology—Cultural Diversity. The latter is in the Department of Anthropology. Our program will be in English, and it focuses more on the latter topic, but more from the perspective of the field of religious studies.

Work is needed to establish actual market demand and to establish accreditation for professional development and partnerships. We have been informed that a market analysis is not required for microprograms and that resources for this work are limited. However, if additional resources become available, we would appreciate support for conducting a market analysis. With additional market research, we are confident this would be perceived as a valuable accreditation by recruiters of the various industries mentioned above. Currently, this is an initial experiment based on very preliminary research.

Accommodating full-time professionals:
The courses selected will be offered in the late afternoon and evening. Some of the courses have a hybrid option, and we are actively working to expand this hybrid option to all the relevant courses.

Admission criteria:
A DEC for Quebec students, and a high school diploma for non-Quebec students.

EXPERTISE and CAPACITY OF THE UNIT (150 words)

This stems fully from our expertise, and we have capacity for program students and space in our service courses for program students. We would like the microprogram to be stackable into a regular BA Major.

RESOURCE NEEDS (100 words)

No additional resource needs. However, market research, marketing support, and support creating connections would be beneficial.

CONSULTATION (100 words)

None.

DATE: March 6, 2025

TO: Richard Courtemanche, Associate Dean, Academic Programs and Development, FAS

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Religious, Cultural, and Ethnic Literacy

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the proposed : Microprogram in Religious, Cultural, and Ethnic Literacy. We are very pleased to see a microprogram emerge that makes use of already-scheduled courses and poses no resources for the department, and we appreciate attempts to create curriculum accessible to the community.

Our recommendation moving forward is to use the market research, mapping and benchmarking submitted to build a strong plan for recruitment; we are very interested to see the sorts of new learners this program might bring to the University and would love to support you in making plans for outreach.

Deleted: ,

Yours Sincerely,

RACHEL BERGER

Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Pascale Sicotte, Dean, Faculty of Arts and Sciences
Dr. Naftali Cohn, Chair, RELI
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

US-2026-3-D14
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Microprogram in Jewish Studies (AS-RELI-6012)(the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The Department of Religions and Cultures proposes this Microprogram, which aims to leverage existing courses - and existing departmental strength - in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of Concordia's faculty in the area.

Marketing and recruitment will be done through existing Jewish institutions, primarily the Cummings Centre, which does programming for Jewish seniors, and other Jewish community institutions. Faculty members teaching this course will make use of their own networks to undertake additional recruitment.

Further details are included in the attached documentation. The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Undergraduate Microprogram in Jewish Studies (AS-RELI-6012), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

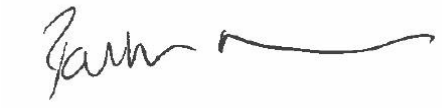
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Undergraduate Program (Fast Track) - AS-RELI-6012 - VERSION : 1

Summary and Rationale for Changes

The Department of Religions and Cultures proposes a Microprogram in Jewish Studies.

The proposed microprogram aims to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. Our target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Marketing and recruitment will be done through existing Jewish institutions, primarily the Cummings Centre, that does programming for Jewish seniors, and other Jewish community institutions. Faculty members teaching this courses will make use of their own networks to undertake additional recruitment.

The proposal document appears at the end of this dossier.

Resource Implications

None. This microprogram contains existing courses.

New Undergraduate Program (Fast Track) - AS-RELI-6012 - VERSION : 1

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 Apr 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission AS-RELI-6012; APC-2026-3-D4.

As a result of discussions, APC approved the dossier with minor changes and resolved that the following curriculum proposals be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports this new program proposal and recommends that it be presented at the next meeting of Arts and Science Faculty Council (ASFC) and Academic Programs Committee (APC).

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 10 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports the changes proposed in this dossier and recommends that it be reviewed at the next meeting of the Arts and Science Faculty Council (ASFC).

The Department of Religions and Cultures is proposing a Microprogram in Jewish Studies. This nine-credit program aims to leverage existing courses in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of faculty members in the area.

FCC also acknowledges that there are no resource implications that are related to this proposal.

Summary of Committee Discussion: Department Approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

Approved by:

Naftali Cohn, Chair, Department of Religions and Cultures,
Religions and Cultures department meeting, 09 Feb 2026

Microprogram in Jewish Studies

Program Requirements

Microprogram in Jewish Studies (9 credits)

9.0 credits chosen from:

- RELI 220 Introduction to Judaism (3.00)
- RELI 230 Judaism and Popular Culture (3.00)
- RELI 235 The Holocaust (3.00)
- RELI 328 Modern Judaism (3.00)
- RELI 331 Literature and the Holocaust (3.00)
- RELI 366 Religion and Music (3.00)

Notes

Students are responsible for satisfying their particular program requirements.

© Concordia University

Summary of Changes (New Undergraduate Program (Fast Track))

Regulation Changes:

- Program Requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2026-27_Microprogram in Jewish Studies

Calendar Section Name: Program Requirements
Calendar Section Type: Regulation
Description of Change: Program Requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Religions and Cultures

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.270 Department of Religions and Cultures > Religions and Cultures Programs > Judaic Studies > Microprogram in Jewish Studies

Present Text calendar	Proposed Text
	Program Requirements

Rationale:
Standard field inserted.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2026-27_Microprogram in Jewish Studies

Calendar Section Name: Microprogram in Jewish Studies
Calendar Section Type: Program
Description of Change: Microprogram in Jewish Studies New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Religions and Cultures
Program Name: Microprogram in Jewish Studies
Program Type: Micro Program
Degree: Micro Program

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.270 Department of Religions and Cultures > Religions and Cultures Programs > Judaic Studies > Microprogram in Jewish Studies > Program Requirements

Type of Change: New Program

Present Text calendar	**Proposed Text**
credits	**9 credits** Microprogram in Jewish Studies
0	~~0~~ 9 credits chosen from: RELI 220 Introduction to Judaism (3) RELI 230 Judaism and Popular Culture (3) RELI 235 The Holocaust (3) RELI 328 Modern Judaism (3) RELI 331 Literature and the Holocaust (3) RELI 366 Religion and Music (3)

Rationale:
The proposed microprogram aims to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies.

Resource Implications:
None.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2026-27_Microprogram in Jewish Studies

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Religions and Cultures

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.270 Department of Religions and Cultures > Religions and Cultures Programs > Judaic Studies > Microprogram in Jewish Studies

Present Text calendar	Proposed Text
	Notes Students are responsible for satisfying their particular program requirements.

Rationale:
Standard field and text inserted.

Resource Implications:
None.

Impact Report

Concordia University
Arts and Science

NEW PROGRAM PROPOSAL EVALUATION FORM

Contents

- Department, Program Type and credit value
- Resources
- Preview
- FAS recommendations/comments

Department: RELI
Program Type: Microprogram
Title & credit value: Microprogram in Jewish Studies

Resources:

No new resource.

Microprogram in Jewish Studies (9 cr)

Electives – 9 cr

Nb	Title	credits
RELI 220	Introduction to Judaism (Fall)	9
RELI 230	Judaism and Popular Culture (Fall 2026)	
RELI 328	Modern Judaism (Fall 2027)	
RELI 331	Literature of the Holocaust (Fall 2027)	
RELI 235	The Holocaust (Winter)	
RELI 366	Religion and Music (Winter 2027)	
RELI 498	The Talmud (Winter 2027)	

Total 9 credits for the microprogram.

RELI 498 should be removed – it's a topics course. It can be counted for the Microprogram by the UPD, if a case arises.

FAS recommendations/comments :

(move forward to Provost approval or return to department)

Richard Courtemanche, Associate Dean	• This is quick, simple microprogram, using existing resources. • The 498 course should be removed. • No prereqs that could provide interference in the list.
Pascale Sicotte, Dean	Great, with these changes – send it to Rachel/Faye.

DATE: March 6, 2025

TO: Richard Courtemanche, Associate Dean, Academic Programs and Development, FAS

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Jewish Studies

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the proposed Microprogram in Jewish Studies. We are very pleased to see a microprogram emerge that makes use of already-scheduled courses and poses no resources for the department, and we appreciate attempts to create the curriculum in an accessible to the community. We appreciate the efforts made by the department to mobilize current expertise into new offerings.

We have two concerns. The first is that the designation of admissions criteria is out of step with those usually used for microprograms, which are stated in the Calendar; our suggestion is merely to drop the criteria from the proposal completely as it is redundant. We also agree, in line with your comments on the proposal, that RELI 498 be dropped as it is a slot course; we feel there are more than enough options to choose from to ensure a meaningful experience.

Our strong recommendation moving forward is to work with a curriculum developer on a market survey and benchmarking; this is not necessary to pursue before putting the dossier through governance, but to direct the marketing and recruitment for the program upon approval.

Yours Sincerely,

RACHEL BERGER

Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Pascale Sicotte, Dean, Faculty of Arts and Sciences
Dr. Naftali Cohn, Chair, RELI
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

Religions and Cultures Proposal for Microprograms 1 (Feb 2026)

Microprogram Level of study	Undergraduate
Program name	Microprogram in Jewish Studies
Hosting unit(s)	Religions and Cultures
Stackability	Stack into a BA Major in Judaic Studies or Religions and Cultures. Stack with an advanced Jewish Studies Microprogram or with one of the other microprograms to add a cultural diversity element.
Total credit value	9 credits
Leads	Naftali Cohn
Proposed start date	September 2026 (students can start Fall, Winter, or Summer)
Dean signature	

TARGET AUDIENCE, ADMISSION REQUIREMENTS, COMPETENCIES IN DEMAND, MARKET RESEARCH AND RECRUITMENT STRATEGY (250 words)

The target audience for this microprogram is Jewish adults. Initially, we are targeting Jewish seniors through a partnership with the Cummings Centre of Montreal (initial contact established), and intend to expand through a partnership with other Jewish community institutions.

Seniors can now audit courses. However, there are also retired people
who go back to do another degree. We see this as a stepping stone to a degree. Further, we believe there will be a small audience interested in a structured program.

Courses in the Microprogram (choose 3):
RELI 220 Introduction to Judaism (Fall)
RELI 230 Judaism and Popular Culture (Fall 2026)
RELI 328 Modern Judaism (Fall 2027)
RELI 331 Literature of the Holocaust (Fall 2027)
RELI 235 The Holocaust (Winter)
RELI 366 Religion and Music (Winter 2027)
RELI 498 The Talmud (Winter 2027)

Additional calendar courses to be offered in future years will also be included.

Program Learning Objectives:

By the end of the program, students should be able to:

- Understand the variety manifestations of Jewish culture, practice, community, literature, and history.
- Develop textual and historical interpretation skills.

Comparators:
The Universite of Ottawa has a microprogram in Jewish Studies. Our program draws on our strength and expertise of the full time faculty in Judaism. Its focus is unique. It will begin with an emphasis on seniors, and creating some kind of feeling of community.

Admission criteria:
A DEC for Quebec students, and a high school diploma for non-Quebec students. Evidence of a BA or similar degree will be acceptable.

EXPERTISE and CAPACITY OF THE UNIT (150 words)

This stems fully from our expertise, as we currently have three full-time and one part-time faculty member who specialize in the study of Judaism. One of the faculty will be retiring, but that still leaves us with great strength. The two full-time faculty who will be remaining have strong ties to the Jewish community and extensively give classes, talks, and performances, often on a voluntary basis.

RESOURCE NEEDS (100 words)

No additional resource needs.

CONSULTATION (100 words)

None.

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Program: Minor in Physics (AS-PHYS-5511)

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Minor in Physics.

BACKGROUND:

The Department of Physics is creating a Minor in Physics aimed at students whose primary program is in Mathematics, Chemistry, Biochemistry, Biology, or Psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent, namely:

- 3 credits in BIOL 201
- 6 credits in CHEM 205, CHEM 206
- 6 credits in MATH 203, MATH 205
- 12 credits in PHYS 204, PHYS 205, PHYS 206, PHYS 224, PHYS 225, PHYS 226
- 3 credits in MATH 204

As this Minor is built from the existing Physics courses (in order to have no/minimal resource implications), it has inherited both the admission requirements and the prerequisite relationships between the courses. Diluting these requirements is not feasible from a pedagogical standpoint (students without proper background will be severely disadvantaged) and it would be unfair to Physics Major and Specializations programs students who have to follow the existing prerequisite sequences.

Courses that were selected to be a part of the Physics Minor, if taken in proper order, satisfy the existing prerequisite requirements. Further details related to the proposed new program are included in the attached documentation. The APC recommended the Minor in Physics for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Undergraduate Program: Minor in Physics (AS-PHYS-5511), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

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program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

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Department of Physics
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- New Undergraduate Program: Microprogram in Computational Physics
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prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
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Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
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- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

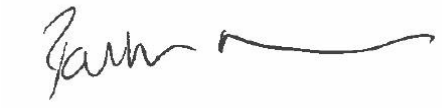
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Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Undergraduate Program (Fast Track) - AS-PHYS-5511 - VERSION : 3

Summary and Rationale for Changes

The Department of Physics is creating a Minor in Physics aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent, namely:

- 3 credits in BIOL 201
- 6 credits in CHEM 205, CHEM 206
- 6 credits in MATH 203, MATH 205
- 12 credits in PHYS 204, PHYS 205, PHYS 206, PHYS 224, PHYS 225, PHYS 226
- 3 credits in MATH 204

*science profile equivalencies are defined under extended credit program definitions found at https://www.concordia.ca/academics/undergraduate/calendar/current/section-31-faculty-of-arts-and-science/section-31-002-programs-and-admission-requirements/alternative-entry-programs/extended-credit-program.html).

As this Minor is built from the existing physics courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses. Diluting these requirements is not feasible from a pedagogical standpoint (students without proper background will be severely disadvantaged) and unfair to Physics Major and Specializations programs students who have to follow the existing prerequisite sequences. Courses that were selected by us to be a part of the Physics Minor, if taken in proper order, satisfy the existing prerequisite requirements.

The overview of many prerequisite requirements will be conducted eventually, as part of our work on overhauling our Biophysics Specialization Program and introducing matching changes to our other programs (work in progress; discussions within the Curriculum Committee).

We remain open to creating programs targeted at more general student population, without any science background, but creating such programs would require major investments / creation of multiple additional courses.

A copy of the LOI proposal appears in the support documents.

Resource Implications

None. The new minor is composed of existing PHYS courses.

New Undergraduate Program (Fast Track) - AS-PHYS-5511 - VERSION : 3

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission AS-PHYS-5511; APC-2026-3-D6. As a result of discussions, APC resolved that the curriculum proposal be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Mar 2026

The Faculty Curriculum Committee (FCC) supports this new program proposal and recommends that it be presented at the next meeting of Arts and Science Faculty Council (ASFC) and Academic Programs Committee (APC).

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 10 Apr 2026

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 20 Feb 2026

The Department of Physics is proposing a Minor in Physics that will allow BSc and Beng students to enroll in physics courses that are not focused on life sciences and that will allow them to apply physical laws and principles to problems to problems touching on astrophysics, biophysics, quantum mechanics, as well as numerical and computational bases, among others.

While aimed at science and engineering students, this program is also open to any student who has a science background or who has taken the appropriate university-level courses to qualify.

Summary of Committee Discussion: Department Approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Commitee, 20 Feb 2026

Approved by:

Valter Zazubovits, Chair, Department of Physics,
Physics Council, 03 Sep 2023

Minor in Physics

Program Requirements

Minor in Physics (24 credits)

9.0 credits:

- MAST 218 Multivariable Calculus I (3.00)
- PHYS 230 Experimental Physics I (3.00)
- PHYS 236 Numerical Methods in Physics with Python (3.00)

3.0 credits chosen from:

- MAST 219 Multivariable Calculus II (3.00)
- PHYS 232 Methods of Theoretical Physics I (3.00)

12.0 credits chosen from:

- PHYS 245 Classical Mechanics (3.00)
- PHYS 252 Optics (3.00)
- PHYS 253 Electricity and Magnetism I (3.00)
- PHYS 260 Introductory Biophysics (3.00)
- PHYS 330 Experimental Physics II (3.00)
- PHYS 334 Thermodynamics (3.00)
- PHYS 335 Methods of Theoretical Physics II (3.00)
- PHYS 355 Electronics (3.00)
- PHYS 367 Modern Physics and Relativity (3.00)
- PHYS 377 Quantum Mechanics I (3.00)
- PHYS 385 Astrophysics (3.00)
- PHYS 440 Computational Methods in Physics with Python (3.00)
- PHYS 459 Condensed Matter Physics I (3.00)

Notes

- Students are responsible for satisfying their particular program requirements.

Summary of Changes (New Undergraduate Program (Fast Track))

Regulation Changes:

- Program Requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2027-28 Minor in Physics

Calendar Section Name: Program Requirements
Calendar Section Type: Regulation
Description of Change: Program Requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Physics

Calendar publication date: 2027/2028/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.230 Department of Physics > Physics Programs > Physics > Minor in Physics

Present Text calendar	Proposed Text
	Program Requirements

Rationale:
Standard field applied for program build.

Resource Implications:
None.

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2027-28 Minor in Physics

Calendar Section Name: Minor in Physics
Calendar Section Type: Program
Description of Change: Minor in Physics New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Physics
Program Name: Minor in Physics
Program Type: Minor
Degree: Minor

Calendar publication date: 2027/2028/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.230 Department of Physics > Physics Programs > Physics > Minor in Physics > Program Requirements

Type of Change: New Program

Present Text calendar	**Proposed Text**
credits	**24 credits** Minor in Physics
0	~~0~~ 9 credits: MAST 218 Multivariable Calculus I (3) PHYS 230 Experimental Physics I (3) PHYS 236 Numerical Methods in Physics with Python (3) 3 credits chosen from: MAST 219 Multivariable Calculus II (3) PHYS 232 Methods of Theoretical Physics I (3) 12 credits chosen from: PHYS 245 Classical Mechanics (3) PHYS 252 Optics (3) PHYS 253 Electricity and Magnetism I (3) PHYS 260 Introductory Biophysics (3) PHYS 330 Experimental Physics II (3) PHYS 334 Thermodynamics (3) PHYS 335 Methods of Theoretical Physics II (3) PHYS 355 Electronics (3) PHYS 367 Modern Physics and Relativity (3) PHYS 377 Quantum Mechanics I (3) PHYS 385 Astrophysics (3) PHYS 440 Computational Methods in Physics with Python (3) PHYS 459 Condensed Matter Physics I (3)

Rationale:

The Minor in Physics will offer BSc and BEng students who are not in a Physics Major or Physics Specialization programs the opportunity to study a coherent set of physics topics that is not as focused on life sciences (the department already has a Minor in Biophysics). It will also provide students more solid training in concepts requiring advanced mathematical treatment in general.

