Senate Undergraduate Council

Open Session

December 9, 2025

1:00 p.m. to 3:00 p.m.

Needles Hall

NH 3318

Waterloo Campus

Think Differently | Act with Purpose | Work Together

2025 12 09 Senate Undergraduate Council Meeting Book

AGENDA

	1. Governance Resources		
	1.1. Link to Governance Resources		
1:00 p.m.	2. Approval of the Agenda and Minutes		
	2.1. Conflict of Interest		
	2.2. Approval of the Agenda and Consent Items	Decision	4
	2.3. Minutes of September 30, 2025 Meeting	Decision	5
	2.4. Business Arising from the Minutes	Information	
	3. Consent Agenda		
	3.1. Curricular Submissions		
	3.1.1. Report from the SUC Curriculum Subcommittee	Information	7
	3.1.2. Faculty of Engineering	Decision	9
	3.1.3. Faculty of Mathematics	Decision	171
	3.1.4. Faculty of Science	Decision	332
	3.2. Accessible Education Project Updates	Information	365
	4. Regular Agenda		
1:05 p.m.	5. Chair's Remarks [DeVidi]	Information	
1:10 p.m.	6. Student Academic Disability Accommodations Policy [Brown & Gillies]		
	6.1. Student Academic Disability Accommodations Policy	Discussion	366
1:30 p.m.	7. Implementing Essential Requirements within Academic Programs [Ellis, Feth, & Skrzydlo]		
	7.1. Implementing Essential Requirements within Academic Programs	Discussion	389
1:55 p.m.	8. Generative AI Consultation [Fieguth & Smith]	Discussion	
2:20 p.m.	9. Senate Alternative Credentials Committee [DeVidi]		
	9.1. Senate Alternative Credentials Committee	Decision	400
2:40 p.m.	10. Items removed from the Consent Agenda		
2:45 p.m.	11. Other Business		
	12. Adjournment		

Next SUC meeting will be on February 4, 2026.

UNIVERSITY OF WATERLOO | Senate

For Approval **Open Session**

To:	Senate Undergraduate Council
From:	Tony Ly Governance Officer
Date of Meeting:	December 9, 2025
Agenda Item:	**2. Approval of the Agenda and Minutes**

2.1. Conflict of Interest

Members are invited to declare any conflicts related to the open session agenda at this time. Should a conflict of interest arise during discussion, members are asked to declare a conflict of interest as it arises. Information and guidance on conflicts of interest is provided on the Secretariat website.

The Secretariat can provide guidance regarding potential conflicts of interest in advance of or during the meeting.

2.2. Approval of the Agenda and Approval of the Consent Agenda

Motion: To approve the agenda as presented/amended, and to approve or receive for information the items on the consent agenda, listed as items 3.1 – 3.2.

Members wishing to have an item removed from consent to the regular agenda are asked to contact the University Secretary in advance of the meeting. Members may also request to have items moved to the regular agenda immediately prior to the approval of the agenda.

2.3. Minutes of the September 30, 2025 Meeting

Motion: To approve the minutes of the meeting as distributed.

Documentation Provided:

- Minutes of the September 30, 2025 Meeting

2.4. Business Arising from the Minutes

None.

University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Minutes of the September 30, 2025 Meeting

Present: Katherine Acheson, Faisal Al-Faisal, Veronica Austen, Makenzie Campbell, Benoit Charbonneau, Victoria Chu, Laura Deakin, David DeVidi [Chair], Tanraj Dulai, Leeann Ferries, Jason Grove, Namrah Hasan, Cathy Newell Kelly, Valery Lai, Tony Ly [Secretary], Carol Ann MacGregor, Sean Meehan, Cynthia Richard, Sharon Roberts, Anoushka Saha, Robert Stark, Victoria Swanson, Johanna Wandel, Richard Wikkerink

Resources/Guests: Rohem Adagbon, Jana Carson, Angela Christelis, Ashley Day, Paul Fieguth, Jennifer Gillies, Danielle Jeanneault, Carrie MacKinnon Molson, Remington Zhi

Regrets: Tom Duever, Vivek Goel, Damian Mikhail, Helena Shilomboleni, William Wong

Organization of Meeting: David DeVidi took the chair and Tony Ly acted as secretary. The secretary advised that quorum was present. The agenda was approved without a formal motion.