Resource Implications:

None. This program uses existing courses.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: 2027-28 Minor in Physics

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Physics

Calendar publication date: 2027/2028/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 31 Faculty of Arts and Science > Faculty of Arts and Science > Section 31.230 Department of Physics > Physics Programs > Physics > Minor in Physics

Present Text calendar	Proposed Text
	Notes - Students are responsible for satisfying their particular program requirements.

Rationale:
Standard text applied.

Resource Implications:
None.

Impact Report

Other Units

Addition of **MAST 218** to **Minor in Physics** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MAST 219** to **Minor in Physics** requirement
Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Concordia University
Arts and Science
Department of Physics

November 16th, 2023

Department of Physics
Concordia University
7141 Sherbrooke Street West
Montreal, QC H4B 1R6

To: Dr. Richard Courtemanche
Associate Dean, Academic Programs
Faculty of Arts and Science

LOI: Introduction of a Minor in Physics

Dear Dr. Courtemanche, dear Colleagues,

With this letter of intent we are proposing the creation of a *Minor in Physics* program within the Department of Physics.

GENERAL INFORMATION

Name of Proposed Program and Nomenclature:	Minor in Physics
Hosting unit(s):	Department of Physics
Proposed Start Date:	Fall 2024
Prepared by:	Valter Zazubovits with input from Laszlo Kalman, Natalja Zazubovits, Alexandre Champagne and Matthew Storms
Dean Signature(s):	
Date:	

Program Description and Pedagogical Goals
The main goal of introducing *Physics Minor* is to offer B.Sc. science and B.Eng. students who are not in a Physics Major or Physics Specialization programs the opportunity to study a coherent set of physics topics that is not as focused on life sciences (the department already has a Minor in Biophysics). A second goal is to give these students more solid training in concepts requiring

advanced mathematical treatment in general. Unfortunately, some departments at Concordia are under market pressure (from students) to make their programs less quantitative and less mathematical. The problem may be exacerbated by recent CEGEP reforms that have diluted the obligatory part of their Physics and Mathematics curricula. While following these market demands is appropriate for what the outside world expects of many of our graduates, it is not a solution that fits everyone and there is still an important need for some fraction of our science and engineering students to be fully competent in quantitative and mathematically rigorous approaches to science, especially physical/material sciences. On the other hand, not everyone interested in physics and mathematical aspects of science can realistically choose physics as their primary concentration. Introducing a *Minor in Physics*, with a set of courses carefully selected by professional physicists, would offer a very useful training complement to non-physics science and engineering major or specialization programs. The *Minor in Physi*cs is aimed at students whose primary program is in mathematics, engineering, chemistry, biochemistry, biology, and psychology but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of Science DEC or equivalent.

The proposed *Minor in Physics* is composed of courses that are regularly offered (with one exception) and therefore this proposal does not require any additional course allocation. The composition of the minor takes into account existing prerequisite relationships. The minor is based on the CEGEP science profile, i.e. it does not include introductory 200-level courses.

The proposed *Minor in Physics* offers a balanced approach, which ensures that the students both get exposed to the important concepts of physics and are able to choose the topics according to their particular interests or demands of their main programs of concentration. We are also aiming at a balance between lecture courses, and more hands-on experiences / experiential learning, including lab courses and courses involving significant computer programming component. Note that one experimental physics/lab course (PHYS 230) and one course focusing on programming with a popular Python language (PHYS 236) are the obligatory part of the program, while the second half of the program contains one more experimental (PHYS 330) and one more computational (PHYS 440) courses.

In terms of the learning outcomes this *Minor in Physics* will enhance students' abilities to notice, understand and explain how physics applies to phenomena in the world around them. They will become able to recognize how and when physics methods and principles can help address problems in their major or specialization and then apply those methods and principles. Students will acquire skills including but not limited to (i) identifying and applying relevant physical laws and principles to problems; (ii) developing mathematical models and articulating relevant assumptions, approximations, and limitations; (iii) applying mathematical (including calculus, vector and matrix algebra, etc), statistical, and computational skills to develop solutions and (iv) being able to evaluate, assess and interpret their results. They will acquire also hands-on experimental and computational / programming skills.

Proposed Composition of the Minor in Physics (*Prerequisites in parentheses)*:

1) **MAST 218** Multivariable Calculus I (Students who have taken MAST 218 as part of their program can replace it with additional course from the 5-8 list below)

2) **PHYS 230** Experimental Physics I (*PR: PHYS 204/224, PHYS 205/225, PHYS 206/226*)

3) **PHYS 236** Numerical Methods in Physics with Python (*PR: MATH 204, MATH 205*)

4) One of:

MAST 219 Multivariable Calculus II (*PR: MAST 218*)
PHYS 232 Methods of Theoretical Physics I (*CR: MAST 218*)

5-8) Four of (prerequisites will still be enforced):

PHYS 245 Classical Mechanics (*PR: MATH 204, MATH 205*)
PHYS 252 Optics (*PR: PHYS 206*)
PHYS 253 Electricity and Magnetism I (*PR: PHYS 205; co: MAST 218*)
PHYS 260 Introductory Biophysics (*PR: BIOL 201; CHEM 205; MATH 203; PHYS 204, PHYS 205, PHYS 206*)
PHYS 330 Experimental Physics II *(PR: PHYS 230*)
PHYS 334 Thermodynamics (*PR: PHYS 204, CR: MAST 218, MAST 219*)
PHYS 335 Methods of Theoretical Physics II (*PR: PHYS 232, co: MAST 219*)
PHYS 355 Electronics (*PR: PHYS 205*)
PHYS 367 Modern Physics and Relativity (*PR: PHYS 205, PHYS 206*)
PHYS 377 Quantum Mechanics I (*PR: PHYS 367*)
PHYS 385 Astrophysics (*PR: PHYS 204, PHYS205, PHYS206*)
PHYS 440 Computational Methods in Physics with Python (*PR: PHYS 236, PHYS 335, PHYS 377)*
PHYS 459 Condensed Matter I (*PR: PHYS 377*)

While the courses 1-4 provide the background necessary for all subsequent courses (5-8), the latter could be grouped into multiple themes, for instance Optics and Electricity (PHYS 252, PHYS 253, PHYS 330, PHYS 355), Quantum Physics (PHYS 245, PHYS 330, PHYS 367, PHYS 377, PHYS 459), Theoretical Physics (PHYS 245, PHYS 335, PHYS 367, PHYS 377, PHYS 385) or Soft Condensed Matter Physics (PHYS 260, PHYS 334, PHYS 377, PHYS 440). These are just several possible examples. A broad variety of courses in the second half of the Minor would allow students tailoring their experiences in better alignment with their programs of primary concentration or their other interests. Note that this list contains additional courses with strong experiential learning component such as PHYS 330 (experimental / lab) and PHYS 440 (computational / python programming).
Students who have taken MAST 218 as part of their primary program could replace it with an additional course from the 5-8 list.

The combined course load is 24 credits.

1. **Institutional Fit**

This *Minor in Physics* program will serve as physical sciences complement (with strong mathematical background) to various Major and Specialization programs at Concordia.

By introducing this *Minor in Physics* we are addressing several areas outlined in the Concordia Next Generation University document, primarily the directions called "Mix it up" and "Grow smartly", as well as "Teaching for Tomorrow". Offering a minor in Physics will give Science and Engineering students at Concordia the opportunity to customize their BSc. / BEng. into a multidisciplinary training which includes a significant portion of physics (with the appropriate higher-level mathematical background) and quantitative science in general. We feel strongly that given the large number of Science and Engineering students at Concordia, and their wide range of interests, we need to offer a larger variety of physics programs and courses to fulfill the needs for multidisciplinary training as outlined in the "Mix it up" and "Teaching for tomorrow" directions. These multidisciplinary trained students would also constitute top-notch recruits for several of our science graduate programs.
This proposal is also directly in line with the "Grow smartly" direction as it creates a new program for an already existing demand, which is aligned with our research and teaching strengths, and where existing capacity is sufficient to address the program needs (no new sections are needed in Physics).

In terms of the Concordia Strategic Directions document this proposal is aiming to contribute to University's progress in enhancing experiential learning and producing graduates more prepared to work on key areas such as sustainability, renewable energy ("electrifying the society") and to some extent – health.

3. Program Alignment within Unit:

Our department is currently offering a Major in Physics (45/90 credits) as well as Specializations in Physics and Biophysics (66/90 credits) for those who are confident they want to focus on traditional physics or bio/biomedical physics, deepen their knowledge, and possibly continue into graduate programs. These specializations include the courses from the Physics Major program as their common core. There are also two honours programs based on the above two specialization programs. Finally, there is a Minor in Biophysics that is primarily serving the students from life science programs. The only program missing from the perspective of symmetry is the *Minor in Physics* that will likely be taken by students with physical/material science interests. One may note that the majority of our current program students are either majoring in Physics or are in the Physics Specialization or honours programs. Making a reasonable assumption that the demand for Minors will scale the same way as the demand for specializations, we expect more interest in the *Physics Minor* than in Biophysics Minor.

☐ Program Area of Growth (an area of expansion)
☒ Program Area of Strength (capitalizes on existing strengths)

4. Consultation:

This is a Minor program, and therefore students of other programs will take it in addition to their primary Major or Specialization. Thus, it will not undermine any Major or Specialization programs. The only impact we anticipate on other programs would be some increase of demand for MAST 218 and, to a lesser extent, MAST 219 courses. We have contacted Department of Mathematics and Statistics to discuss potential problems. We recognize that there is an increasing demand for the above courses from various programs, not just from Physics ones, and support increasing Math/Stat allocations to offer more sections of MAST 218 and 219 in the future. That said, they will be able to accommodate about 10 additional students with current / already planned resources.

We have also discussed with the Department of Mathematics and Statistics their recent proposal for joint (with ECE) Minor in Data Science. As the title implies, the latter minor focuses strongly on Data Science and Statistics. This is a fairly different focus compared to our Minor in Physics, despite some similarities in the language related to "quantitative science". The two minors will address quite different aspects of this approach, with our "quantitative science" focusing more on the advanced mathematical apparatus necessary for understanding physical science problems and models dealing with them. Although addressing topics such as thermodynamics (PHYS 334) or quantum mechanics (PHYS 377), or analyzing some experimental data (PHYS 230, PHYS 330) does require knowledge of statistics concepts, statistics and data analysis methods *per se* are not the focus of this Minor. Therefore, we do not expect significant competition for students between these two Minors. The Minor in Data Science could be an appealing choice for some Physics students.

Appropriate formal student consultation/surveys will be conducted shortly.

5. Demand and Societal Need:

This proposal addresses existing student demand. Over the last ten years the numbers of students in our programs have grown significantly. These programs have also become more interdisciplinary and gained more exposure to our sister science and engineering departments. This has led to numerous non-physics students, e.g. from engineering, mathematics, chemistry, and other disciplines expressing interest in taking a Minor in Physics. At recent Open Houses and invited lectures in CEGEPS we received multiple inquiries about the availability of a *Minor in Physics* from potential / future Concordia students. Similar requests were often made by Concordia students contacting our Undergraduate Student Adviser / Coordinator. We serve over 2000 science and engineering students per year in 200-level service PHYS courses (PHYS 204, 205, 206 and respective labs) , as well as over 2000 students per year in general elective courses such as PHYS 200, 273 and 284. We will advertise our *Minor in Physics* program to this large student pool every semester. We are confident that introducing this minor will help us to further increase enrollment in existing physics courses and give non-physics students a chance to try physics in a fully coherent but less committal manner than in physics major or specialization programs. We expect the

enrollment of 15 new students per year. This would correspond to an enrollment of 45 students in this program after three years.

The program will also address the broader societal needs, in particular it will help provide non-physics students with greatly improved mathematical/quantitative skills, enhanced exposure to physical sciences and greater understanding of the "why things/phenomena work the way they work", in addition to "how to make something", that is relevant for various science and engineering topics. Thus, those involved with the Minor in Physics will become better professionals in their chosen fields and would be in an advantageous position to contribute to various improvements of the society.

6. Resources and Budget

The proposed *Minor in Physics* is composed of existing regularly offered courses (with the exception of PHYS 385 that is a) part of an extensive list to choose from and b) that we want to reintroduce eventually in the near future) and therefore this proposal does not require additional course allocations. Furthermore, the department is already offering TA support in its existing 200- and 300-level program courses (this support focuses on tutorials but also has grading component). Given the current size of these courses, additional 15 students could be accommodated reasonably easily. See section 4 for MAST component of the proposed program. Thus, for the first several years of the program we are only requesting additional TA support of one regular (130 hours) TA position per year, for PHYS 385.

Should the Minor in Physics, along with our other programs, eventually grow beyond its anticipated size, the Department would be interested in additional course allocations and TA support allowing us to offer some 200-level program courses twice a year instead of current once a year.

This proposal was approved in principle by the Departmental Curriculum Committee on August 30, 2023 and by the Department Council on September 1, 2023. This version has been updated based on the feedback provided by Dr. Courtemanche on the earlier version submitted on October 24, 2023. Thank you for your consideration, and please do not hesitate to contact us if additional information is required.

With best regards,
Valter Zazubovits



Chair

DATE: November 28, 2025

TO: Richard Courtemanche, Associate Dean, Academic Programs and Development, FAS

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Proposed Minor in Physics

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the proposed minor in Physics. I apologize for the delay in responding to this LOI and can assure you that every effort will be made to shepherd quickly through governance.

We are very pleased to see a minor emerge that makes use of already-scheduled courses and poses very few additional resources for the department, and we appreciate attempts to create the curriculum in an accessible way for students in other departments.

Our only concern is that if a student wishes to pursue this program and does not have a conventional science background, then the pre-requisites they are asked to take in preparation are quite extensive and well-exceed the courses expected for a minor. We wonder if this will act as a deterrent for students who have some relevant background – for instance, students in Engineering who have been trained in STEM, and who might come to Physics with an interest in nanoscience, or with a mind to another convergence of scientific pursuit. While we understand the necessity of prior knowledge, we wonder if you might consider lightening the pre-requisite load for students outside of the sciences. I am very happy to discuss this further – and, ultimately, defer to you as experts.

Yours Sincerely,

RACHEL BERGER

Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Pascale Sicotte, Dean, Faculty of Arts and Sciences
Dr. Valter Zazubovits, Chair, HKAP
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

From: Valter Zazubovits
To: Nicole Freeman
Subject: Fw: VPITL memo in response to the LOI for the minor in Physics
Date: Wednesday, January 28, 2026 3:33:19 PM

Dear Nicole,

As requested, Rachel's response to my response.

Regards,

Valter Zazubovits, Professor and Chair

Department of Physics, Concordia University, Montreal

From: Rachel Berger <rachel.berger@concordia.ca>
Sent: Tuesday, December 9, 2025 6:15 PM
To: Valter Zazubovits <valter.zazubovits@concordia.ca>; Richard Courtemanche <richard.courtemanche@concordia.ca>; Julie Johnston <julie.johnston@concordia.ca>
Cc: Laszlo Kalman <Laszlo.Kalman@concordia.ca>
Subject: Re: VPITL memo in response to the LOI for the minor in Physics

Hi Valter,

Sorry for the delay in getting back to you. As I said in the memo, you're the experts. If the pre-reqs are necessary to ensure the quality of the program, and you have a good sense of your audience for this program, I'm happy to keep things as is.

RB

Dr. Rachel Berger
Vice-Provost, Innovation in Teaching and Learning
Associate Professor of History
Concordia University

Concordia University is located on unceded Indigenous lands. The Kanien'kehá:ka Nation is recognized as the custodians of the lands and waters on which we gather today.

From: Valter Zazubovits <valter.zazubovits@concordia.ca>
Date: Thursday, December 4, 2025 at 10:58 AM
To: Rachel Berger <rachel.berger@concordia.ca>, Richard Courtemanche <richard.courtemanche@concordia.ca>, Pascale Sicotte <pascale.sicotte@concordia.ca>, Julie Johnston <julie.johnston@concordia.ca>, Daniel Therrien <daniel.therrien@concordia.ca>

Cc: Laszlo Kalman <Laszlo.Kalman@concordia.ca>
Subject: Re: VPITL memo in response to the LOI for the minor in Physics

Dear Rachel, dear All,
Thank you very much for your response. We appreciate your support.

Indeed, this Physics Minor is designed in such way that it is based on CEGEP science profile and the intended audience is students majoring in other sciences and engineering (who take most if not all of the courses of the CEGEP profile). It was never intended as something aimed at students with no background whatosoever.

It would be impossible to make a Minor consisting of existing Major and Specialization courses and not inheriting the relevant prerequisite relationships. Lightening any of them will affect not only the Minor, but the rest of our programs as well.

That said, we are open to discussing these topics further. For instance, do you have specific concerns with some particular scenario? Some particular prerequisites you are concerned about?

With best regards,
Valter Zazubovits, Professor and Chair
Department of Physics, Concordia University, Montreal

From: Rachel Berger <rachel.berger@concordia.ca>
Sent: Sunday, November 30, 2025 3:34 PM
To: Richard Courtemanche <richard.courtemanche@concordia.ca>; Pascale Sicotte <pascale.sicotte@concordia.ca>; Julie Johnston <julie.johnston@concordia.ca>; Daniel Therrien <daniel.therrien@concordia.ca>; Valter Zazubovits <valter.zazubovits@concordia.ca>
Subject: VPITL memo in response to the LOI for the minor in Physics

Hello,

Please find attached a memo regarding the Provost's support for the department to pursue it's proposed minor.

Many thanks,

Dr. Rachel Berger
Vice-Provost, Innovation in Teaching and Learning
Associate Professor of History
Concordia University

Concordia University is located on unceded Indigenous lands. The Kanien’kehá:ka Nation is recognized as the custodians of the lands and waters on which we gather today.

From: Valter Zazubovits
To: Nicole Freeman
Subject: Fw: physics minor
Date: Monday, March 23, 2026 11:13:38 AM

Here it is…

Valter Zazubovits, Professor and Chair
Department of Physics, Concordia University, Montreal

From: Valter Zazubovits <valter.zazubovits@concordia.ca>
Sent: Tuesday, February 10, 2026 1:46 PM
To: Nicole Freeman <nicole.freeman@concordia.ca>
Subject: Fw: physics minor

Dear Nicole,
Below please find the e-mail trail with the Math department.

The following statement was there in the original LOI:

Dear Nicole,
This is what we have in the LOI:

This is a Minor program, and therefore students of other programs will take it in addition to their primary Major or Specialization. Thus, it will not undermine any Major or Specialization programs. The only impact we anticipate on other programs would be some increase of demand for MAST 218 and, to a lesser extent, MAST 219 courses. We have contacted Department of Mathematics and Statistics to discuss potential problems. We recognize that there is an increasing demand for the above courses from various programs, not just from Physics ones, and support increasing Math/Stat allocations to offer more sections of MAST 218 and 219 in the future. That said, they will be able to accommodate about 10 additional students with current / already planned resources.

Valter Zazubovits, Professor and Chair
Department of Physics, Concordia University, Montreal

From: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>

Sent: Thursday, October 12, 2023 1:15 PM
To: Valter Zazubovits <valter.zazubovits@concordia.ca>
Cc: Marco Bertola <marco.bertola@concordia.ca>
Subject: RE: physics minor

Dear Valter,

Thank you for the clarification! I checked with Sandra, and there are currently ~20 seats reserved for physics students each term for MAST 218. Many end up not getting used for physics (averages ~30 students in MAST 218 from physics every year) so accommodating 5-10 more physics students in those sections should be possible. However, these courses are jam-packed (with our program students and computer science students) and this information is useful to help us with planning, and possibly looking into adding a section.

I believe a Minor still has to go through the FCC/ASFC/APC/Senate route so I think this would be slated for 2025-26? We are also working on a Minor LOI so if you find a faster process, please let us know!

Lisa

From: Valter Zazubovits <valter.zazubovits@concordia.ca>
Sent: Thursday, October 12, 2023 11:11 AM
To: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>
Cc: Marco Bertola <marco.bertola@concordia.ca>
Subject: Re: physics minor

Dear Lisa, dear Marco,
the proposal is prepared but not submitted. We are submitting LOI very soon, once I figure out how to write the budget document.
Since it is a Minor, we may try the accelerated procedure.
With best regards,
Valter

From: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>
Sent: Thursday, October 5, 2023 11:38 AM
To: Valter Zazubovits <valter.zazubovits@concordia.ca>
Cc: Marco Bertola <marco.bertola@concordia.ca>
Subject: RE: physics minor

Dear Valter,

Thank you for the clarification! We are likely going to cross-list our MAST 218/MATH 264 next year; that should give us "back" some more seats so hopefully this will be manageable. I will check with Sandra on the reserve caps (I assume there's one for physics on there) and will see if we can increase

it by ~10 for when the Minor is slated to start. Where is the proposal in the curriculum pipeline? (If it is going to be submitted to FCC this academic year, I think that means it will be on the calendar in 2025-26 at the earliest?) Sorry for the nitty-gritty detail questions – but this will help us plan our course offerings and reserve caps next year/the following year.

Lisa

From: Valter Zazubovits <valter.zazubovits@concordia.ca>
Sent: Thursday, October 5, 2023 8:45 AM
To: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>
Cc: Marco Bertola <marco.bertola@concordia.ca>
Subject: Re: physics minor

Dear Lisa, dear Marco,
The minor proposal includes MAST 218 as obligatory (it is directly or indirectly a prerequisite for too many PHYS courses, it does not make sense without it) and MAST 219 is part of a "choose from 2" list, the other course on that list being a PHYS course.
With best regards,
Valter

From: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>
Sent: Wednesday, October 4, 2023 4:55 PM
To: Valter Zazubovits <valter.zazubovits@concordia.ca>
Cc: Marco Bertola <marco.bertola@concordia.ca>
Subject: RE: physics minor

Dear Valter,

Thank you for this information! Will MAST 218 (and possibly MAST 219) be a requirement of the Minor, or an elective from a list the student can choose from? MAST 218 and MAST 219 also fulfill the 'mathematics electives' for Computer Science students (they're required to take six credits of math electives: https://www.concordia.ca/academics/undergraduate/calendar/current/section-71-gina-cody-school-of-engineering-and-computer-science/section-71-70-department-of-computer-science-and-software-engineering/section-71-70-2-degree-requirements-bcompsc-.html#20664) so MAST 218 in particular gets full, very fast. When you have the details of the Minor ready, please do share that with us. If MAST 218 is slated to become required (or is a necessary pre-requisite for required courses in the Minor), that will be good for us to know.

Lisa

From: Valter Zazubovits <valter.zazubovits@concordia.ca>
Sent: Tuesday, October 3, 2023 9:38 PM
To: Marco Bertola <marco.bertola@concordia.ca>
Cc: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>

Subject: Re: physics minor

Dear Marco, dear Lisa,
thank you very much!
We are planning on officially declaring it at 15 per year, but we do not really know.
And yes, at best it will start from next year.
With best regards,
Valter

From: Marco Bertola <marco.bertola@concordia.ca>
Sent: Tuesday, October 3, 2023 6:00 PM
To: Valter Zazubovits <valter.zazubovits@concordia.ca>
Cc: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>
Subject: Re: physics minor

Hi Valter,

great!

Would you be able to estimate the demand?
We already received the budget for this year from the Dean's office (which I assume you have too) so we have to move under constraints but probably your proposal will become effective next fall and thus there is time.

Let us know (in cc is Dr. Lisa Kakinami, our associate chair)
Best
M

Dr. Marco Bertola,

Concordia University,
Dept. of Math. & Stat.
SGW Campus, LB-901-23,
1455 de Maisonneuve W.,
H3G 1M8, Montreal (QC).
tel. +1-(514)-848--2424 ext. 3228
fax. +1-(514)-848-2831

On Oct 3, 2023, at 2:47 PM, Valter Zazubovits <valter.zazubovits@concordia.ca> wrote:

Dear Marco,
Our department is planning to propose a Physics Minor...
This may increase the numbers of students willing to take MAST 218 and 219...
Please let me know what you think.
I will be hapopy to provide any additional information.
With bestr regards,
Valter Zazubovits, Professor and Chair
Department of Physics, Concordia University, Montreal

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Undergraduate Microprogram in Songwriting and Music Production (FA-MUSI-6036)(the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The Department of Music and the Faculty of Fine Arts expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills.

The Microprogram is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

In contrast to CEGEP-level programs that focus primarily on recording and audio engineering, this Microprogram emphasizes creativity and artistic development, building on the expertise of the Department of Music and the Faculty of Fine Arts.

The Microprogram develops competencies in songwriting, beat-making, arrangement, recording, editing, mixing, and digital distribution through a strongly practice-based approach, culminating in a portfolio of original works suitable for professional release. It responds to growing demand driven by the accessibility of home studio technologies, streaming platforms, and self-production practices. Recent enrolment trends—including strong demand for new production courses and increased admissions through portfolio pathways—demonstrate clear student interest. Designed for flexibility, the Microprogram is offered in the evening with part-time options. Credits can be transferred to an existing BFA and the program aligns with the School of Performance's interdisciplinary mandate. Recruitment consultations confirm strong support, with an expected intake of approximately 25 students annually (minimum 15 in year one).

Further details are included in the attached documentation. The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Undergraduate Microprogram in Songwriting and Music Production (FA-MUSI-6036), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

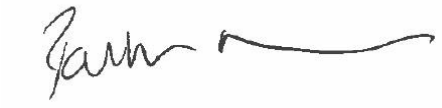
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

Summary and Rationale for Changes

This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

In contrast to CEGEP-level programs that focus primarily on recording and audio engineering, this microprogram emphasizes creativity and artistic development, building on the expertise of the Department of Music and the Faculty of Fine Arts. It develops competencies in songwriting, beat-making, arrangement, recording, editing, mixing, and digital distribution through a strongly practice-based approach, culminating in a portfolio of original works suitable for professional release.

The program responds to growing demand driven by the accessibility of home studio technologies, streaming platforms, and self-production practices. Recent enrolment trends—including strong demand for new production courses and increased admissions through portfolio pathways—demonstrate clear student interest.

Designed for flexibility, the program is offered in the evening with part-time options. Credits can be transferred to an existing BFA and the program aligns with the School of Performance’s interdisciplinary mandate. Recruitment consultations confirm strong support, with an expected intake of approximately 25 students annually (minimum 15 in year one).

For further information, please refer to the full program proposal attached in the dossier.

Resource Implications

The microprogram leverages existing courses, faculty expertise, and facilities, ensuring efficient implementation with limited new resource requirements. Additional teaching resources equivalent to 9 credits will be required to support new sections of MPRD 201 and MPRD 202 and to offer MUSI 263 and MUSI 363 annually. Increased enrollment in MUSI 263 will require approximately 40 TA hours, while extended evening delivery will necessitate additional technician support for the CDA Music Depot. Modest communication and recruitment funds are also anticipated. No new facilities or major equipment investments are required; however, increased use of studios and equipment will have longer-term implications for maintenance and renewal.

The resource implications have been discussed with and approved by the Director, Office of the Dean and Faculty Operations, Tristan Khaner, and the Dean of the Faculty of Fine Arts, Annie Gerin.

For more details, please refer to the 'resource needs' section of the full program proposal attached in the dossier.

New Undergraduate Program (Fast Track) - FA-MUSI-6036 - VERSION : 2

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 15 May 2026

Approved by:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Following approval of the Faculty Councils, APC members reviewed the curriculum submission FA-MUSI-6036; APC-2026-3-D5. As a result of discussions, APC resolved that the curriculum proposal be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Dr. Rachel Berger, Vice-Provost, Teaching and Learning,
Academic Programs Committee, 14 Apr 2026

Approved by:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Curriculum Committee, 17 Apr 2026

Please find attached the proposal for the Microprogram in Songwriting and Music Production. The Faculty of Fine Arts Curriculum Committee (FCC) approved these changes on April 8, 2026. Since Faculty Council has delegated approval privileges to FCC (with the exception of major changes) this dossier will only be shared to Faculty Council but not submitted for approval at their meeting scheduled on April 17, 2026. I kindly request that the proposed changes be presented for consideration at the Academic Programs Committee meeting on April 14, 2026.

Summary of Committee Discussion: Faculty Curriculum Committee Approval (FCC/FAPC)

For Submission to:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 17 Apr 2026

Approved by:

Dr. Shauna Janssen, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 08 Apr 2026

This dossier was reviewed and approved by the Faculty of Fine Arts Curriculum Committee at their meeting on April 8, 2026.

The dossier will be forwarded to Faculty Council for informational purposes at their next meeting.

We hereby submit the dossier for the consideration of APC at their meeting on April 14, 2026.

Summary of Committee Discussion: Department Approval

For Submission to:

Dr. Shauna Janssen, Associate Dean,
Academic Programs and Pedagogy, 08 Apr 2026

Approved by:

Joshua Rager, Chair, Department of Music,
Departmental Curriculum Committee, 23 Feb 2026

The dossier was reviewed and approved by the Department of Music curriculum committee on Monday, February 23rd at 11:00 AM.

Summary of Changes (New Undergraduate Program (Fast Track))

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
MUSI 263 Songwriting I Change										

Regulation Changes:

- Programs offered Change
- Program requirements New
- Notes New

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Songwriting and Music Production

Calendar Section Name: Programs offered
Calendar Section Type: Regulation
Description of Change: Programs offered Change

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Music

Calendar publication date: 2026/2027/Summer
Type of change: Regulation Change

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 81 Faculty of Fine Arts > Faculty of Fine Arts > Section 81.10 Programs and Admission Requirements

Present Text calendar	Proposed Text
Programs offered	Programs offered
For information concerning any of the following programs, please consult the calendar section listed opposite each program.	For information concerning any of the following programs, please consult the calendar section listed opposite each program.
Recommended Profile and ~~Specific Requirements~~ Program Calendar Section	**Recommended Profile and Specific Requirements Program Calendar Section**
Specializations:	**Specializations**:
0.00, A,G Acting for the Theatre Section 81.130 School of Performance	0.00, A,G Acting for the Theatre Section 81.130 School of Performance
0.00, G,K Art Education – Visual Arts Section 81.40 Department of Art Education	0.00, G,K Art Education – Visual Arts Section 81.40 Department of Art Education
0.00, 10.12, G,K Computation Arts Section 81.90 Department of Design and Computation Arts	0.00, 10.12, G,K Computation Arts Section 81.90 Department of Design and Computation Arts
0.00 Film and Moving Image Studies Section 81.60 Mel Hoppenheim School of Cinema	0.00 Film and Moving Image Studies Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K Film Production Section 81.60 Mel Hoppenheim School of Cinema	0.00, G,K Film Production Section 81.60 Mel Hoppenheim School of Cinema
0.00, A Jazz Studies Section 81.130 School of Performance	0.00, A Jazz Studies Section 81.130 School of Performance
0.00, A Music Performance Section 81.130 School of Performance	0.00, A Music Performance Section 81.130 School of Performance
0.00, A Music Composition and Production Section 81.130 School of Performance	0.00, A Music Composition and Production Section 81.130 School of Performance
0.00, A,G Performance Creation Section 81.130 School of Performance	0.00, A,G Performance Creation Section 81.130 School of Performance
0.00, A,G,K Scenography Section 81.130 School of Performance	0.00, A,G,K Scenography Section 81.130 School of Performance
Majors:	**Majors**:
0.00, G,K Art Education – Visual Arts Section 81.40 Department of Art Education	0.00, G,K Art Education – Visual Arts Section 81.40 Department of Art Education
0.00 Art History Section 81.50 Department of Art History	0.00 Art History Section 81.50 Department of
0.00 Art History and Film Studies Section 81.50 Department of Art History , Section 81.60 Mel Hoppenheim School of Cinema	

D1

Present Text calendar	Proposed Text
0.00, G,K Art History and Studio Art Section 81.50 Department of Art History 0.00, G,K Ceramics Section 81.110 Department of Studio Arts 0.00, 10.12, G,K Computation Arts and Computer Science Section 81.90 Department of Design and Computation Arts 0.00, A Contemporary Dance Section 81.130 School of Performance 0.00, G,K Design Section 81.90 Department of Design and Computation Arts 0.00, G,K Electroacoustic Studies Section 81.130 School of Performance 0.00, G,K Fibres and Material Practices Section 81.110 Department of Studio Arts 0.00 Film and Moving Image Studies Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Film Animation Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Film Production Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Intermedia (Video, Performance and Electronic Arts) Section 81.110 Department of Studio Arts 0.00, A Music Section 81.130 School of Performance 0.00, G,K Painting and Drawing Section 81.110 Department of Studio Arts 0.00, G,K Photography Section 81.110 Department of Studio Arts 0.00, G,K Print Media Section 81.110 Department of Studio Arts 0.00, G,K Sculpture Section 81.110 Department of Studio Arts 0.00, G,K Studio Art Section 81.110 Department of Studio Arts **Minors:** 0.00, G,K Art Education – Visual Arts Section 81.40 Department of Art Education 0.00 Art History Section 81.50 Department of Art History 0.00, G Cinema Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Computation Arts Section 81.90 Department of Design and Computation Arts 0.00, G,K Electroacoustic Studies Section 81.130 School of Performance 0.00 Film and Moving Image Studies Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Film Animation Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Game Design Section 81.90 Department of Design and Computation Arts 0.00, Theory Test Music Section 81.130 School of Performance 0.00, G,K Print Media Section 81.110 Department of Studio Arts	Art History 0.00 Art History and Film Studies Section 81.50 Department of Art History , Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Art History and Studio Art Section 81.50 Department of Art History 0.00, G,K Ceramics Section 81.110 Department of Studio Arts 0.00, 10.12, G,K Computation Arts and Computer Science Section 81.90 Department of Design and Computation Arts 0.00, A Contemporary Dance Section 81.130 School of Performance 0.00, G,K Design Section 81.90 Department of Design and Computation Arts 0.00, G,K Electroacoustic Studies Section 81.130 School of Performance 0.00, G,K Fibres and Material Practices Section 81.110 Department of Studio Arts 0.00 Film and Moving Image Studies Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Film Animation Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Film Production Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Intermedia (Video, Performance and Electronic Arts) Section 81.110 Department of Studio Arts 0.00, A Music Section 81.130 School of Performance 0.00, G,K Painting and Drawing Section 81.110 Department of Studio Arts 0.00, G,K Photography Section 81.110 Department of Studio Arts 0.00, G,K Print Media Section 81.110 Department of Studio Arts 0.00, G,K Sculpture Section 81.110 Department of Studio Arts 0.00, G,K Studio Art Section 81.110 Department of Studio Arts **Minors:** 0.00, G,K Art Education – Visual Arts Section 81.40 Department of Art Education 0.00 Art History Section 81.50 Department of Art History 0.00, G Cinema Section 81.60 Mel Hoppenheim School of Cinema

D2

Present Text calendar	Proposed Text
0.00 Theatre Section 81.130 School of Performance **Microprograms:** 0.00, G Fundamentals of Digital Filmmaking Section 81.60 Mel Hoppenheim School of Cinema 0.00, G Screenwriting and Film Producing Section 81.60 Mel Hoppenheim School of Cinema 0.00, G Web Design and User Interface Section 81.90 Department of Design and Computation Arts	0.00, G,K Computation Arts Section 81.90 Department of Design and Computation Arts 0.00, G,K Electroacoustic Studies Section 81.130 School of Performance 0.00 Film and Moving Image Studies Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Film Animation Section 81.60 Mel Hoppenheim School of Cinema 0.00, G,K Game Design Section 81.90 Department of Design and Computation Arts 0.00, Theory Test Music Section 81.130 School of Performance 0.00, G,K Print Media Section 81.110 Department of Studio Arts 0.00 Theatre Section 81.130 School of Performance **Microprograms:** 0.00, G Fundamentals of Digital Filmmaking Section 81.60 Mel Hoppenheim School of Cinema 0.00, G Screenwriting and Film Producing Section 81.60 Mel Hoppenheim School of Cinema K Songwriting and Music Production Section 81.130 School of Performance 0.00, G Web Design and User Interface Section 81.90 Department of Design and Computation Arts

Rationale:

Addition of the new microprogram which has requires a portfolio submission.

Resource Implications:

None.

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Songwriting and Music Production

Calendar Section Name: Program requirements
Calendar Section Type: Regulation
Description of Change: Program requirements New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Music

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 81 Faculty of Fine Arts > Faculty of Fine Arts > Section 81.130 School of Performance > School of Performance Programs > Music Programs > Microprograms > Microprogram in Songwriting and Music Production

Present Text calendar	Proposed Text
	Program requirements

Rationale:

Resource Implications:

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Songwriting and Music Production

Calendar Section Name: Microprogram in Songwriting and Music Production
Calendar Section Type: Program
Description of Change: Microprogram in Songwriting and Music Production New
Proposed: Undergraduate Curriculum Changes
Faculty/School: Faculty of Fine Arts
Department: Music
Program Name: Microprogram in Songwriting and Music Production
Program Type: Micro Program
Degree: Micro Program
Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 81 Faculty of Fine Arts > Faculty of Fine Arts > Section 81.130 School of Performance > School of Performance Programs > Music Programs > Microprograms > Microprogram in Songwriting and Music Production > Program requirements

Type of Change: New Program

Present Text calendar	Proposed Text
credits	**12 credits** Microprogram in Songwriting and Music Production
0	~~0~~ 12 credits: MUSI 263 Songwriting I (3) MUSI 363 Songwriting II (3) MPRD 201 Music Production Fundamentals I (3) MPRD 202 Music Production Fundamentals II (3)

Rationale:

This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Resource Implications:

The microprogram leverages existing courses, faculty expertise, and facilities, ensuring efficient implementation with limited new resource requirements. Additional teaching resources equivalent to 9 credits will be required to support new sections of MPRD 201 and MPRD 202 and to offer MUSI 263 and MUSI 363 annually.