1. Conflict of Interest
No conflicts of interest were declared.

CONSENT AGENDA
Council heard a motion to approve or receive for information the items of the consent agenda. Deakin and Charbonneau. Carried.

2. Approval of the Minutes of June 16, 2025 Meeting
Council approved the minutes of the meeting as distributed.

3. Undergraduate Awards and Scholarships
Council approved all new awards and scholarships as presented.

4. Curricular Submissions
Council received for information item 4.1 and approved items 4.2 – 4.5 on behalf of Senate.

REGULAR AGENDA

5. Business Arising from the Minutes
There was no business arising from the minutes.

6. Chair's Remarks
The Chair welcomed new and returning members to the Senate Undergraduate Council. The Chair emphasized the important contributions and participation of student members on this council.

7. Introduction and Orientation
The Chair provided an overview of the scope and mandate of the Senate Undergraduate Council, and Senate Bylaw 2 was reviewed. The Chair noted that this council has evolved over the past several years. A significant portion of the curricular related work is completed by the Faculty Councils and Associate Deans prior to the meeting. The Senate Undergraduate Council has delegated authority from Senate to approve all new undergraduate courses, the deletion of undergraduate courses, and proposed changes to existing undergraduate courses and minor changes to programs.

8. Curricular Submissions

8.2. Faculty of Arts

Acheson presented the proposal from the Faculty of Arts and clarified that the changes to the Economics program is not ready to move forward for approval. Roberts provided an overview of the major modifications for the double degree programs with Renison University College. Members discussed the rationale for the changes to the double degree programs.

A motion was heard to recommend that Senate approve the major plan modifications for the Faculty of Arts and Renison University College double degree programs for Social Development Studies and Bachelor of Social Work, effective September 1, 2026, as presented. Roberts and Acheson. Carried.

8.3. Faculty of Science

Deakin presented the proposal from the Faculty of Science and highlighted that the changes align with current scope of practices and international credentials. Members discussed how the workload was optimized and changes to the academic calendar.

A motion was heard to recommend that Senate approve the submitted retired courses, new courses, course changes, and major modifications to the Doctor of Optometry program, effective September 1, 2026, as presented. Deakin and Richard. Carried.

9. NSSE/FSSE Survey Results

Carson provided a presentation about the NSSE and FSSE survey results. Key discussion points included: U15 survey results; discrepancy between students' and instructors' data; and opportunities for further improvement. The Chair encouraged members to review the survey data and share the results with their colleagues. Members are welcome to contact Carson to request Faculty specific data. Presentation slides will be distributed to members. Communications will be sent out about the next round of data collection.

10. Disability Inclusion Steering Committee (DISCo) Report

Gillies presented the results from the DISCo final report and provided an update on the progress of accessibility standards on campus. Accessibility should be part of operational strategies and budget planning processes. Members discussed approaches to meet accessibility recommendations during times of high budget constraints. It is important that instructors receive updated information, and resources are used effectively to ensure that accessibility standards and legislative requirements are met. Gillies noted that a service model is being developed for different stakeholders on campus, which will help increase awareness about compliance obligations and ensure that support is available to achieve success.

The Chair emphasized that excellent education is accessible education. The Accessible Education Project is receiving two additional years of funding to help instructors remove artificial barriers for students. Gillies clarified that there are differences between accessibility and accommodations. An accessibility steering committee will be established to help plan and collaborate with stakeholders on campus.

11. Other Business

No other items of business were identified.

12. Adjournment

With no further business, the meeting was adjourned. The next meeting will be held on December 9, 2025 from 1:00 p.m. to 3:00 p.m. in NH 3318.