See the 'resource needs' section for more details.

D6

REGULATIONS CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Songwriting and Music Production

Calendar Section Name: Notes
Calendar Section Type: Regulation
Description of Change: Notes New

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Music

Calendar publication date: 2026/2027/Summer
Type of change: New Regulation

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 81 Faculty of Fine Arts > Faculty of Fine Arts > Section 81.130 School of Performance > School of Performance Programs > Music Programs > Microprograms > Microprogram in Songwriting and Music Production

Present Text calendar	Proposed Text
	Notes Students are responsible for fulfilling their particular program requirements.

Rationale:
This standard note is being added as for all undergraduate microprograms in the Faculty of Fine Arts.

Resource Implications:
NA.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Fast Track)
Dossier Title: Microprogram in Songwriting and Music Production

Calendar Section Name: MUSI 263
Calendar Section Type: Course
Description of Change: MUSI 263 Songwriting I Change

Proposed: Undergraduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Music

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Undergraduate > 2026-2027 Undergraduate Calendar > Faculties > Section 81 Faculty of Fine Arts > Faculty of Fine Arts > Section 81.130 School of Performance > School of Performance Courses > Music Courses > Music Courses

Type of Change: Course Change

Present Text calendar	Proposed Text
MUSI 263 Songwriting I (3 credits)	MUSI 263 Songwriting I (3 credits)
Prerequisites:	*Prerequisites:*
~~The following courses must be completed previously: MUSI 202 , MUSI 204 .~~	Enrolment in a Music program offered by the School of Performance is required.
Description :	*Description :*
This course allows students to explore and develop their skills through regular songwriting as well as critical analysis of existing songs.	This course allows students to explore and develop their skills through regular songwriting as well as critical analysis of existing songs.
Component(s):	*Component(s):*
Lecture ; Studio	Lecture ; Studio
Notes :	*Notes :*

Rationale:
MUSI 263 previously required MUSI 202 (Aural Perception Fundamentals I) and MUSI 204 (Harmony Fundamentals I) as prerequisites. In line with the department's efforts to broaden access to its programs, we recognize that songwriting is not exclusively grounded in traditional Western music theory.

Students admitted to the Major in Music, the Specialization in Music Composition and Production, and the proposed Microprogram in Songwriting and Music Production come from diverse musical backgrounds. However, their admission portfolios ensure that they possess the necessary musical skills to succeed in MUSI 263. As such, enrolment in a Music program offered by the School of Performance is a more appropriate prerequisite than specific theory courses.

Resource Implications:
None.

Impact Report

Programs

Specialization in Music Composition and Production

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 81 Faculty of Fine Arts -> Faculty of Fine Arts -> Section 81.130 School of Performance -> School of Performance Programs -> Music Programs -> Music Composition and Production Programs -> BFA Specialization in Music Composition and Production -> Program Requirements

Source of Impact

- MUSI 263

Courses

MUSI 363

Undergraduate -> 2026-2027 Undergraduate Calendar -> Faculties -> Section 81 Faculty of Fine Arts -> Faculty of Fine Arts -> Section 81.130 School of Performance -> School of Performance Courses -> Music Courses -> Music Courses

Source of Impact

- MUSI 263

Other Units

Addition of **Section 81.20 Degree Requirements** to **Notes** requirement

Source of other unit Impact

- Sub Section is housed in Section 81.20 Degree Requirements

DATE: March 6, 2025

TO: Dr. Shauna Janssen, Associate Dean, Academic Programs and Pedagogy, FOFA

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Songwriting and Music Production

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the proposed Microprogram in Songwriting and Music Production . We are very pleased to see a microprogram emerge that makes use of already-scheduled courses and poses no resources for the department, and we appreciate attempts to create curriculum accessible to the community.

Our recommendation moving forward is to build a strong plan for recruitment; we are very interested to see the sorts of new learners this program might bring to the University and would love to support you in making plans for outreach.

Yours Sincerely,

RACHEL BERGER

Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Annie Gérin, Dean, Faculty of Fine Arts
Dr. George Dimitrov, Chair, Music
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

Proposal for Microprograms

MICROPROGRAM GENERAL INFORMATION

New microprograms are developed collaboratively between the hosting unit(s), the Departments, the Faculties, the School of Graduate Studies and the Office of the Provost.

Microprogram Level of study	Undergraduate
Program name	Microprogram in Songwriting and Music Production
Hosting unit(s)	School of Performance (Previously Department of Music)
Stackability	• Towards the Minor in Music, Major in Music, Specialization in Music Composition and Production • With other microprograms in Fine Arts or across the University leading towards an Undergraduate Certificate or BFA/BA
Total credit value	12 credits
Leads	Dr. Georges Dimitrov, Department of Music
Proposed start date	September 2026
Dean signature	

PROGRAM DESCRIPTION (250 words)

This microprogram aims to expand our offerings in songwriting and music production and attract potential students who are not yet ready to commit to a full BFA, or professionals from the field wishing to develop their skills. The program would be composed of 4 courses that the department already offers:

- MUSI 263 Songwriting I (fall)
- MUSI 363 Songwriting II (winter)
- MPRD 201 Music Production Fundamentals I (fall)
- MPRD 202 Music Production Fundamentals II (winter)

In contrast to existing CEGEP-level offerings in the city that focus primarily on recording and audio engineering, this program builds on the expertise of the Department of Music and the Faculty of Fine Arts by emphasizing creativity and artistic development.

Courses would be offered in the evening, over the course of one September to April academic year. Students would also be able to complete the microprogram part-time over two years, for example by

taking MPRD 201/202 in the first year, and MUSI 263/363 in the second year. Offering the program during the academic year allows for efficient integration with some existing BFA courses, combining participants in the microprogram with students registered in our regular BFA programs for a single teaching contract, for increased cost efficiency. Other courses require adding additional sections, but allow flexibility, as both day and evening courses would be available to all, allowing BFA students to have new evening options.

TARGET AUDIENCE, ADMISSION REQUIREMENTS, COMPETENCIES IN DEMAND, MARKET RESEARCH AND RECRUITMENT STRATEGY (250 words)

The program addresses professional competencies in songwriting, beat-making, arrangement, recording, editing, mixing, and digital distribution. It is strongly practice-oriented: students develop original works throughout the program and graduate with a portfolio of finished tracks suitable for professional release, integrating experiential learning directly into coursework.

The target audience is creators interested in learning songwriting and music production who are not yet ready to commit to a full bachelor's degree, as well as artists with some prior experience who seek a compact and targeted educational framework to solidify core skills often learned independently without formal guidance.

The microprogram is offered at the undergraduate level because it focuses on foundational artistic and technical skills and is constituted of existing undergraduate courses. Applicants will be admitted on a portfolio basis using the structure already in place for the *Specialization in Music Composition and Production*. Applicants should demonstrate creative potential through submission of recorded songs or tracks, basic musical literacy, and familiarity with digital audio tools. Advanced technical training is not required.

Social media, streaming platforms, and the affordability of home studio equipment have made self-production and distribution accessible to all, generating enormous interest among prospective artists. The Department of Music is already responding to these practices, having transformed our *Specialization in Music Composition* into a *Specialization in Music Composition and Production*, with new admission pathways that make the program more accessible and new courses in Music Production. When first offered in the 2025‑26 academic year, those courses (MPRD 201/202) far exceeded projected demand, leading us to open second sections. Two-thirds of students admitted in the most recent cycle to our BFA programs in Music entered through the new portfolio options oriented toward songwriting and production, and enrollment in our Songwriting course doubled this year.

As such, this demonstrates strong demand for the artistic and professional competencies involved. While there are multiple professional recording schools in Quebec and Canada, they are primarily AEC-level or independent professional trainings without a formal university credential. They also tend to be longer programs with a stronger emphasis on recording and engineering, rather than on creative songwriting and artistic development. An environmental scan indicates that there is currently no equivalent university-level microprogram in Quebec, and only one comparable offering elsewhere in Canada (in Manitoba).

The program is designed for flexibility, with evening delivery to accommodate working professionals and other students with daytime commitments, and the possibility of part-time

completion. Discussions with recruitment and communications confirm support for the program. The expected intake is approximately 25 students per year, with a minimum of 15 in the first year.

EXPERTISE and CAPACITY OF THE UNIT (150 words)

Over the last decade, the Department of Music has successfully transformed its pedagogical approach to include contemporary Songwriting and Music Production practices. The expertise is firmly established, supported by experienced faculty, dedicated production courses, and appropriate studio and classroom facilities. The Faculty of Fine Arts provides a vibrant and interdisciplinary creative environment, with a strong commitment to inclusivity and diversity - essential conditions for supporting emerging artists and producers.

The proposed microprogram aligns directly with existing curricular strengths and complements our Major in Music and Specialization in Music Composition and Production. The 12 credits are fully stackable within these programs, counting toward required courses or electives. This allows graduates of the microprogram to transition seamlessly into a BFA should they wish to continue their studies. If successful, the microprogram could be stacked with other short programs within Fine Arts and across the university to form a 30-credit Undergraduate Certificate and eventually a BFA/BA. The microprogram could be stacked with existing short programs offered at Concordia, or with other microprograms and certificates that will be developed in the future.

RESOURCE NEEDS (100 words)

The microprogram will require 9 additional teaching credits to support new sections of MPRD 201 and MPRD 202, and to offer both MUSI 263 and MUSI 363 annually rather than in alternating years. MUSI 263 and MUSI 363 will enroll students from both the BFA programs and the microprogram, with a cap of 60 students for Songwriting I and 40 students for Songwriting II. These caps reflect historical enrollment patterns, where a larger number of students take the introductory course as an elective, and also align pedagogically: Songwriting I is well suited to a larger, lecture-based format, while Songwriting II emphasizes more individualized development in a smaller class setting. Expanding MUSI 263 to a cap of 60 students will require approximately 40 TA hours. Additional technician hours will be needed to keep the CDA (Centre for Digital Arts) Music Depot open later in the evening when MPRD 201/202 are offered. Modest communications and advertising funds should also be allocated to promote the launch of the program. No new facilities or major equipment investments are anticipated at this time, however, increased usage of studio equipment and production facilities will have long-term implications for maintenance, repair, and future capital renewal.

The resource implications have been discussed with and approved by the Director, Office of the Dean and Faculty Operations, Tristan Khaner.

CONSULTATION (100 words)

Preliminary consultations have taken place with the Centre for Digital Arts (CDA) regarding the impact of the program on studio facilities and technical support capacity. CDA is enthusiastic about the initiative and confident in its ability to support the program with the additional resources outlined above. Costing simulations and discussions with the Dean’s Office have confirmed the program’s financial viability. Internal discussions have also addressed potential impacts on administrative staff and scheduling.

While no formal external partnerships are required at this stage, the Department maintains active connections with the local music community, independent artists, and industry professionals, which provide a supportive ecosystem for experiential learning and potential collaborations.

ENVIRONMENTAL SCAN – MICROPROGRAM IN SONGWRITING AND MUSIC PRODUCTION

University offerings (Québec and Canada)

Institution	**University of Manitoba**	**Program title**	**Micro-certificate in Songwriting (Undergraduate)**		
Duration/scheduling	Can be completed in two semesters, though students can take the courses over 4 years. Courses offered in the evenings and weekends.	**Credit/stackability**	Can be embedded within an undergraduate degree.	**Admission requirements**	Applicants must be 18 or over; English language proficiency.
Program description	The Micro-Certificate in Songmaking gives musicians of popular genres intensive training in the essential skills they need to **write, record, produce,** and **promote their music**, all while being mentored by notable industry professionals. Students complete the full complement of courses in order to attain the micro-certificate or can elect to take only the courses that interest them. The Micro-Certificate in Songmaking is **designed to be accessible to working professionals, with classes offered evenings and weekends**. The program provides the essential tools needed to pursue a successful career in music.				
Component courses	MUSC 0100: Songwriting Workshop 1 MUSC 0104: Music Production 1 MUSC 0106: Business of Music MUSC 0108: Music Production 2 MUSC 0110: Songwriting Workshop 2				
Innovative features	*Stackability*: credits earned can be transferred to an undergraduate degree. *Scheduling*: classes are offered in the evenings and weekends to accommodate students who are working. *Scope:* includes a course on the business of music. *Flexibility*: students can complete the program within one year (two semesters) but have four years to complete the program.				

Institution	Université de Montréal	Program title	Mineure en musiques numériques (Undergraduate)		
Duration/scheduling	Can be done part-time or full-time but classes only offered during the day.	**Credit/stackability**	30 credits	**Admission requirements**	DEC and a portfolio.
Program description	The minor in digital music is aimed not only at musicians, but also at students from other disciplines who wish to deepen their knowledge of musical technologies and develop new digital audio tools for music and sound creation. The minor is composed of 9 credits of required courses (see below) and 21 credits of elective courses.				
Component courses	**Required courses**: MUL 3208X Histoire de la musique électro (3 credits) MUS 1300 Acoustique musicale (3 credits) MUS 1321 Analyse, synthèse et traitement des sons (3 credits) **Elective courses :** Includes courses on Electroacoustic composition, Recording fundamentals and techniques, Studio recording and mixing.				
Innovative features	*Flexibility*: offered full time and part time.				
Gaps	*Scheduling:* majority of courses – including two of the required courses – are only offered during the day. *Scope*: no focus on songwriting or all aspects of music production.				

Institution	University of Sherbrooke	Program title	Microprogramme en pratique musicale (Undergraduate)		
Duration/scheduling	Part-time.	**Credit/stackability**	18 credits; credits can be transferred to an undergraduate degree program.	**Admission requirements**	DEC, audition, portfolio and an interview.
Program description	The microprogram consists of 18 credits of required courses which focus on private study in performance and composition. The program aims for students to master the execution of essential technical components related to their musical practice; to demonstrate a good understanding of the fundamental theoretical and musicological elements linked to their musical practice; and to gain practical experience in music.				
Component courses	**Required courses :** MUP 101 Pratique musicale I (3 credits) MUP 102 Pratique musicale II (3 credits) MUP 103 Pratique musicale III (3 credits) MUP 104 Pratique musicale IV (3 credits) MUP 105 Pratique musicale V (3 credits) MUP 106 Pratique musicale VI (3 credits) Click here for learning objectives and course descriptions for each course.				
Innovative features					
Gaps	*Scope:* no focus on Music Production.				

Institution	UQÀM (École préparatoire de musique)	**Program title**	No programs, but offers courses in digital music and music production, and digital audio production of electronic music.		
Duration/scheduling	Between 6-10 hours.	**Credit/stackability**	Standalone course; not for credit.	**Admission requirements**	None
Program description	The two relevant courses offered: **Digital Music and Music Production** This course in digital music and music production focuses on the emerging practice of computer-assisted composition. The program aims to train students in the use of digital tools in musical applications, enabling them to independently compose and produce their own works. The instruction emphasizes fundamental concepts of sound engineering and technology, adapted to the context of music production. **Digital Audio Production of Electronic Music** This workshop aims to introduce students to the digital audio production of electronic music (EDM) using appropriate professional software. The instructor will cover the various musical principles specific to each genre (techno, drum'n bass, dubstep, hip hop, etc.), as well as the technical processes for creating one's own audio productions (beatmaking, sampling, etc.).				
Component courses	(See above)				
Innovative features	*Flexibility*: short courses. *Accessible:* relatively cheap ($270-465); no entry requirements.				
Gaps	*Scope*: no focus on songwriting.				

College offerings (Québec and Canada)

Institution	Vanier CEGEP/College	**Program title**	Professional Music and Song Techniques (DEC)		
Duration/scheduling	3 years,	**Credit/stackability**		**Admission requirements**	DES, Music 502, audition, entrance exam in theory and ear training.
Program description	In this program, students learn to improvise, compose and interpret songs and develop their knowledge of different musical genres. They study music history and theory and master their technique in their principal instrument (or voice). Through courses in software notation and production, students also develop the technical skills needed to work in a professional recording studio. The program offers students two streams: Composition and Arrangement and Performance. In their first year, students take the same courses as those in Pre-university Music.				
Component courses	The **Composition and Arrangement** stream includes the courses: Tech II – Demo Production, Sound Recording I & II. The **Performance** stream includes the courses: Tech II – Demo Production, Studio Musicianship I & II.				
Innovative features	Opportunities to develop performance skills through participation in ensembles.				
Gaps	*Accessibility*: requires full-time, in-person attendance for three years. *Scope*: no direct focus on songwriting.				

Institution	Seneca Polytechnic	Program title	Independent Music Production (Ontario College Certificate)		
Duration/scheduling	2 semesters/eight months.	Credit/stackability		Admission requirements	Ontario Secondary School Diploma (OSSD), music demo – original song or cover.
Program description	Over the course of this eight-month program, students develop the technical, musical and business skills needed to succeed as an independent artist.Taught by some of Canada's top music professionals, the hands-on curriculum is designed to empower students to take on multiple roles in today's dynamic music industry—including writing, performing, producing, marketing and promoting their own work. Students gain practical experience in home-based recording, music production and distribution, as well as songwriting and arrangement. In addition to musical training, the program also equips students with essential business and entrepreneurial skills to help navigate the industry, build a brand and bring creative vision to market with confidence. See here for the program learning outcomes.				
Component courses	Includes: • Two courses on **Songwriting** • Two courses on **Sound and Recording** • Two courses on **Production Mastering**				
Innovative features	*Accessibility*: variation of delivery models – some courses are in-person, some online, some hybrid.				
Gaps	*Cost*: $7605 for Canadian students + $1200 for materials.				

Institution	Seneca Polytechnic	Program title	Independent Songwriting and Performance (Ontario College Certificate)		
Duration/scheduling	2 semesters/eight months.	Credit/stackability		Admission requirements	Ontario Secondary School Diploma (OSSD), music performance video.
Program description	The program is designed to help performers and songwriters develop and refine their skills while laying the foundation for a successful entry into the music industry. This eight-month program focuses on lyrical and melodic composition, performance and vocal skills, music theory and practice, and studio preparation. You'll also receive essential technical and business training to help establish your presence in the marketplace. Learning is hands-on, delivered through a combination of private instruction and traditional classroom lessons, all led by experienced professionals currently working in the music industry. In the final semester, students receive mentorship to complete and showcase a recording project, which will be evaluated by a panel of faculty members. This final evaluation is designed to support the transition into the music industry with practical feedback and guidance.				
Component courses	Includes: • Two courses on **Songwriting** • Two courses on **Lyric Writing** • Two courses on **Studio Prep**				
Innovative features	*Accessibility*: variation of delivery models – some courses are in-person, some online, some hybrid.				
Gaps	*Cost*: $7605 for Canadian students + $1300 for materials.				