For Approval **Consent Agenda**

To:	Senate Undergraduate Council
Sponsor/Presenter:	David DeVidi, Associate Vice-President, Academic
Date of Meeting:	December 9, 2025
Agenda Item Identification:	3.1.1. SUC Curriculum Subcommittee Report: Consent Agenda for Approval

Recommendation/Motion

To approve the following curricular motions on behalf of Senate, as presented:

i. Faculty of Engineering
To recommend that SUC approve, through its consent agenda, the submitted retired courses, new courses, course changes, and minor plan modifications for the Faculty of Engineering, effective September 1, 2026, as presented.

ii. Faculty of Mathematics
To recommend that SUC approve, through its consent agenda, the submitted new courses, course changes, and minor plan modifications for the Faculty of Mathematics, effective September 1, 2026, as presented.

iii. Faculty of Science
To recommend that SUC approve, through its consent agenda, the submitted retired courses, new course, course changes, and minor plan modifications for the Faculty of Science, effective September 1, 2026, as presented.

Summary

The SUC Curriculum Subcommittee has reviewed and agreed, via an e-vote which closed on December 1, 2025 to recommend to SUC for approval or receive for information as part of the consent agenda, the items included in the subsequent sections of this report (3.1.2 – 3.1.4).

To support easier navigation, items are also available in Kuali Curriculum Management (CM) via the following links. Please review the online guide for additional information about Kuali CM. If you have any issues accessing the links below, please contact Tony Ly, Governance Officer, for support.

i. Faculty of Engineering
ii. Faculty of Mathematics
iii. Faculty of Science

Jurisdictional Information

As provided for in Senate Bylaw 2, section 5.03, council is empowered to make approvals on behalf of Senate for a variety of operational matters:

a. Make recommendations to Senate with respect to rules and regulations for the governance, direction and management of undergraduate studies in the university;

c. Make recommendations to Senate with respect to new undergraduate programs/plans, the deletion of undergraduate programs/plans, and major changes to undergraduate programs/plans.

Governance Path

Senate Undergraduate Council, Curriculum Subcommittee: December 1, 2025 (via e-vote)
Senate Undergraduate Council: December 9, 2025 (prospective)

Documents Included

- 3.1.2. Faculty of Engineering
- 3.1.3. Faculty of Mathematics
- 3.1.4. Faculty of Science

Date 2025/12/01

Show Empty Fields

Meeting Information

Agenda Page TitleSUC - 2025-12 - Consent Agenda - Faculty of Engineering

Career Level
Undergraduate,

Faculty/UnitEngineering

Date2025-12-09 **Time** **Location**

Summary

Undergraduate Studies Submission for SUC - Consent Agenda - December 2025

Other Business

Attachment(s)

Course Proposals

Course Proposal Details

1. Course Retires, New Courses and Course Changes

Course Retire:

BET 470 - Retire Course

CHE 425 - Retire Course

New Courses:

BET 370 - Entrepreneurial Decisions Making with Analytical Tools and AI

CHE 191 - Chemical Engineering Concepts Laboratory

CHE 380 - Sustainability in Chemical Engineering

Course Changes

AE 105 - Consolidate AE/CIVE 280, CIVE 306, and CIVE 204 topics into CIVE 105, focusing it on statics to improve material retention and justify a reduced credit weighting.

AE 204 - Rearrange courses to move 3-D forces to CIVE 105 (statics focus), concentrate shear/bending there, and emphasize solid mechanics in CIVE 204 for better retention.

AE 205 - Changing description to be proper sentences.

AE 400 - Minor edits to course description.

AE 425 - The course description has been changed to reflect what is being delivered in the course, and also add that it is a team-project to align with CEAB requirements.

BET 405 - Prerequisite for the course is being updated from BET 210 to BET 100.

CHE 101 - Separating lab and lecture as different course.

CHE 180 - Change course description.

CHE 181 - Change course description.

CHE 220 - Change title, Abbreviated Title and updated Course Description.

CHE 225 - Change title, Abbreviated Title and updated Course Description.

CHE 241 - Updated Course Description.

CIVE 100 - Changing weight to 0.25 credit increment. Description change.

CIVE 105 - Consolidate AE/CIVE 280, CIVE 306, and CIVE 204 topics into CIVE 105, focusing it on statics to improve material retention and justify a reduced credit weighting.

CIVE 204 - Rearrange courses to move 3-D forces to CIVE 105 (statics focus), concentrate shear/bending there, and emphasize solid mechanics in CIVE 204 for better retention.

CIVE 205 - Changing description to be proper sentences.

CIVE 303 - Shifting CIVE/AE 303 earlier could enhance student understanding of structural behavior by integrating member design applications sooner.

CIVE 400 - Adding a statement about teamwork to description that are currently integrated within the course and align with CEAB requirements.

CIVE 401 - Minor editorial changes to reflect that this is a team-based project.

ENVE 100 - Changing weight to 0.25 credit increment. Description change.
ENVE 330 - Change in title, description and components. Adding an additional fee.

ENVE 400 - Adding a statement about teamwork to description.

ENVE 401 - Minor editorial changes to reflect that this is a team-based project.

GEOE 100 - Changing weight to 0.25 credit increment. Description change.

GEOE 400 - Adding a statement about teamwork to description that are currently integrated within the course and align with CEAB requirements.

GEOE 401 - Minor editorial changes to reflect that this is a team-based project.

MTE 220 - Updated course description.

MTE 380 - Updated course description.

NE 125 - Update course description.

SYDE 322 - Add anti-req.

SYDE 543 - Add anti-req.

Courses: Retire

Code	Title	Type	Workflow Step
BET 470	Family Business	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 425	Strategies for Process Improvement and Product Development	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Courses: New

Code	Title	Type	Workflow Step
BET 370	Entrepreneurial Decision-Making with Analytical Tools and Artificial Intelligence	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 191	Chemical Engineering Concepts Laboratory	Courses	SUC Subcommittee, SUC Curricular Subcommittee

CHE 380	Sustainability in Chemical Engineering	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Courses: Changes

Code	Title	Type	Workflow Step
AE 105	Mechanics 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AE 204	Solid Mechanics 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AE 205	Solid Mechanics 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AE 400	Project Studio 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AE 425	Project Studio 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
BET 405	Digital Leadership and Transformation	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 101	Chemical Engineering Concepts 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 180	Chemical Engineering Design Studio 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 181	Chemical Engineering Design Studio 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 220	Probability and Statistics	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 225	Design of Experiments for Process Improvement	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHE 241	Materials Science and Engineering	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CIVE 100	Civil Engineering Concepts	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CIVE 105	Mechanics 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CIVE 204	Solid Mechanics 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CIVE 205	Solid Mechanics 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CIVE 303	Structural Analysis	Courses	SUC Subcommittee, SUC Curricular Subcommittee

CIVE 400	Civil Engineering Design Project 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CIVE 401	Civil Engineering Design Project 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
ENVE 100	Environmental and Geological Engineering Concepts	Courses	SUC Subcommittee, SUC Curricular Subcommittee
ENVE 330	Environmental Monitoring and Methods	Courses	SUC Subcommittee, SUC Curricular Subcommittee
ENVE 400	Environmental Engineering Design Project 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
ENVE 401	Environmental Engineering Design Project 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
GEOE 100	Environmental and Geological Engineering Concepts	Courses	SUC Subcommittee, SUC Curricular Subcommittee
GEOE 400	Geological Engineering Design Project 1	Courses	SUC Subcommittee, SUC Curricular Subcommittee
GEOE 401	Geological Engineering Design Project 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
MTE 220	Sensors and Instrumentation	Courses	SUC Subcommittee, SUC Curricular Subcommittee
MTE 380	Mechatronics Engineering Design Workshop	Courses	SUC Subcommittee, SUC Curricular Subcommittee
NE 125	Introduction to Materials Science and Engineering	Courses	SUC Subcommittee, SUC Curricular Subcommittee
SYDE 322	Software Design	Courses	SUC Subcommittee, SUC Curricular Subcommittee
SYDE 543	Cognitive Ergonomics	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Programs & Plans Proposals

Programs & Plans Proposal Details

2. Minor Plan Modifications

Chemical Process Modelling, Optimization & Control Specialization - Add CHE523 as available course

Energy and Climate Change Specialization - changes to list 2

ENVE - Water Resources Specialization - changes to list 2

Society Technology and Values Diploma - changes to elective lists

Programs & Plans: Retire No proposals have been added.