International offerings (University and College level)

Institution	**UCLA Extension, Los Angeles, USA**	**Program title**	Certificate in Independent Music Production (Advanced Professional Certificate)		
Duration/scheduling	9 months (FT) though can be taken PT over three years.	**Credit/stackability**	Credits can be transferred towards programs at UCLA	**Admission requirements**	Bachelor's degree not required.
Program description	The program is designed for independent artists, lyric writers, composers, and music producers and prepares students to work on the creative side of the music industry – writing, producing, and recording music in their home studio and doing their own marketing. The program covers the music business, songwriting and producing, encompassing the creative skills needed for projects from inception to finish and the marketing skills necessary for promoting and selling independent work.				
Component courses	A total of 9 courses. Five *required* courses: • Audio Recording Theory • The Record Production Process: Professional Practices • Create and Produce Your Own Music Project • Do-It-Yourself Music Marketing • Entrepreneurship for the Indie Artist One *Production software* course from: • Introduction to Pro Tools • Introduction to Logic Pro One *Songwriting* course from: • Elements of Hit Songwriting • Professional Songwriting for the Commercial Market: A Weekly Workout Two *electives* from a list of 12 options – ranging from Music Publishing: Law and Business to The Insider's Guide to Music Management				
Innovative features	*Accessibility*: PT and FT options. *Scope*: Includes both production and songwriting components. *Career development:* students in the program have access to UCLA's Career resources.				
Gaps	*Accessibility*: $7515USD for domestic students.				

Institution	**California College of Music**	**Program title**	Distance-Learning Certificate of Music Production and Songwriting		
Duration/scheduling	12 months	**Credit/stackability**		**Admission requirements**	High school diploma Audition (video/audio files)
Program description	Students immerse themselves in music production and songwriting classes, songwriting techniques, melody writing, and sound design. Students develop skills in the studio and master the professional techniques essential for crafted, polished, industry-ready music.				
Component courses	Students take a total of 41 courses over 4 quarters. Includes: • 4 courses with a specific focus on *songwriting*. • 6 courses with a specific focus on *music production*. • 2 courses with a focus on the *business* of music – law/copyright, and marketing.				
Innovative features	*Accessibility*: delivered 100% by distance				
Gaps	*Cost*: approximately $12,000USD.				

Institution	**Berklee Online (online extension of the Berklee College of Music), Boston, USA**	**Program title**	Writing and Producing Music (Advanced Professional Certificate)		
Duration/scheduling	Each course lasts 12 weeks and all courses are delivered synchronously online.	**Credit/stackability**	27 credits "Credits *may* be eligible for transfer towards a Bachelor's degree."	**Admission requirements**	None
Program description	Combines songwriting and music production. Students analyze hit songs, write compelling lyrics and melodies, and arrange rhythm-section grooves. Students will produce polished, professional tracks that showcase their creative vision and develop a portfolio of release-ready tracks. Students learn: • To design an efficient writer–producer workflow from idea to final mix, unifying lyric, melody, arrangement, and production decisions • To analyze reference tracks and apply proven groove, arrangement, and vocal production techniques to your songs • To record, edit, and mix professional sessions in Pro Tools and complementary DAWs • To build a cohesive portfolio of release-ready songs that demonstrate stylistic fluency and commercial viability				
Component courses	**6 required courses**: Music Production Analysis Pro Tools 101 Arranging 1: Rhythm Section Arranging and Producing Contemporary Music Styles Commercial Songwriting Techniques Songwriting: Writing Hit Songs **3 elective courses** which include: Music Demo Production for Songwriters; Music Production Fundamentals for Songwriters; and many others.				
Innovative features	*Accessibility*: offered entirely online; no admission requirements. *Scope*: covers both songwriting and music production; very wide range of courses to choose from in the elective group.				
Gaps	*Accessibility*: full certificate costs $14,175USD.				

Institution	**ICMP, London, Liverpool and Leeds, UK**	**Program title**	CertHE Songwriting and Production (Certificate of Higher Education)		
Duration/scheduling	One year. 10-12 hours a week of teaching activities.	**Credit/stackability**	Credits from a CertHE can generally be transferred towards a Diploma of Higher Education (DipHE) or ICMP's BA (Hons) Songwriting and Production program	**Admission requirements**	A levels, Extended Diploma or a BTEC Diploma. "Welcomes applications from mature students who may not have formal qualifications but can demonstrate suitability through experience and skills." Audition and interview.
Program description	The program provides writer-producers with an introduction to songcraft development, creative collaboration and technical music production. Students build strong industry connections as they expand a portfolio of songs and take first steps towards being a professional songwriter, producer and/or beatmaker. Students learn how to produce songs learning foundational production skills across digital audio workstations (DAWs) plus essential recording and mixing skills.				
Component courses	The program comprises 6 modules: • Songwriting Fundamentals: Exploring Songcraft • Songwriting Fundamentals II: Establishing Songcraft • Musician Fundamentals for Writer-Producers • Music Business Fundamentals for Writer-Producers • Production Fundamentals for Writer-Producers				
Innovative features	*Scope*: Covers aspects of both songwriting and music production.				
Gaps	*Accessibility*: £12,250 for international students. No online option.				

Institution	Pointblank, UK	Program title	CertHE Music Production and Songwriting		
Duration/scheduling	1 year FT in person	**Credit/stackability**	The program is the first year of the BA (Hons) Music Production and Songwriting Degree	**Admission requirements**	A levels Audtion/portfolio "If you don't meet the academic requirements, you may still be considered based on your experience, portfolio and demonstrated passion for music."
Program description	The program is designed for aspiring songwriters, producers and composers who want to shape their musical identity, refine their craft and build towards a career in the music industry. The program provides a grounding in the skills, confidence and industry needed for success. Students learn the core principles of songwriting, from lyrical and melodic composition to creating arrangements that captivate listeners. Students gain experience in music production, learning and how to create, produce and market music to a professional standard.				
Component courses	The program is made up of 6 modules: • Either Music Production (Ableton) or Music Production (Logic) • Songwriting Principles • Audio Recording • Music Composition • Music Industry • Songwriting Styles				
Innovative features	*Instructors*: lecturers who bring extensive experience from the music industry – having worked with the likes of Kanye West, Beyonce, Gwen Stefani and Rihanna. *Career opportunities*: regular guest masterclasses with industry professionals, open mic nights, and performance events. Pointblank also runs its own record label that students can submit tracks to. *Accessibility*: flexible entry requirements to attract non-traditional students.				
Gaps					

Section 81.10 Programs and Admission Requirements

General admission requirements are listed in Admission Regulations. Specific requirements for admission to the various programs leading to the BFA degree are set out in the first column of the following listings. They refer to the table of Cegep profiles and other specific requirements defined below.

Profile Requirements

Profile	Requirements
0.00	Diploma of Collegial Studies (DEC — Diplôme d'études collégiales)
10.12	Mathematics 103, 105, 203
A	Interview/Audition
G	Letter of intent
K	Submission of a portfolio of representative work

Programs offered

For information concerning any of the following programs, please consult the calendar section listed opposite each program.

Recommended Profile and Specific Requirements	Program	Calendar Section
	Specializations:	
0.00, A,G	Acting for the Theatre	Section 81.130 School of Performance
0.00, G,K	Art Education – Visual Arts	Section 81.40 Department of Art Education
0.00, 10.12, G,K	Computation Arts	Section 81.90 Department of Design and Computation Arts
0.00	Film and Moving Image Studies	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Film Production	Section 81.60 Mel Hoppenheim School of Cinema
0.00, A	Jazz Studies	Section 81.130 School of Performance
0.00, A	Music Performance	Section 81.130 School of Performance
0.00, A	Music Composition and Production	Section 81.130 School of Performance

0.00, A,G	Performance Creation	Section 81.130 School of Performance
0.00, A,G,K	Scenography	Section 81.130 School of Performance
	Majors:	
0.00, G,K	Art Education – Visual Arts	Section 81.40 Department of Art Education
0.00	Art History	Section 81.50 Department of Art History
0.00	Art History and Film Studies	Section 81.50 Department of Art History, Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Art History and Studio Art	Section 81.50 Department of Art History
0.00, G,K	Ceramics	Section 81.110 Department of Studio Arts
0.00, 10.12, G,K	Computation Arts and Computer Science	Section 81.90 Department of Design and Computation Arts
0.00, A	Contemporary Dance	Section 81.130 School of Performance
0.00, G,K	Design	Section 81.90 Department of Design and Computation Arts
0.00, G,K	Electroacoustic Studies	Section 81.130 School of Performance
0.00, G,K	Fibres and Material Practices	Section 81.110 Department of Studio Arts
0.00	Film and Moving Image Studies	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Film Animation	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Film Production	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Intermedia (Video, Performance and Electronic Arts)	Section 81.110 Department of Studio Arts
0.00, A	Music	Section 81.130 School of Performance
0.00, G,K	Painting and Drawing	Section 81.110 Department of Studio Arts
0.00, G,K	Photography	Section 81.110 Department of Studio Arts
0.00, G,K	Print Media	Section 81.110 Department of Studio Arts

0.00, G,K	Sculpture	Section 81.110 Department of Studio Arts
0.00, G,K	Studio Art	Section 81.110 Department of Studio Arts
	Minors:	
0.00, G,K	Art Education – Visual Arts	Section 81.40 Department of Art Education
0.00	Art History	Section 81.50 Department of Art History
0.00, G	Cinema	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Computation Arts	Section 81.90 Department of Design and Computation Arts
0.00, G,K	Electroacoustic Studies	Section 81.130 School of Performance
0.00	Film and Moving Image Studies	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Film Animation	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G,K	Game Design	Section 81.90 Department of Design and Computation Arts
0.00, Theory Test	Music	Section 81.130 School of Performance
0.00, G,K	Print Media	Section 81.110 Department of Studio Arts
0.00	Theatre	Section 81.130 School of Performance
	Microprograms:	
0.00, G	Fundamentals of Digital Filmmaking	Section 81.60 Mel Hoppenheim School of Cinema
0.00, G	Screenwriting and Film Producing	Section 81.60 Mel Hoppenheim School of Cinema
K	Songwriting and Music Production	Section 81.130 School of Performance
0.00, G	Web Design and User Interface	Section 81.90 Department of Design and Computation Arts

Transfer Students

Applicants who have completed courses in other colleges or universities may be granted transfer credits towards their program at Concordia University. These transfer credits will normally be awarded as general credits and as such may not be equivalent to specific first-year courses at Concordia.

Applicants to a second undergraduate degree must complete a minimum of 60 credits, other than those credited towards the first degree, at least 36 of which must be taken in the new field of specialization (Section 16.2.2 Residence Requirements under Section 16.2 Curriculum Regulations). Students transferring credits towards a first degree must complete a minimum of 45 credits at Concordia (see Section Section 16.2.2 Residence Requirements).

Students must complete all program and degree requirements, as well as the Faculty of Fine Arts residence requirements (see Section 81.20.2 Residence Requirements).

Mature Entry

General admission requirements to the 108-credit program (Mature Entry) are listed in Section 14 Alternative Entry under Mature Entry. Students admitted into the Faculty of Fine Arts through the Mature Entry plan are required to complete 18 credits in addition to the 90 credits normally required for the BFA degree.

Extended Credit Program

Definition of the Extended Credit Program (ECP) is listed in Section 13.2 Definitions. Students admitted to an Extended Credit Program in Fine Arts are required to complete an additional 30 credits for the degree. Transfer credits awarded for Ontario Academic Courses (OACs) must be applied towards the ECP portion of a student's degree program.

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Microprogram in Songwriting and Music Production

Program requirements

Microprogram in Songwriting and Music Production (12 credits)

12 credits:

- MUSI 263 Songwriting I (3.00)
- MUSI 363 Songwriting II (3.00)
- MPRD 201 Music Production Fundamentals I (3.00)
- MPRD 202 Music Production Fundamentals II (3.00)

Notes

Students are responsible for fulfilling their particular program requirements.

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US-2026-3-D17
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Academic Programs Committee (APC) recommendation: New Graduate Microprogram in Global Health Entrepreneurship (HLTH-HLTH-6070)(the "Microprogram")

ACTION REQUIRED: For approval

SUMMARY: Senate is being presented the proposed new Microprogram.

BACKGROUND:

The proposed Microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure that the program is attractive to working professionals and graduate students.

The Microprogram responds to the need to think differently to overcome the biggest challenges and harness the greatest opportunities in health. While traditional medical and public health schools have major roles to play, their mandates often limit the capacity of graduates to mobilize knowledge for scientific and operational breakthroughs in health performance. There is an urgent need for bold thinkers who are equipped to tackle the sector's toughest challenges including unequal access to care, rising safety and security risks, system inefficiencies and the struggle to keep pace with transformative new technologies.

Further details are included in the attached documentation. The APC recommended the Microprogram for Senate's approval at its meeting of April 23, 2026.

DRAFT MOTION:

That, upon recommendation of the Academic Programs Committee, Senate approve the New Graduate Microprogram in Global Health Entrepreneurship (HLTH-HLTH-6070).

PREPARED BY:

Name: Secretary of Senate
Date: May 6, 2026

ACADEMIC PROGRAMS COMMITTEE
Rachel Berger, PhD
April 23, 2026

The Academic Programs Committee requests that Senate consider the following changes for the Undergraduate and Graduate Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposals be forwarded to **Senate for approval:**

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

John Molson School of Business
Department of Accountancy
JMSB-ACCO-6020; **APC-2026-3-D7**

- New Undergraduate Program: Microprogram in Production Accounting for Film and Television
- Summary: The 6-credit microprogram in Production Accounting for Film and Television, in collaboration with the Faculty of Fine Arts, provides learners with the necessary applied accounting knowledge and skills to work as Production Accountants in the film and television industry. It consists of two courses: ACCO 250 (Film and TV Production Accountant) and ACCO 260 (Financial Production Planning / Analysis).

Gina Cody School of Engineering and Computer Science
GCS-GCS-6045; **APC-2026-3-D8**

- New Undergraduate Program: BEng in Artificial Intelligence Engineering
- Summary: The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized AI training. The program will introduce Quebec's first integrated AI engineering pathway and will combine hardware, software, systems integration, and engineering ethics within a single accredited degree. Centered around a virtual AI Engineering Unit that integrates Electrical and Computer Engineering, Computer Science and Software Engineering, and the Concordia Institute for Information Systems Engineering, the curriculum will be full-stack and systems-oriented, moving beyond model development to address deployment, cybersecurity, and trustworthy, regulation-compliant AI.

GCS-GCS-6046; **APC-2026-3-D9**

- New Undergraduate Program: BSc in Artificial Intelligence
- Summary: 90- credit degree designed to provide extensive coverage of diverse AI aspects and the latest technological innovations. The program aims to equip students with both practical skills and a profound theoretical understanding. The BSc program is designed for students seeking a targeted education in specialized AI training that can be completed in a shorter timeframe (compared to the BEng

program). Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) is a 3-year program—compared to 4-year for the BEng in AI, which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into AI careers.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)
School of Health
HLTH-HLTH-6070**; APC-2026-3-D16**

- New Graduate Program: Microprogram in Global Health Entrepreneurship
- Summary: The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Science for Innovators, and HLTH 602- Life Sciences and Digital Health for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Undergraduate Curriculum Proposals (Changes for the 2026-27 Calendar)

Faculty of Arts and Science
Department of Economics
AS-ECON-6026; **APC-2026-3-D1**

- New Undergraduate Program: Microprogram in Economic Policy
- Summary: 12-credit microprogram that will use current resources and course offerings, as the department has always offered Economic policy courses. One course, ECON 318 *Canadian Economic Policy and Institutions*, will be developed as an online offering for 2027-28. This will allow for the possibility for students to take this program entirely remotely. The proposed audience for this microprogram includes: Career professionals in the private sector (e.g., finance, consulting, public affairs, NGOs); Employees of non-governmental and community organizations; Policy analysts and research assistants in government and think tanks; Professionals seeking continuing education in applied economic policy; Recent graduates exploring careers in economic analysis, advocacy, or regulatory environments

Department of Physics
AS-PHYS-6010; **APC-2026-3-D2**

- New Undergraduate Program: Microprogram in Computational Physics
- Summary: 6-credit microprogram aiming to combine training in scientific approach to problem-solving, quantitative rather than qualitative science focus and practical programming skills, with the focus on specific problems and methods that are particularly relevant in sciences and engineering. The basis of admissions is a science DEC or equivalent. Students lacking the proper prerequisites for PHYS 236 *Numerical Methods in Physics with Python* (MATH 204, 205) will be required to complete these prior to enrolling in the course. The

prerequisite for PHYS 440 *Computational Methods in Physics with Python* (PHYS 235, 335, 377) may be waived as the focus of the course is on methods and programming, and brief introductions to the origins of the problems could be provided.

Department of Religions and Cultures
AS-RELI-6011; **APC-2026-3-D3**

- New Undergraduate Program: Microprogram in Religious, Cultural, and Ethnic Literacy
- Summary: 9-credits microprogram aiming to leverage existing courses and create the opportunity to draw in professionals whose work is public-facing who will benefit from taking a few of our courses as professional advancement. Targeting healthcare professionals, but this microprogram should also be relevant to other kinds of professionals who work regularly with diverse populations, including HR professionals, social workers, tech product & UX designers, hospitality/tourism/airline staff, school administrators & teachers, and postsecondary faculty and student-services staff.

AS-RELI-6012; **APC-2026-3-D4**

- New Undergraduate Program: Microprogram in Jewish Studies
- Summary: 9-credit microprogram aiming to leverage existing courses--and existing departmental strength--in the subfield of Judaic Studies. The target audience is adults, primarily in the Jewish community, who take adult education courses, and may be attracted by the sophistication and advanced level of university courses and by the quality and reputation of our faculty in the area.

Faculty of Fine Arts
School of Performance
FA-MUSI-6036; **APC-2026-3-D5**

- New Undergraduate Program: Microprogram in Songwriting and Music Production
- Summary: This microprogram expands offerings in songwriting and music production, targeting prospective students not yet ready to commit to a full BFA, as well as professionals seeking to further develop their skills. It is composed of four existing courses: MUSI 263 Songwriting I, MUSI 363 Songwriting II, MPRD 201 Music Production Fundamentals I, and MPRD 202 Music Production Fundamentals II.

Undergraduate Curriculum Proposals (Changes for the 2027-28 Calendar)

Faculty of Arts and Science
Department of Physics
AS-PHYS-5511; **APC-2026-3-D6**

- New Undergraduate Program: Minor in Physics
- Summary: Program aimed at students whose primary program is in mathematics, chemistry, biochemistry, biology, or psychology, but will be open to anyone possessing appropriate prerequisite knowledge, normally in the form of a Science DEC or equivalent. As this Minor is built from the existing physics

courses (in order to have no/minimal resource implications), it is inevitable that it inherited both the admission requirements and the prerequisite relationships between the courses.