Programs & Plans: Major Modifications No proposals have been added.

Programs & Plans: Minor Modifications

Code	Title	Type	Workflow Step
Chemical Process Modelling, Optimization & Control Specialization	Chemical Process Modelling, Optimization and Control Specialization	Programs	SUC Subcommittee, SUC Curricular Subcommittee
Energy & Climate Change Specialization	Energy and Climate Change Specialization	Programs	SUC Subcommittee, SUC Curricular Subcommittee
ENVE-Water Resources Specialization	Water Resources Specialization	Programs	SUC Subcommittee, SUC Curricular Subcommittee
Society, Technology & Values Diploma	Diploma in Society, Technology and Values	Programs	SUC Subcommittee, SUC Curricular Subcommittee

Regulations Proposals

Regulations Proposal Details

Regulations: Retire No proposals have been added.

Regulations: New No proposals have been added.

Regulations: Changes No proposals have been added.

Top

BET 470 - Family Business

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Retire,

Academic Unit Approval
2025-04-15

Last Offering of Course
Never Offered

Retired Impact
No,

Rationale for Change

We attempted to offer this course but there was not enough interest. The instructor who could teach this course is no longer able to and will be retiring and therefore we decided to retire the course as well. We do not see it as being part of our course offering in the near future.

Consultations

Consultation with the Conrad Undergrad Committee took place on April 15, 2025. There was agreement amongst the members that this course should be retired.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Conrad School of Entrepreneurship and Business

Subject Code

BET

Number

470

Course Level

400

Title

Family Business

Abbreviated Title

Family Business

Undergraduate Communication Requirement Identifier

No,

Description

This course explores the business practices needed to manage, run, and work for family-owned ventures. The focus will be on those issues unique to family-businesses such as the interaction between family, management, and ownership. Family-controlled businesses are also characterized by challenges that put their continuity in serious jeopardy; and leadership and succession crises are the norm. Topics include, but are not limited to, the strengths and weaknesses of family businesses, managing family-business conflict, succession planning, professionalization, communication, new opportunity development, and strategic planning.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Lecture

Primary Component

Lecture

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

No Rules

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Course Requirements (no units)

- Entrepreneurial Mindset Specialization - Entrepreneurial Mindset Specialization View Program

CHE 425 - Strategies for Process Improvement and Product Development

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
2

Proposal Details

Proposal Type
Retire,

Academic Unit Approval
2025-02-10

Last Offering of Course

Retired Impact

Retired Impact Details

Fall 2024	Yes,	The course was last offered in Fall 2024 and has been replaced with CHE225. Any student who still needs to take CHE425 can replace this course with CHE225.

Rationale for Change

The course was last offered Fall 2024. There is no reason to keep this course in the undergraduate calendar.

Consultations

The Nanotechnology Engineering Program Director and Statistics Option Coordinator have been informed that this course is no longer offered. CHE225 is already included in the list of courses for both Nanotechnology Engineering and the Statistics Option so this does not impact these programs.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Subject Code	Number	Course Level
CHE	425	400

Title

Strategies for Process Improvement and Product Development

Abbreviated Title

Strategies for Process Improve

Undergraduate Communication Requirement Identifier

No,

Description

A course in practical statistics at a level one step beyond an elementary course. Material includes regression analysis for linear and nonlinear models, analysis of variance, statistical inference, single and multiple comparisons, and an introduction to the design of experiments including single factor designs, multifactor designs, response surface methods, d-optimality (with empirical and mechanistic models), and the analysis

of undesigned data. Applications to process improvement, product development, and research problems will be explored. Use of statistical analysis software to apply these techniques.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
Yes,

Cross-Listed Courses

CHE 225 - Strategies for Process Improvement and Product Development

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Students must be in level 3B or higher
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Statistics Option - Statistics Option

View Program

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)

View Program

Top

BET 370 - Entrepreneurial Decision-Making with Analytical Tools and Artificial Intelligence

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-06-12

Rationale for New Course

This course is designed for undergraduate students interested in entrepreneurship, innovation, business strategy, and practical applications of AI and analytics. It equips students to make smarter, faster decisions in data-rich and uncertain environments. These skills are increasingly critical for launching or managing ventures or driving innovation in today's AI-driven economy.

A recent survey of 96 entrepreneurship-focused students at Conrad revealed strong demand for such a course. When asked what they would like to see added to the curriculum, students highlighted topics like "AI & emerging tech for startups," "how small start-ups survive in the decade of AI," and "courses that break down decisions and outcomes." Others explicitly called for "A.I. and ML for entrepreneurs" and more training in "business analysis" and "responsible innovation." This course will help to meet these requests.

The course complements existing Conrad undergraduate offerings by linking entrepreneurial decision-making with real-world analytics. It deepens the BET program's focus on tech-enabled entrepreneurship and innovation by introducing students to in-demand tools, like predictive analytics, generative AI, and systems thinking. Its interdisciplinary content—drawing on strategy, behavioral economics, systems thinking and computer science—will appeal to students from engineering, science, business, and arts backgrounds. This course also aligns with the university's broader mission of innovation and future-ready education.

Consultations

The proposed course was reviewed and approved by the Undergraduate Committee following discussion. In addition, we consulted undergraduate students more broadly about potential new offerings. A recent survey of 96 entrepreneurship-focused students indicated strong demand for this type of course, with students specifically requesting content related to AI, machine learning, emerging technologies, responsible innovation, and business analysis.

Supporting Documentation

- BET_370_Entrepreneurial decision making with Analytical tools and AI.docx

Course Information

Faculty

Faculty of Engineering

Academic Unit

Conrad School of Entrepreneurship and Business

Subject Code

BET

Number

370

Course Level

300

Title

Entrepreneurial Decision-Making with Analytical Tools and Artificial Intelligence

Abbreviated Title

AI & Entrepreneurial Decisions

Undergraduate Communication Requirement Identifier

No,

Description

This course explores how entrepreneurs and intrapreneurs can improve decision quality under uncertainty by integrating behavioural insights, analytical frameworks, and artificial intelligence. Students examine how heuristics, biases, and bounded rationality shape entrepreneurial judgment, then apply systems thinking, game theory, and dynamic modelling to structure better decisions. The course also introduces predictive and generative AI tools that enhance decision-making in complex, fast-changing environments. Through case analysis, computational modelling, and AI experimentation, students learn to apply these approaches to real entrepreneurial challenges.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Lecture

Primary Component

Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

No Rules

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Notes

- BET100 recommended.

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

There are no dependencies

CHE 191 - Chemical Engineering Concepts Laboratory

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-02-10

Rationale for New Course

Currently CHE101 includes the lab and lecture component of the course. While they are identified as one course in the undergraduate calendar, the course and the lab are run separately (there are even two

separate outlines published). Separating the courses makes things easier logistically and more accurately reflects the workload for this course. Note while it appears we are adding an extra course, the intention is to keep the workload for the students the same. There is no change to the number of AUs.

This proposed new course is lab component of the former CHE101. Note that this change must be accompanied by the revision to the CHE101 course description.

Consultations

Approved at CHE URC meeting on Jan. 29th.

Approved at CHE Department meeting on Feb. 10th.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Subject Code
CHE

Number
191

Course Level
100

Title
Chemical Engineering Concepts Laboratory

Abbreviated Title
Chemical Eng Concepts Lab

Undergraduate Communication Requirement Identifier
No,

Description
A selection of laboratory experiments and exercises designed to reinforce lecture course materials covered in previous and current terms. Topics may include basic thermodynamics, chemical reaction kinetics, and mass and energy balances with the focus on basic engineering measurement techniques, experimental data analyses, and technical report writing.

Units
0.25

Exceptions to Fees or Academic Progress Units
No,

Components
Laboratory

Primary Component
Laboratory

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1B or higher
- Enrolled in H-Chemical Engineering

Corequisites

Completed or concurrently enrolled in:

- CHE101 - Chemical Engineering Concepts 2 (0.50)

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

There are no dependencies

CHE 380 - Sustainability in Chemical Engineering

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-09-15

Rationale for New Course

This course will replace MSE261 Engineering Economics: Financial Management for Engineers in our curriculum. Currently students take a course focused solely on economics with minimal connection to chemical engineering. Environmental and safety considerations are equally important and should be considered alongside economics when considering chemical engineering processes.