Gina Cody School of Engineering and Computer Science

GCS-COMP-6001; **APC-2026-3-D11**

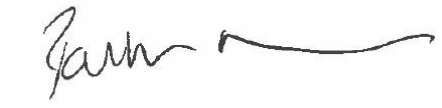
- New Undergraduate Program: Minor in Artificial Intelligence
- Summary: The minor consists of 25 credits of computer science courses that are within the field of artificial intelligence. This Minor can be paired with a wide range of Major programs because its combination of mathematical foundations, programming skills, algorithmic thinking, and applied AI methods complements disciplines across the sciences, engineering, business, social sciences, and the arts.

Graduate Curriculum Proposals (Changes for the Fall 2026 Calendar)

John Molson School of Business

JMSB-CPA-5976; **APC-2026-2-D2**

- Program changes
- Regulation changes
- Course changes
- Summary: The dossier proposes changes to the Graduate Diploma in Chartered Professional Accountancy (CPA) following updates requested by CPA Canada as a result of a revision to their competency framework.



Rachel Berger, PhD
Vice-Provost, Innovation in Teaching and Learning
April 23, 2026

New Graduate Program (Fast Track) - HLTH-HLTH-6070 - VERSION : 2

Summary and Rationale for Changes

The School of Health is proposing a 6-credit Graduate Microprogram in Global Health Entrepreneurship which will provide mid-level professionals with a set of fundamental and data-analytics skills in health sciences and biomedical sciences, combined with entrepreneurship skills, that will empower them to challenge outdated models, design new solutions, and lead meaningful change in health systems in Canada and around the world.

The microprogram responds to the need to think differently to overcome the biggest challenges and harness the greatest opportunities in health. While traditional medical and public health schools have major roles to play, their mandates often limit the capacity of graduates to mobilize knowledge for scientific and operational breakthroughs in health performance. There is an urgent need for bold thinkers who are equipped to tackle the sector's toughest challenges including unequal access to care, rising safety and security risks, system inefficiencies and the struggle to keep pace with transformative new technologies.

The proposed microprogram consists of two 3-credits courses: HLTH 601- Global Health Sciences for Innovators, and HLTH 602- Biomedical Sciences for Innovators, and it will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students.

Resource Implications

The Graduate Microprogram in Global Health Entrepreneurship requires the following resources for its implementation:

- Cost of course instructors for the two new 3-credit courses
- 5k yearly for the first two years of the program for recruitment (LinkedIn campaign)

These resources will be covered by the School of Health.

New Graduate Program (Fast Track) - HLTH-HLTH-6070 - VERSION : 2

Summary of Committee Discussion: CSGS approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Geoffrey Dover, Interim Dean, School of Graduate Studies,
SGSC, 13 Apr 2026

Following the express process approved by the members of the School of Graduate Studies Council, approval of new microprograms are delegated to the Graduate Curriculum Committee. This dossier will be reviewed at the upcoming Graduate Curriculum Committee meeting on April 13, 2026. Details and feedback from the meeting will be uploaded as supporting documentation.

Summary of Committee Discussion: GCC approval

For Submission to:

Rachel Berger, Vice-Provost, Innovation in Teaching and Learning,
APC, 14 Apr 2026

Approved by:

Jordan Lebel, Associate Dean, Academic Programs and Development,
GCC, 13 Apr 2026

Following the express process, this dossier will be reviewed at the upcoming Graduate Curriculum Committee meeting on April 13, 2026. Details and feedback from the meeting will be uploaded as supporting documentation.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Jordan Lebel, Associate Dean, Academic Programs and Development, SGS,
Graduate Curriculum Committee (GCC), 13 Apr 2026

Approved by:

Véronique Pepin, Interim Dean, School of Health,
Council of the School of Health, 30 Apr 2026

Following the express process, this dossier will be reviewed at the upcoming SOH Council meeting on April 30. We mention that the SOH Council has already reviewed and contributed to earlier versions on this proposal. Any substantive feedback following the meeting will be uploaded as supporting documentation.

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Véronique Pépin, Interim Dean, SOH,
Council of the School of Health, 30 Apr 2026

Approved by:

Alexandre Champagne, Associate Dean, Academic Programs and Student Services, SOH,
School of Health Academic Programs Committee (SAPC), 27 Apr 2026

Following the express process, this dossier will be reviewed at the upcoming SAPC (School of Health Academic Programs) committee meeting on April 27. We mention that the SAPC has already reviewed and contributed to earlier versions on this proposal. Any substantive feedback following the meeting will be uploaded as supporting documentation.

Proposal for Microprograms

MICROPROGRAM GENERAL INFORMATION

Microprogram level of study	Graduate
Program name	Microprogram in Global Health Entrepreneurship
Hosting unit(s)	School of Health (SOH)*
Stackability	This microprogram may be combined with various graduate programs in health, AI and business across the University.
Total credit value	6 credits
Leads	This proposal is a collective and concerted effort. It includes meaningful contributions from: Tim Evans (VPRII/JMSB); Judy Nagy (JMSB); Asma Fattoum (JMSB); Paula Lago (GCS); Marie-Julie Favé (FAS); Edna Chosack (District3); Hilary Tabish (consultant); Alex Champagne (SOH); and extensive support from the SGS team.
Proposed start date	Fall 2026
Signatures	Dr. Véronique Pepin / Dr. Tim Evans / Dr. Goeffrey Dover Interim Dean SOH / VPRII / Interim Dean SGS

TARGET AUDIENCE, ADMISSION REQUIREMENTS, COMPETENCIES IN DEMAND, MARKET RESEARCH AND RECRUITMENT STRATEGY (250 words)

The world needs to think differently to overcome the biggest challenges and harness the greatest opportunities in health. While traditional medical and public health schools have major roles to play, their mandates often limit the capacity of graduates to mobilize knowledge for scientific and operational breakthroughs in health performance. There is an urgent need for bold thinkers who are equipped to tackle the sector's toughest challenges including unequal access to care, rising safety and security risks, system inefficiencies and the struggle to keep pace with transformative new technologies. The proposed 6-credit Microprogram in Global Health Entrepreneurship provides mid-level professionals with a set of fundamental and data-analytics skills in health sciences and biomedical sciences, combined with entrepreneurship skills, that will empower them to challenge

outdated models, design new solutions, and lead meaningful change in health systems in Canada and around the world.

Global health entrepreneurship focuses on identifying opportunities, which apply to both developed and developing countries, to improve healthcare and population health by creating value through new services, better processes, or innovative solutions. Our microprogram sees innovation and entrepreneurship as creating value in the health sector through a broad range of institutional forms – private, public, non-governmental, and partnerships – in different stages of maturity and not limited simply to start-ups.

Target audience
The microprogram will target mid-career health professionals with experience in clinical practice, policy, research, and/or management who aim to leverage the core concepts of entrepreneurship, global health, and digital health towards solving complex health challenges across public and private sectors. Specific examples of niche audiences which will be targeted by our publicity and outreach (including via one yearly seminar of the course *Global Health Sciences for Innovators* which will be open to the public):

- Health care professionals
- CIUSSS/CISSS professionals
- The vast Quebec start-up and incubator community
- Quebec medical residents (post-graduate MDs)
- Postdoctoral researchers

Flexible delivery
The microprogram will be offered over 2 terms (8 months) through a hybrid model of alternating in-person and online sessions scheduled in the evenings to ensure the program is attractive to working professionals and graduate students. *After extensive consultations of subject matter experts, we found that the in-person components are essential to (i) achieve the learning objectives of the program, (ii) provide exciting and rewarding experiential learning experiences that will make the program attractive.* The in-person components will include computational skills exercises, peer discussions, case study analysis, and group projects on developing a case study and a business canvas. They will also facilitate networking. The online components will provide flexibility to accommodate the students' varying schedules and learning practices. They will consist of lectures and seminars which can be delivered remotely. A limited number of additional modules may be delivered asynchronously.

Admission requirements
The microprogram will be open to students seeking graduate-level knowledge and training as a means for augmenting or pivoting their careers to become change makers in health. Applicants must have completed an undergraduate degree and must have work experience or advanced training in clinical practice, policy, research or management.

Applicants must meet the following criteria:

- Undergraduate degree from a recognized university
- Have work experience or advanced training in clinical practice, policy, research or management
- Minimum GPA of 3.0
- **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on requirements and exemptions.

Competencies in demand

Canada's health innovation ecosystem is strong in research capacity but is constrained by limited commercialization pathways, a risk-averse funding environment and slow-moving regulatory and procurement systems. The rapid expansion in total health expenditure combined with increasing shortfalls in performance is creating demand for competencies to effectively navigate and negotiate change toward solving complex problems. These "transformative competencies" (Lancet Commission, 2010)[1] are not found in conventional training in clinical medicine and public health. There is an unmet demand for a new generation of health professionals equipped with the entrepreneurial skills to harness innovation and drive bold and strategic breakthroughs in health performance in Canada and beyond.

The proposed microprogram consists of two 3-credits courses: (1) Global Health Sciences for Innovators, and (2) Biomedical Sciences for Innovators. They will equip students with the **competencies** to:

- Asses quantitatively global health sciences and health systems challenges related to the provision, protection, and promotion of health.
- Analyze a broad range of biomedical sciences data types using Bayesian statistical reasoning.
- Integrate and curate biomedical data and electronics health-records data.
- Use biomedical sciences data analytics and AI models to assess and accelerate global health technology transfer.
- Use and design AI and machine-learning biomedical data models to optimize their performance and mitigate their biases for health sciences decision making.
- Map, understand, and evaluate technology value chains across health sciences, including biomedical sciences and complex health systems.

[1] Bhutta ZA, Chen L, Cohen J, et al. Education of health professionals for the 21st century: a global independent Commission. Lancet. 2010 Apr 3;375(9721):1137-8. doi: 10.1016/S0140-6736(10)60450-3. PMID: 20362799.

- Apply foundational concepts of global health entrepreneurship to identify, frame, and address real-world health challenges via case studies.
- Apply an entrepreneurial mindset to develop an original biomedical business canvas integrating market research and prototyping.

The skills to be taught combine quantitative health sciences and biomedical sciences knowledge, population health and health systems knowledge, business acumen, and an understanding of the social impact of health policies and innovations. They will enable students to work across disciplines toward bold solutions to create greater value in health in Canada and beyond. For details on the curriculum of the two courses, see Annex 1.

Market research

In Canada, total health expenditure in 2025 reached approximately $399 billion, reflecting the health sector's position as one of the fastest-growing sectors of both the Canadian and global economies. The scale of the health sector makes effective action on health increasingly dependent on the ability to navigate and negotiate value in a global context. Accordingly, this microprogram adopts a global focus, emphasizing trans-border health risks, shared system challenges and the international dimensions of technology development, financing, regulation and markets.

The proposed microprogram will add value to the university landscape in Quebec and Canada with its novel focus on global health entrepreneurship. It complements domestic-focused health programs by addressing the global dimension of complex health system challenges faced by Canada-based and Quebec-based businesses and policy makers. In Canada, there are only a few similar short graduate programs with comparable formats and none that specifically focus on global health entrepreneurship. Programs with the most closely related curricula are: Queen's Graduate diploma in pharmaceutical & healthcare management & innovation, Dalhousie's Biomedical technology innovation & entrepreneurship certificate and UBC's Micro-certificate in innovation leadership: medical and io-innovations. These are all offered outside Quebec and for the most part delivered in person (see Annex 2 for detailed information).

The proposed Global Health Entrepreneurship microprogram would be the first microprogram opportunity for mid-career professionals in Quebec to learn the core competencies of health entrepreneurship as a means toward creating and scaling new initiatives (in the form of new businesses, services, technical interventions, policies, insights and jobs) that contribute to addressing health challenges of today and tomorrow.

The proposed microprogram has a unique format, being limited to two 3-credit courses (6 credits). This will generate a unique pool of applicants by significantly lowering the barrier for re-entry into a university program for mid-career health professionals. The microprogram would serve as a short and flexible offering for professionals seeking to augment or pivot their careers, as well as a first step for Concordia to lead in the domain of global health entrepreneurship.

Recruitment strategy

The strategy will highlight the microprogram's unique combination of quantitative health sciences knowledge and applied skills with entrepreneurial skills relevant to the health sector and industry, as well as its short duration, moderate cost, access to an excellent network of health professionals and entrepreneurs, and flexible delivery. The SOH/SGS recruitment team will leverage its established practices and expertise to design a compelling landing page, implement an intake form to capture prospective leads, the broad network and the annual conference of the SOH, and use organic outreach channels such as an open-to-the-public annual seminar within the first course (Global Health Sciences for Innovators) to engage the following target audiences:

- D3 startup members and the broader Montreal start-up incubator community
- The broader Montréal and Québec health ecosystems, including policy professionals, researchers, clinicians, and employees of health organizations that have partnered with the SOH in the past
- Current Concordia postdocs and graduate students
- CIUSSS/CISSS professionals

To support the program's launch, the SOH will, for the first two years, cover the costs associated with targeted LinkedIn advertising aimed at health professionals. In addition, the recruitment team will host information sessions to increase awareness, stimulate interest, and expand the applicant pool. The team will also collaborate with University Advancement to feature the microprogram in publications distributed to the alumni network. Facilitation will be offered for francophone students wishing to register in the program, including promoting the University services offered to francophones on the course syllabi and appointing a French-speaking support staff within the SOH (GPA and/or GPD).

EXPERTISE and CAPACITY OF THE UNIT (150 words)

The host units would be the School of Health (SOH). The SOH academic environment is best positioned to offer this program because it has over 100 affiliated faculty members with expertise in health research and teaching, whom are based in all four of Concordia's Faculties (JMSB, GCS, FAS, FoFA).

The expertise of the members covers the content areas of the proposed course: the biomedical sciences, digital health, epidemiology, environmental health, clinical research, medical technologies (MedTech), policy and government, social determinants of health, health interventions, entrepreneurship, and administration. Secondly, because the School does not have departments, it will facilitate collaboration by experts in different fields to tackle transdisciplinary health challenges.

RESOURCE NEEDS (100 words)

We expect to attract 30 students in the first year and grow the enrollment to about 45 students by the second year. With this target in mind, the microprogram requires the following yearly resources. Dr. Veronique Pepin (i/Dean of the SOH) is finalizing with the Deans of JMSB, GCS, and FAS the procedure (MOU) regarding the teaching workload allocations.

Teaching resources	Course lead	6 credits
Admin	GPD	Academic oversight provided by SOH Associate Dean
	GPA	Admin support provided by SOH admin staff
Recruitment	LinkedIn campaign (year 1 and 2)	5k / yr

CONSULTATION (100 words)

Consultations with the following individuals took place over the Summer 2025, Fall 2025, and Winter 2026. Letters of support from external partners are attached in Annex 4. Our consultations have shaped and informed the development of the microprogram:

Concordia community

- Judy Nagy, Lecturer, Management/JMSB
- Dr. Asma Fattoum, Associate Prof., Management/JMSB

- Dr. Sandra Betton, Associate Dean Professional Graduate Programs, JMSB
- Dr. Jordan Lebel, Associate Dean, SGS (and Prof. in Management, JMSB)
- Dr. Paula Lago, Assistant Prof., Electrical and Computer Engineering, GCS
- Dr. Marie-Julie Favé, Associate Prof., Biology, FAS
- Dr. Véronique Pepin, Interim Dean, School of Health
- Dr. Geoffrey Dover, Interim Dean, School of Graduate Studies
- Dr. Alexandre Champagne, Assoc. Dean Academic Programs and Student Services, SOH
- Anna Ehrhardt, Director of Administration, District 3
- Edna Chosack, Health Stream Lead and Coach, District 3
- School of Health Academic Programs Committee including Drs. Yu-Ping Chen (Management/JMSB), Chunjiang An (BCEE, GCS), Emily Coffey (Psychology, FAS), MJ Favé (Biology, FAS), Paula, Lago (ECE,GCS), Christina Grace (HKAP,FAS), Saidul Islam (PhD student, ECE/GCS), A. Champagne (SOH).
- Orly Weinberg, Project Manager, Centre for Applied Synthetic Biology
- Gina Beltrán, Manager Graduate Academic Programs, School of Graduate Studies

External consultations

- Meg Wirth, President and Founder, Maternova
- Dr. Kendal Hoyt, Associate Professor of Medicine, Geisel School of Medicine, Dartmouth College
- Dr. Marija Djekic, Associate Director, Institute for Transforming Healthcare, McGill University
- Annie-Kim Gilbert, President and CEO, MEDTEQ+
- Cédric Bisson, Partner, M.D., J.D., Teralys Capital
- Dr. Matthew Chow, Chief Mental Health Officer, Telus Health
- JA Kaminsky, CEO, SWIFFT Imaging
- Rabia Khan, CEO Serno Bio
- John Meara, Plastic Surgeon-in-Chief, Boston Children's Hospital
- Hilary Tabish, Public Health Consultant

22 April, 2026

Course #1: Global Health Sciences for Innovators

More than $10 trillion is spent on health annually, making it the largest and fastest-growing business sector in the world. But with this rapid expansion comes an urgent need for bold thinkers who can tackle the sector's toughest global challenges: unequal access to care, rising safety and security risks, system inefficiencies, and the struggle to keep pace with transformative new technologies.

A. Course Description

This course covers health sciences knowledge and skills necessary for global health innovators. It discusses the health sciences and population health knowledge underpinning global health systems, it explores quantitative health sciences methods and AI tools to analyze health data, socioeconomic determinants of health, and complex health systems, and it applies these quantitative health sciences knowledge and skills along with entrepreneurship and innovation concepts to make value-added propositions. The course provides a set of health sciences competencies that will empower students to challenge outdated health models, design new solutions, and lead to meaningful change in global health systems. The course includes a term project consisting of analyzing a global health sciences entrepreneurial case study.

B. Format

Hybrid. Alternating in-person meetings (for experiential learning and networking) and online (synchronous) lectures hosting external guest speakers (most of whom are entrepreneurs). It offers a flexible delivery by scheduling the meetings in the evening on a weekday. Asynchronous modules may be assigned as homework.

Seminar-based with workshops, taught/coordinated by one teacher or alternatively by three teachers each covering 4 weeks (FAS/GCS/JMSB).

C. Course Learning Objectives

- Understand the fundamentals of health sciences, global health systems, and population health policy
- Develop quantitative health sciences competencies to assess health and health systems challenges related to the provision, protection, and promotion of health
- Understand the diverse technology value chains from discovery to delivery with particular focus on biomedical sciences and complex health systems design
- Assess and accelerate global health sciences knowledge and technology transfer using data analytics and AI models
- Develop familiarity with core competencies related to entrepreneurship

D. Course Contents

Topics	
I.	Global Health Sciences for Entrepreneurship: Conceptual Foundations and Orientations to Problem Solving in Global Health
II.	Health Sciences Solutions Areas: Provision, Protection and Promotion
III.	Global Health Sciences Innovation Streams
IV.	Integrating Artificial Intelligence into the Health Sciences Innovation Streams: Biomedical Sciences & Complex Health Systems
V.	Core Concepts in Entrepreneurship: Entrepreneurial Mindset, IP, and Business Models
VI.	Final Group Project: Use Health Sciences Knowledge and Skills to Analyze a Global Health Entrepreneurial Case Study

E. Grading (Assessment of Learning)

- The course will be graded on a pass/fail basis.
- Bi-weekly homework will be worth 50% of the final grade.
- The final group project on a written case study and oral presentations will be worth 50%.