Teaching this course provides an opportunity to include costing of chemical engineering equipment (currently in CHE480). Historically (before 2006) this content was covered in CHE44 Economics for Chemical Engineering. It also provides better integration of this content with the capstone design courses (CHE383/CHE482/CHE483) and CHE480: Process Analysis and Design.

Students have expressed interest in a course that better aligns with the chemical engineering program (89% prefer the newly proposed course, Spring 2025 student survey).

The proposed course will aim to develop graduate attributes 8. Professionalism and 9. Impact of Engineering in addition to 11. Economics and Project Management and strengthens our curriculum in the areas of health and safety and sustainable development and environmental stewardship. These areas are required complementary studies components for accreditation (Criteria 3.4.5.1).

Consultations

Shared proposed course outline and met with with Ada Hurst to discuss the impact of this change on MSE (August 2025).

Supporting Documentation

- CHE380 Sustainability in Chemical Engineering Proposed Outline.pdf

Course Information

Faculty

Academic Unit

Faculty of Engineering

Department of Chemical Engineering

Subject Code
CHE

Number
380

Course Level
300

Title
Sustainability in Chemical Engineering

Abbreviated Title
Sustainability

Undergraduate Communication Requirement Identifier
No,

Description
This course introduces students to the three pillars of sustainability: safety, environmental, and economic considerations. Students will identify and quantify how these principles influence the design and optimization of equipment, siting, and operating conditions for chemical processes. Topics include health, safety, and environmental impact in the context of industrial best practices and regulations, risk assessment and management, capital and operating cost estimation of chemical engineering equipment, and economic analysis of project feasibility.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
Department consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 3A or higher
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- MSE261 - Engineering Economics: Financial Management for Engineers (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Dependencies

There are no dependencies

AE 105 - Mechanics 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Rationale:

- Intro to foundations and fluid statics is covered in AE280 and CIVE280
- Thin-walled pressure vessels are covered in CIVE 306
- With these deletions, the course no longer warrants being a “super-course” i.e. 0.75 credits
- This unit weight change should not impact current students as it is a first year course. For students needing to repeat the course, exception or alternative can be worked out with advisor.

- Swap topics with 204 to keep 105 more aligned with statics versus solid mechanics – more focus on fewer topics may aid in retention of material

Consultations

Discussed within CIVE and AE curriculum committee and department meeting.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code
AE

Number
105

Course Level
100

Title
Mechanics 2

Abbreviated Title
Mechanics 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Distributed forces, centroids, and moment of inertia. Basic structural analysis (plane trusses, frames, machines). Three-dimensional force systems, moments, couples, and resultants. Three-dimensional equilibrium problems. Stress-strain-temperature relationships. Behaviour of members in tension, compression, and bending. Friction.

Existing

Description
Distributed forces, centroids, and moment of inertia. Introduction to foundations and fluid statics. Basic structural analysis. Plane trusses. Beam diagrams. Stress-strain-temperature relationships. Behaviour of members in tension, compression, and bending. Thin-walled pressure vessels. Friction.

Proposed

Exceptions to Fees or Academic Progress Units

Units
0.50

Existing

Units
0.75

No,

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - AE104 - Mechanics 1 (0.25)
- Students must be in level 1B or higher
- Enrolled in H-Architectural Engineering, H-Civil Engineering, H-Environmental Engineering, or H-Geological Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - CIVE105 - Mechanics 2 (0.75)
   - **MTE119 - Statics (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- CIVE 460 - Engineering Biomechanics
- AE 204 - Solid Mechanics 1

View Program

View Program

Required Courses (Term by Term)

- H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science - Honours)

View Program

AE 204 - Solid Mechanics 1

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Plastic bending is covered in CIVE/AE 310 and CIVE 413
- Stress transformations covered in 205
- Revise to move 3-D force systems to 105, concentrate on shear and bending – concentrate on statics in 105 and on solid mechanics in 204 – more concentration on fewer topics may aid in retention

Course Information

Faculty
Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code
AE

Number
204

Course Level
200

Title
Solid Mechanics 1

Abbreviated Title
Solid Mechanics 1

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Simple and compound bending and shear stresses in beams. Beam deflection. Torsion of shafts and thin-walled closed sections. Shear, bending moment, and deflection diagrams for beams. Design concepts.