April 22, 2026

Course #2: Biomedical Sciences for Innovators

This course builds on the microprogram's first course, *Global Health Sciences for Innovators*, and provides students with quantitative problem-solving skills and knowledge in biomedical sciences to identify unmet needs, evaluate emerging opportunities, and develop impactful solutions toward improving the equitable provision and protection of health.

A. Course Description

The course covers biomedical sciences knowledge and skills necessary for global health innovators. The topics explored include visualization of biomedical sciences data from diverse sources, conditional probability and statistical reasoning to assess health intervention effectiveness and risk, the use of biomedical data AI models (including their performance, limitations, and potential biases), data standards across the biomedical sciences landscape including privacy and ethical concerns, using biomedical sciences knowledge with an entrepreneurial lens to explore the full biomedical innovation pathway, conducting a biomedical sciences industry analysis and market research, prototyping and developing a minimum viable product. The course includes a term project to develop an original biomedical business model canvas.

B. Format

Hybrid. Alternating in-person meetings (for experiential learning and networking) and online (synchronous lectures) for lectures and to host guest speakers. It offers flexible delivery by scheduling the meetings in the evening on a weekday. Asynchronous modules may be assigned as homework.

Lecture-based with workshops, 12 weeks, with three teachers (FAS/GCS/JMSB) covering each 4-weeks of content. Guest speakers, who are entrepreneurs, will be added within each block. There will be an emphasis on practical, problem-based, training and a term project as a pedagogical tool.

C. Course Learning Objectives

1. Analyze a broad range of biomedical sciences data types using Bayesian statistical reasoning
2. Use and design of biomedical sciences AI and machine-learning data models to optimize their performance and mitigate their biases for health decision making.
3. Integrate and curate biomedical data and electronics health-records data.
4. Understand how gene editing and new biomarkers can lead to personalized medicine
5. Understand the biomedical product value chain.
6. Use quantitative biomedical sciences skills and an entrepreneurial mindset to develop an original business canvas integrating market research and prototyping.

D. Course Contents

Topics
1. Framework for Understanding Innovation in Biomedical Sciences
2. Biomedical Sciences Data Landscape
3. Biomedical Data Standards
4. Biomedical Industry Analysis and Market Research
5. Probability Thinking and Health Sciences Decision-Making
6. Decision Making in Health Sciences: AI and Data-Driven Decisions
7. Prototyping and Minimum Viable Product (MVP)
8. Biomedical Sciences: Genomics, Ancestry, and Ethical Health Data Use
9. Multimodal Biomedical Data Harmonization & Integration
10. Presentation of a Business Model Canvas
11. Biomedical Sciences: Molecular Innovation
12. Biomedical Feature Engineering, Digital Biomarker Discovery and Validation

E. Grading (Assessment of Learning)

- The course will be graded on a pass/fail basis.
- Bi-weekly homework will be worth 50% of the final grade.
- The final group project consisting of an original business model canvas written report and oral presentation will be worth 50%.

ANNEX 2

MARKET REPORT

PROPOSED Program/Certificate in Health Entrepreneurship

Prepared by the School of Graduate Studies

This report provides an overview of labour-market conditions, sectoral investment trends, and existing educational offerings relevant to a proposed Global Health Entrepreneurship microprogram at Concordia University. The analysis draws on national health expenditure data, reports on Canada's health-technology and innovation ecosystem, venture funding and commercialization trends, and job-posting data for innovation-oriented roles across the health sector.

KEY FINDINGS

- **Health entrepreneurship environment:** Canada's health-innovation ecosystem is characterized by strong research capacity but constrained commercialization pathways in comparison to the US market. Recent declines in early-stage health-tech investment, combined with capital concentration in later-stage deals, point to a risk-averse funding environment that places greater emphasis on strategic execution, system navigation, and alternative innovation pathways beyond venture financing alone.
- **Career pathways:** Health entrepreneurship training supports careers across a wide range of settings, including health system transformation units, digital health and life-sciences firms, research and commercialization offices, policy and program design roles, social enterprises, and early-stage ventures. These pathways attract professionals from clinical, policy, research, technical, and managerial backgrounds.
- **Program landscape:** Across Québec and Canada, existing graduate-level programs related to health innovation and entrepreneurship are typically multi-course credentials lasting 8 to 16 months, often with discipline-specific prerequisites and a mix of in-person and online delivery.

DEMAND AND SOCIETAL NEED

In Canada, total health expenditures are projected to reach nearly $399 billion in 2025 and represent a significant share of GDP, reflecting ongoing growth in both public and private spending on health services and related activities. Amounts spent continue to rise year over year, with growth rates above general economic expansion in recent reporting periods. This sustained scale of health investing underscores the broad societal and economic importance of the sector[1].

In the innovation ecosystem, entrepreneurial activity related to health technologies and services continues to evolve amid broader economic and funding dynamics. Canada's health-tech sector encompasses startups and scale-ups in areas such as digital health, medtech, and life sciences, though early-stage funding volatility and commercialization is a regional barrier specific to Canada. Reports suggest that health-tech investment is increasingly focused on later-stage companies, while early-stage innovators face regulatory and commercialization challenges. Despite these headwinds, Canada's innovation ecosystems continue to connect clinicians, researchers, designers, and developers around solution-oriented health challenges.

CANADA IN HEALTH TECH LANDSCAPE

Canada's health technology sector, the epicenter of health entrepreneurship, continues to reflect a structural gap between strong academic research capacity and comparatively weaker commercialization outcomes. Health innovation in biotechnology, medical devices, and digital health has historically depended on access to U.S. capital, manufacturing, and markets, a reliance that has become more challenging amid recent geopolitical uncertainty, trade volatility, and supply-chain disruptions. These pressures are compounded by a complex regulatory environment and persistent shortages of early-stage financing; in 2024, venture funding for Canadian health tech declined by approximately 18% overall, with early-stage investment falling by roughly 30% in value and 26% in deal volume[2], while capital increasingly concentrated in later-stage mega-deals. Together, these dynamics point to a health entrepreneurship landscape characterized by constrained commercialization pathways alongside ongoing efforts to translate research into scalable health solutions.

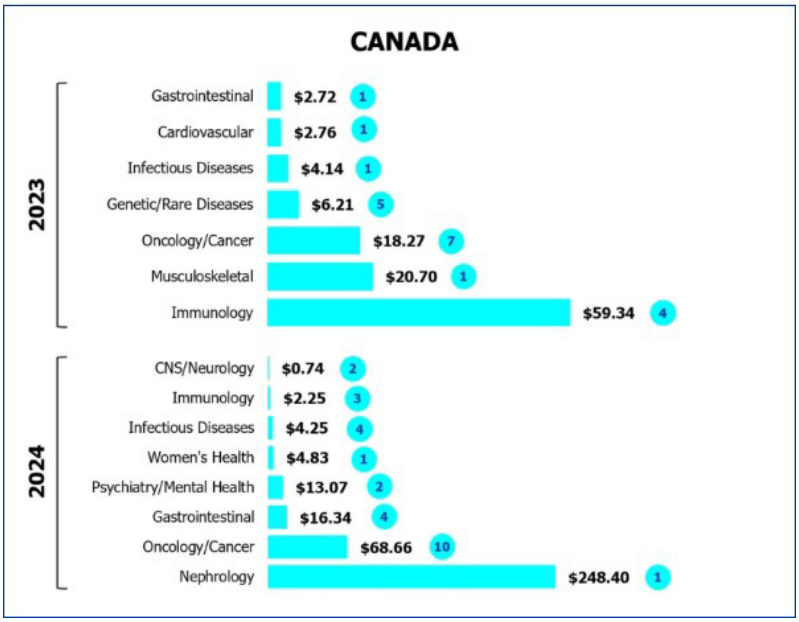
In 2024, investors increasingly avoided high-risk scientific ventures due to long development timelines and substantial R&D costs. Investment interest declined notably in genetic medicines, reflecting small patient populations, manufacturing complexity, and limited commercial returns. As a result, available capital has concentrated in late-stage mega-deals, with 22 percent of all Canadian health sciences funding in 2024 directed to Borealis Biosciences' $248-million Series A round[3].

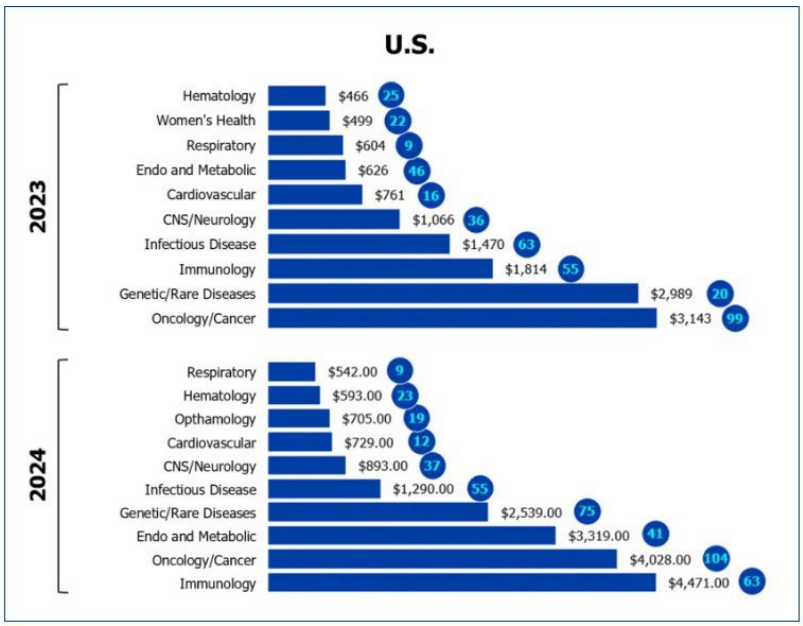
[1] National health expenditure trends, CIHI, 2025
[2] Vital signs: Canada's health tech sector is at a critical juncture - MaRS Discovery District, 2025
[3] idem

Investors gravitate to safe bets

Capital invested across biotech-pharma by indication

($M CAD/number of deals)





Source: MaRS Discovery District, *Vital Signs: Canada's Health Tech Sector Is at a Critical Juncture* (analysis of PitchBook data), 2024.

The Canadian investment graph shows a clear shift toward capital concentration and risk aversion in biotech-pharma investment between 2023 and 2024. While 2023 funding in Canada was distributed across multiple indications (including immunology, oncology, and musculoskeletal), 2024 investment was dominated by a single late-stage nephrology mega-deal ($248.4 million, one deal), with relatively small and fragmented investments elsewhere. Deal counts remain low across most indications, reinforcing that capital is flowing to fewer, larger, later-stage bets rather than early-stage or exploratory science. In contrast, the U.S. investment graph shows substantially larger deal volumes and higher deal counts across multiple therapeutic areas in both years, with sustained investment in oncology, immunology, and genetic

or rare diseases, indicating a deeper and more diversified risk pool and stronger capacity to support innovation across development stages.

For a Health Entrepreneurship microprogram, this contrast highlights the structural conditions facing Canadian health innovators, particularly the need to operate within more constrained and selective funding environments than those available in the U.S. The divergence underscores the importance of equipping learners with entrepreneurial competencies beyond venture financing alone, including navigating risk profiles, leveraging funding, forming strategic partnerships, and pursuing system-embedded innovation pathways. These skills are increasingly relevant for professionals working both within health systems and in venture-oriented settings, where scaling solutions may require alternative models that respond to Canada's comparatively narrower and later-stage-oriented investment landscape.

CAREER PROSPECTS

Graduates with foundational training in health entrepreneurship can pursue or strengthen careers across a broad range of roles situated at the intersection of health systems, innovation, and organizational leadership. These include positions in health system transformation, digital health and innovation units, health policy and program design, life sciences and medtech organizations, social enterprises, and early-stage health ventures. Health entrepreneurship-related career paths are inherently interdisciplinary, attracting professionals with clinical, policy, research, technical, and managerial backgrounds who seek to apply entrepreneurial approaches to complex health challenges within both institutional and market-based settings.

From a labour-market perspective, roles aligned with health entrepreneurship span multiple occupational categories rather than a single profession. Relevant occupations include health policy researchers, consultants, and program officers (NOC 41404), business development and innovation managers (NOC 11200), and health services managers and administrators (NOC 30010), among others. These roles are found across federal and provincial health agencies, regional health authorities, hospitals, research institutes, non-governmental organizations, and private-sector firms operating in digital health, life sciences, and health services.

A concise, Health Entrepreneurship microprogram would therefore serve as:

- an applied upskilling pathway for health professionals seeking to lead or support innovation and system transformation within public, non-profit, or institutional settings;
- a foundational credential for individuals interested in developing, managing, or contributing to health-focused ventures, social enterprises, or public–private partnerships; and
- a complementary qualification for graduate students in fields such as health sciences, engineering, public policy, business, or data science who expect to work in health-adjacent innovation or leadership roles.

SUMMARY OF QUÉBEC AND CANADA HEALTH ENTREPRENEURSHIP MICROPROGRAMS

Across Canada and Québec, existing microprograms in health entrepreneurship or closely related topics typically span 8 to 12 months, include multiple graduate-level courses, and often require prior health-related education, professional experience, or high GPA thresholds. Many also function as stackable credentials that feed into master's degrees (e.g., Dalhousie, University of Calgary). In contrast, Concordia's proposed *Global Health Entrepreneurship* would serve as a short entry point, making it more accessible, lower-cost, and less administratively burdensome than existing programs. No other Canadian university currently offers a compact but comprehensive two-course introductory microprogram. Moreover, no other microprogram takes an approach rooted in *global health* which recognizes that the health industry challenges and solutions are fundamentally transnational.

Graduate programs related to health entrepreneurship in Canada

University + Program Name	Application deadline	Duration	Overview	Admission requirements	Curriculum & Projects	Other components	Delivery mode
Université de Montréal PERCER – Programme d'entrepreneuriat et de commercialisation de la recherche	Jan 11	11 months	10-module health innovation & entrepreneurship program developed in partnership with Millenium Québecor.	Application form + CV (program page)	**Learning objectives: t**o perceive, analyze and develop innovative, marketable solutions that meet the needs of the health and life sciences sector; supporting a strategic vision of knowledge valorization, from financing development stages to product commercialization; to promote the emergence of promising projects for the subsequent phases of business start-up and incubation. **Final project subjects:** pharmaceutical products (medicines, formulations, technological platforms); medical devices (diagnosis, treatment, screening, detection); digital health technologies (data collection, processing and communication); specialized services or innovative business models in healthcare.	Interactive conferences and workshops led by experts from the business and research sectors; bilingual.	In-person
McGill University Graduate certificate in translational biomedical engineering	Jan 15 (International) Jun 21 (Domestic)	1 year	15-credit graduate certificate focusing on translating biomedical technologies (IP, regulation, quality systems).	Bachelor's degree (min 3.0/4.0)	**Courses:** - BMDE 653 Patents in Biomedical Engineering (3 credits) - BMDE 654 Biomedical Regulatory Affairs - Medical Devices (3 credits) - BMDE 655 Biomedical Clinical Trials - Medical Devices (3 credits) + 2 more elective courses in the field of bio med	Oriented toward careers in industry/medtech.	In-person
McGill University Graduate certificate in surgical innovation	Varies by intake; not published.	8-12 months	15-credit certificate on surgical/clinical innovation methods, start up organization and project management	Bachelor's degree (min 3.4/4.0) Preferred: BSc or BEng	**First semester:** team building, needs finding within a clinical environment, needs screening based on business, engineering and clinical perspectives. **Second semester:** prototype development, proof of concept, business plan. **Summer semester:** Internship with an industry partner	Internship with an industry partner.	In-person
University of British Columbia Micro-certificate in	TBD; program is still being developed.	4-5 months	6-credit micro-certificate is a part-time blended program that addresses the gap between	Not disclosed yet	**Curriculum:** The program consists of 2 courses of 10 weeks each. Combined, the courses take 50-70 hours to complete:	2 in-person workshops a the end of the program.	Mostly online,

University + Program Name	Application deadline	Duration	Overview	Admission requirements	Curriculum & Projects	Other components	Delivery mode
innovation leadership: medical and io-innovations			scientific and technological innovations and the practical, legal, and strategic skills needed to bring these innovations to market successfully.		Intellectual Property (IP) Strategy and Management (0404) Unmet Needs in Healthcare: Strategy and Solutions (0405)		workshops in person.
University of Calgary Graduate certificate in precision health	May 31	10 months	Online graduate certificate with specialization options in areas like innovation leadership, applied within precision health context.	Bachelor's degree (min 3.3/4.0) in a health related discipline.	**Course topics:** advanced clinical skills, data science, entrepreneurship, organizational leadership, research, education, professional development, and consultation to impact patient, provider, and health system outcomes.	Laddered credential; specialization option of innovation and entrepreneurship.	Online
Queen's University Graduate diploma in pharmaceutical & healthcare management & innovation	May 15	10 months	Graduate diploma combining coursework + industry insight for careers in pharma/health product and service innovation.	Minimum A- standing required in MD, PharmD, or PhD (biomedical, pharmaceutical, or public health sciences)	**Curriculum:** Students gain foundational understanding of the process and regulatory standards that inform drug development and commercialization in the pharmaceutical healthcare industry.	6-month internship placement.	In-person
Dalhousie University Biomedical technology innovation & entrepreneurship certificate	Year-round (embedded offering)	Varies by student's program	Joint certificate program in biomedical engineering and management, emphasizing innovation, industry needs, and technology commercialization.	Open to current Dalhousie MSc and PhD students in Biomedical Engineering; subject to program admission requirements.	**Courses:** - BMNG 5050.00: Clinical Technologies (3 credits) - BMNG 5210.03: Biomedical Instrumentation, Data Aquisition & Analysis (3 credits) - BMNG 5310.03: Entrepreneurship & the Business of Medical Technology I (3 credits) + 1 more elective course in the field of bio med	Courses completed as part of this certificate may be double-counted towards the requirements of a concurrent degree.	In-person + placement

Annex 3 - Letter #1

mater nova.,

April 23, 2026

Meg Wirth, President and Founder
Maternova
Suite 100, 10 Davol Square
Providence, RI 02903

Dr. Veronique Pepin, Interim Dean, School of Health
Concordia University
Montreal, Quebec, Canada

Dear Dr. Veronique Pepin:

I am writing in strong support of Concordia University's development of course offerings in global health entrepreneurship. As the founder of the first trusted e-commerce platform offering innovative solutions in reproductive, maternal and newborn health for emerging and developing markets, I have observed a strong demand from entrepreneurs for practical training in the tools needed along the value chain to bring their innovative ideas from ideation to market.

I strongly support this microprogram and, as Concordia moves forward, I would welcome the opportunity to collaborate with the team as a guest lecturer in this important and timely curricula.

Sincerely,
Meg Wirth

Annex 3 - Letter #2

McGill | Institute for Transforming Healthcare | Institut pour la transformation des soins de santé

April 22, 2026

Dr. Marija Djekic, Associate Director

Institute for Transforming Healthcare,

McGill University

Montreal, Quebec, Canada

Dr. Véronique Pepin, Interim Dean, School of Health

Concordia University

Montreal, Quebec, Canada

Dear Dr. Pepin,

I am writing in strong support of Concordia University's development of course offerings in global health entrepreneurship. Through my work with the McGill Institute for Transforming Healthcare (ITH), I have observed a clear and growing need for training that integrates health systems insight with innovation and entrepreneurial thinking.

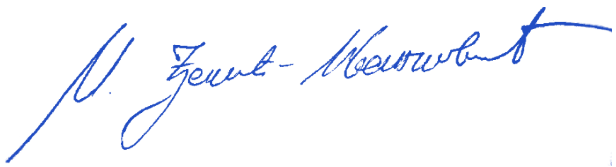
Our research at the McGill ITH focuses on understanding and overcoming key bottlenecks in the performance of healthcare systems. Currently our three priorities include access to primary care, patient flow through emergency departments, and broader coordination challenges related to surgical services. Our work demonstrates that many of these issues extend beyond resource availability, requiring attention to organizational, managerial, and system-level inefficiencies. Addressing these challenges will benefit from intrepid approaches that combine health expertise with the capacity to design, implement, and scale innovative solutions.

In this context, there is a pressing need for educational programs that equip students with the tools to translate system-level insights into practical, scalable interventions. The proposed courses on global health entrepreneurship are therefore both highly relevant and timely. The global focus is particularly important given the opportunity to learn from innovations across borders and the ubiquity of transnational markets for health innovation.

Accordingly, I strongly support this initiative and look forward to opportunities for collaboration as the program develops.

Sincerely,

Marija Djekic



Marija Djekic-Ivankovic PhD MPharm, Associate Director

McGill Institute for Transforming Healthcare, Desautel Faculty of Management, McGill University

3430 McTavish street, 2nd Floor

Montreal (Quebec), H3A 1G1Canada

Email: marija.djekic@mcgill.ca

Annex 3 - Letter #3

Dartmouth Medical School

HANOVER • NEW HAMPSIIIRE

Department of Medicine

April 17, 2026

Dr. Kendall Hoyt, Associate Professor of Medicine
Geisel School of Medicine. Dartmouth College
Hanover, New Hampshire, USA

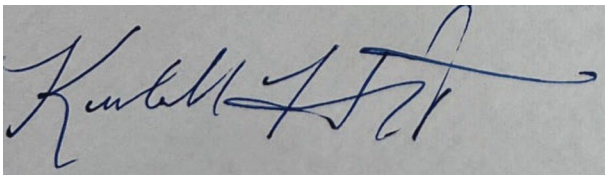
Dr. Veronique Pepin, Interim Dean, School of Health
Concordia University
Montreal, Quebec, Canada

Dear Dr. Veronique Pepin:

I am writing in strong support of Concordia University's development of course offerings in global health entrepreneurship. As a Professor at Dartmouth's Geisel School of Medicine, I have observed a clear and growing demand from students for practical training that integrates health systems, entrepreneurship, and leadership.

The direction of the proposed courses aligns closely with initiatives we have begun to advance at Dartmouth in the health entrepreneurship space, underscoring both their relevance and timeliness. Accordingly, I strongly support this microprogram and, as Concordia moves forward, would welcome the opportunity to collaborate in advancing this important and innovative area of health professional education.

Sincerely,



Dr. Kendall Hoyt

DATE: April 10, 2026

TO: Alexandre Champagne, Associate Dean, Academic Programs and Students Services, School of Health

FROM: Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

SUBJECT: Microprogram in Global Health Entrepreneurship

I am writing following my meeting with i/Provost Dr. Effrosyni Diamantoudi, where she confirmed her support for the proposed Microprogram in Global Health Entrepreneurship. We are very pleased to see a microprogram emerge from the School of Health that capitalizes on internal expertise in both Global Health and Entrepreneurship at Concordia, and connects meaningfully with external partners.

Yours Sincerely,

Dr. Rachel Berger, Vice-Provost, Innovation in Teaching and Learning

Cc:
Dr. Effrosyni Diamantoudi, i/Provost & Vice President Academic
Dr. Tim Evans, Vice President, Research Innovation and Impact
Dr. Véronique Pepin, i/Dean, School of Health
Dr. Geoffrey Dover, i/Dean, School of Graduate Studies
Dr. Jordan Lebel, Associate Dean, Academic Programs and Development, SGS
Dr. Gina Beltran, School of Graduate Studies
Ms. Julie Johnston, Office of the Provost
Mr. Daniel Therrien, Associate Vice President, Integrated Planning, Office of the Provost

Summary of Changes (New Graduate Program (Fast Track))

Course Changes:

	Subject Code Change	Catalo-gue Number Change	Title Change	Descrip-tion Code Change	Prerequi-site Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Compon-ent Change	Mode of Instruct-ion Change	Cross-listed Course Change
HLTH 601 Global Health Sciences for Innovators New	★	★	★	★		★	★	★	★	
HLTH 602 Biomedical Sciences for Innovators New	★	★	★	★		★	★	★	★	

Regulation Changes:

- Admission Requirements Change
- Degree Requirements Change
- Academic Regulations Change

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)
Dossier Title: Microprogram in Global Health Entrepreneurship

Calendar Section Name: Admission Requirements
Calendar Section Type: Regulation
Description of Change: Admission Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: School of Health

Department: School of Health

Calendar publication date: 2026/2027/Summer
Type of change: Regulation Change

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > School of Health Programs > Graduate Microprogram > Global Health Entrepreneurship Microprogram

Present Text calendar	Proposed Text
Admission Requirements	Admission Requirements - Undergraduate degree from a recognized university - Have work experience or advanced training in clinical practice, policy, research or management - Minimum GPA of 3.0 - **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on requirements and exemptions.

Rationale:
The microprogram will be open to students seeking graduate-level knowledge and training as a means for augmenting or pivoting their careers to become change makers in health. Applicants must have completed an undergraduate degree and must have work experience or advanced training in clinical practice, policy, research or management.

Resource Implications:
None.

D1

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)
Dossier Title: Microprogram in Global Health Entrepreneurship

Calendar Section Name: Degree Requirements
Calendar Section Type: Regulation
Description of Change: Degree Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: School of Health

Department: School of Health

Calendar publication date: 2026/2027/Summer
Type of change: Regulation Change

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > School of Health Programs > Graduate Microprogram > Global Health Entrepreneurship Microprogram

Present Text calendar	Proposed Text
Degree Requirements	Degree Requirements Fully-qualified candidates are required to complete a minimum of 6 credits. Please see the School of Health Microprogram Courses page for course descriptions.

Rationale:
Standard degree requirements language in graduate calendar.

Resource Implications:
None.

D2

PROGRAM CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)
Dossier Title: Microprogram in Global Health Entrepreneurship

Calendar Section Name: Global Health Entrepreneurship Microprogram
Calendar Section Type: Program
Description of Change: Global Health Entrepreneurship Microprogram New

Proposed: Graduate Curriculum Changes

Faculty/School: School of Health

Department: School of Health
Program Name:
Program Type: Course-based
Degree: Course-based

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > School of Health Programs > Graduate Microprogram > Global Health Entrepreneurship Microprogram > Degree Requirements

Type of Change: New Program

Present Text calendar	Proposed Text
credits	**6 credits** Global Health Entrepreneurship Microprogram
0	~~0~~ HLTH 601 Global Health Sciences for Innovators (3) HLTH 602 Biomedical Sciences for Innovators (3)

Rationale:

Resource Implications:

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)
Dossier Title: Microprogram in Global Health Entrepreneurship

Calendar Section Name: Academic Regulations
Calendar Section Type: Regulation
Description of Change: Academic Regulations Change

Proposed: Graduate Curriculum Changes

Faculty/School: School of Health

Department: School of Health

Calendar publication date: 2026/2027/Summer
Type of change: Regulation Change

Path: Graduate > See Summer 2026 Graduate Calendar > Programs > School of Health Programs > Graduate Microprogram > Global Health Entrepreneurship Microprogram

Present Text calendar	Proposed Text
Academic Regulations	Academic Regulations - **Academic Standing.** Please refer to the Academic standing section of the Calendar for a detailed review of the Academic Regulations. - **Time Limit.** Please refer to the Academic regulations page for further details regarding the Time Limits . - **Completion Requirement.** To receive a letter of attestation, students must pass all degree requiremets.

Rationale:
Standard academic regulations for graduate microprograms.

Resource Implications:
None.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)
Dossier Title: Microprogram in Global Health Entrepreneurship

Calendar Section Name: HLTH 601
Calendar Section Type: Course
Description of Change: HLTH 601 Global Health Sciences for Innovators New

Proposed: Graduate Curriculum Changes

Faculty/School: School of Health

Department: School of Health

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > School of Health Courses > School of Health Microprogram Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	HLTH 601 Global Health Sciences for Innovators (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
	This course covers health sciences knowledge and skills necessary for global health innovators. It discusses the health sciences and population health knowledge underpinning global health systems, it explores quantitative health sciences methods and AI tools to analyze health data, socioeconomic determinants of health, and complex health systems, and it applies these quantitative health sciences knowledge and skills along with entrepreneurship and innovation concepts to make value-added propositions. The course provides a set of health sciences competencies that will empower students to challenge outdated health models, design new solutions, and lead to meaningful change in global health systems. The course includes a term project consisting of analyzing a global health sciences entrepreneurial case study.
Component(s):	*Component(s):*
	Seminar ; Workshop
Notes :	*Notes :*
Other note :	**Other note :** This course is graded on a pass/fail basis.

Rationale:
This is the first of the two courses that comprise the graduate microprogram. The learning objectives (see course syllabus for details) focus on helping students understand global health systems and policies, while building quantitative and analytical skills to evaluate health challenges and improve care delivery. It also emphasizes technology innovation, data and AI-driven solutions, and entrepreneurial competencies to advance and scale global health initiatives.

Resource Implications:
Cost of instructor for new 3-credit course is covered by the School of Health.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)
Dossier Title: Microprogram in Global Health Entrepreneurship

Calendar Section Name: HLTH 602
Calendar Section Type: Course
Description of Change: HLTH 602 Biomedical Sciences for Innovators New

Proposed: Graduate Curriculum Changes

Faculty/School: School of Health

Department: School of Health

Calendar publication date: 2026/2027/Summer
Planning and Promotion: 01 Jan 0001
Effective/Push to SIS date: 01 Jan 0001
Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2026 Graduate Calendar > Courses > School of Health Courses > School of Health Microprogram Courses

Type of Change: New Course

Present Text calendar	Proposed Text
	HLTH 602 Biomedical Sciences for Innovators (3 credits)
Prerequisites:	*Prerequisites:*
Description :	*Description :*
	The course covers biomedical sciences knowledge and skills necessary for global health innovators. The topics explored include visualization of biomedical sciences data from diverse sources, conditional probability and statistical reasoning to assess health intervention effectiveness and risk, the use of biomedical data AI models (including their performance, limitations, and potential biases), data standards across the biomedical sciences landscape including privacy and ethical concerns, using biomedical sciences knowledge with an entrepreneurial lens to explore the full biomedical innovation pathway, conducting a biomedical sciences industry analysis and market research, prototyping and developing a minimum viable product. The course includes a term project to develop an original biomedical business model canvas.
Component(s):	*Component(s):*
	Lecture ; Workshop
Notes :	*Notes :*
Other note :	**Other note :** This course is assessed on a pass/ fail basis.

Rationale:

This course builds on the microprogram's first course, Global Health Sciences for Innovators, and provides students with quantitative problem-solving skills and knowledge in biomedical sciences to identify unmet needs, evaluate emerging opportunities, and develop impactful solutions toward improving the equitable provision and protection of health.

Resource Implications:

Cost of instructor for new 3-credit course is covered by the School of Health.

D8

Impact Report

Courses

HLTH 601 Global Health Sciences for Innovators New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> School of Health Courses -> School of Health Microprogram Courses
Source of Impact

HLTH 602 Biomedical Sciences for Innovators New
Graduate -> See Summer 2026 Graduate Calendar -> Courses -> School of Health Courses -> School of Health Microprogram Courses
Source of Impact

Other Units

Addition of **Academic regulations** to **Academic Regulations** requirement
Source of other unit Impact

- Sub Section is housed in Academic regulations

Addition of **Time Limits** to **Academic Regulations** requirement
Source of other unit Impact

- Regulation is housed in Academic regulations

Addition of **Academic standing** to **Academic Regulations** requirement
Source of other unit Impact

- Regulation is housed in Academic regulations

Addition of **School of Health Microprogram Courses** to **Degree Requirements** requirement
Source of other unit Impact

- Sub Section is housed in School of Health Microprogram Courses

Addition of **HLTH 601** to **Global Health Entrepreneurship Microprogram** requirement
Source of other unit Impact

- Course is housed in School of Health Microprogram Courses

Addition of **HLTH 602** to **Global Health Entrepreneurship Microprogram** requirement
Source of other unit Impact

- Course is housed in School of Health Microprogram Courses

April 22, 2026

Dr. Véronique Pepin, Interim Dean, School of Health
Concordia University
Montreal, Quebec, Canada

Dear Dr. Pepin:

I am writing in strong support of Concordia University's development of course offerings in global health entrepreneurship.

Over the course of my career that has included roles as a physician on multiple continents working both clinically and in the development of global virtual care offerings as well as digital health and AI tools to improve health, I have been struck by the need to have a greater critical mass of health professionals with entrepreneurial competencies. I am not alone in this regard, and together with colleagues, we recently created the Society of Physician Entrepreneurs.

Over the last several years, I have had the opportunity to engage with Dr. Evans to discuss the development of pedagogic materials in the emerging field of global health entrepreneurship. The direction of the proposed courses aligns closely with our conversations, especially as regards the need to create a specific space for entrepreneurship in health that recognizes the growing global drivers of health and health innovation and understand how context-based entrepreneurial capacity is central to improving health and health systems performance.

As such, I strongly support these new courses as part of a micro-program. As Concordia moves forward, I would welcome the opportunity to collaborate in advancing this important and innovative area of health professional education.

Sincerely,

Dr. Tim Foggin

Dr. Timothy Foggin | Medical Director
MDCM FCFP FRCPC FACHE Cloverdale & South Delta UPCCs
Fraser Health | Better Health. Best in Health Care.
Let's Connect! linkedin.com/timfoggin

We recognize that Fraser Health provides care on the traditional, ancestral and unceded lands of the Coast Salish and Nlaka'pamux Nations and is home to 32 First Nations within the Fraser Salish region. Fraser Health is dedicated to serving all Indigenous people, and honours the unique cultures of the First Nations, Métis and Inuit living within the Fraser Salish region.

April 14, 2026

Dr. Matthew Chow

Chief Mental Health Officer

TELUS Health

Vancouver, British Columbia, Canada

Dr. Véronique Pepin, Interim Dean, School of Health

Concordia University

Montreal, Quebec, Canada

Dear Dr. Véronique Pepin,

I am delighted to see Concordia University moving forward to provide an opportunity for professionals from Canada and beyond to acquire competencies in the area of global health entrepreneurship. Drawing on my experience across the health sector—as a clinician, public administrator, labour leader, and in the private sector—I have witnessed firsthand the significant and growing unmet need for training in health entrepreneurship. In fact, I am writing this letter from Sunnyvale California where I am speaking at an A.I. summit. I see many Canadians here, and they all comment on the opportunity for Canada to step up to train and support the next generation of health entrepreneurs.

The direction of the two courses as presented is a promising seed for growing educational opportunities in global health entrepreneurship. Not only am I fully supportive of this microprogram, I would be honored to contribute as a guest lecturer, as a way of sharing my expertise with the next generation of leaders and change makers in the field of health.

Sincerely,

Dr. Matthew Chow, MD, FRCPC

Chief Mental Health Officer - TELUS Health

Past President (2020-21) - Doctors of British Columbia

US-2026-3-D18
FOR APPROVAL

SENATE
OPEN SESSION
Meeting of May 15, 2026

AGENDA ITEM: Approval of new programs with no resource implication

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve that proposals for new programs with no resource implication be presented to Senate on the Consent agenda.

BACKGROUND:

Mandate of Senate

The Senate is authorized under Article 71 (i) of the University By-laws to consider and approve or deny recommendations from the Faculty and School Councils concerning academic programs.

Review of new programs by the Academic Programs Committee ("**APC**")

The current mandate of the APC, as a standing committee of Senate, includes the study of academic implications of proposals for new program curricula and for modifications to existing curricula and making appropriate recommendations to Senate.

Sometimes, a proposed new program has no resource implications, specifically in terms of additional physical or personnel requirements for the implementation of such new program. Given the APC's role that requires review of the academic implications of new programs, a complete review of the academic considerations is completed when the APC recommends a new program to Senate.

Consent vs. Regular items on an agenda

Dossiers may be presented on the Consent and Regular agenda of a governance body. Matters are included on the Consent agenda when they are of a routine nature and have gone through the relevant governance and review process, prior to final approval. Members of a governance body are at all times allowed to request that a matter presented on the Consent agenda be removed and discussed on the Regular agenda.

Approval of Senate agenda by Senate Steering

The mandate of Senate Steering, as a standing committee of Senate, includes consideration and recommendation of the agenda for Senate meetings. Any items proposed to be included on the Consent and/or Regular agenda of Senate, will be considered and reviewed by Senate Steering. This process allows for Senate Steering to consider and recommend if any items proposed to be included on the Consent agenda should instead be included on the Regular agenda of Senate.

New programs with no resource implication

Where new programs are presented to Senate for approval and have no resource implication, the APC has already reviewed the academic implications of said new program, as noted above. Senate Steering, in reviewing the proposed Senate agenda, would have the opportunity to confirm if an item presented on the Consent agenda should instead be included on the Regular agenda.

Given that an increased number of new program dossiers are being presented to Senate for approval, it is requested that Senate authorize that any new program with no resource implication be included on the Consent agenda of Senate, for its approval.

DRAFT MOTION: That, Senate approve that any new program which has no resource implication shall be included on the Consent agenda of Senate.

PREPARED BY:

Name: Secretary of Senate
Date: April 27, 2026