Existing

Description
Three-dimensional force systems, moments, couples, and resultants. Three-dimensional equilibrium problems. Shear stresses in beams. Plastic bending. Beam deflection. Torsion of shafts and thin-walled closed sections. Shear, bending moment, and deflection diagrams for beams. Compound stress and stress transformations. Design concepts.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - AE105 - Mechanics 2 (0.75)
- Complete 1 of the following
  - Complete all of the following
    - Students must be in level 2A or higher
    - Enrolled in H-Architectural Engineering, or H-Civil Engineering
  - Complete all of the following
    - Students must be in level 2B or higher
    - Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- CIVE204 - Solid Mechanics 1 (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- AE 205 - Solid Mechanics 2

View Program

Required Courses (Term by Term)

- H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science - Honours)

View Program

AE 205 - Solid Mechanics 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Some topics covered were not reflected in the course description
- Changing description to be proper sentences.

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Civil and Environmental Engineering

Subject Code
AE

Number
205

Course Level
200

Title
Solid Mechanics 2

Abbreviated Title
Solid Mechanics 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Deflections of beams and trusses, energy methods, principle of virtual work. Introduction to frames, arches, and suspended structures. Analysis of stress and strain, plane problems, theories of failure, buckling of columns.

Existing

Description
Frames, arches, and suspended structures. Stress and strain transformations. Strain energy. Energy methods. Virtual work. Buckling of columns.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - AE204 - Solid Mechanics 1 (0.50)
  - AE221 - Advanced Calculus (0.50)
- Complete 1 of the following
  - Complete all of the following
    - Students must be in level 2B or higher
    - Enrolled in H-Architectural Engineering, or H-Civil Engineering
  - Complete all of the following
    - Students must be in level 3A or higher
    - Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- CIVE205 - Solid Mechanics 2 (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- AE 303 - Structural Analysis

View Program

Required Courses (Term by Term)

- H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science - Honours)
  View Program

AE 400 - Project Studio 1

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Minor edits to course description.

Course Information

Faculty

Academic Unit

Faculty of Engineering

Department of Civil and Environmental Engineering

Subject Code
AE

Number
400

Course Level
400

Title
Project Studio 1

Abbreviated Title
Project Studio 1

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Students undertake a team-based architectural engineering design project during two terms of their program. The purpose of the project is to demonstrate students' abilities to practice in their chosen area of expertise, using knowledge gained from their academic and employment experiences. Projects integrate all relevant aspects (e.g., structure, constructability, mechanical, and enclosure) within appropriate defined social, economic, environmental, political, and technical constraints. Project management and sustainability considerations will be emphasized.

Existing

Description
Students undertake a group architectural engineering design project over two terms of their program. The purpose of the project is to demonstrate students' abilities to practice in their chosen area of expertise, using knowledge gained from their academic and employment experiences. Projects integrate all relevant aspects (e.g., structure, constructability, mechanical, and enclosure) within appropriate defined social, economic, environmental, political, and technical constraints. Project management and sustainability considerations will be emphasized.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Project

Primary Component
Project

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - AE325 - Architectural Engineering Studio 2 (0.50)
- Students must be in level 4A or higher
- Enrolled in H-Architectural Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- AE 425 - Project Studio 2

View Program

Required Courses (Term by Term)

- H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science - Honours)

View Program

AE 425 - Project Studio 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

The course description has been changed to reflect what is being delivered in the course, and also add that it is a team-project. This would align with CEAB requirements.

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Civil and Environmental Engineering

Subject Code
AE

Number
425

Course Level
400

Title
Project Studio 2

Abbreviated Title
Project Studio 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
The course is a continuation of AE400. The final design of the major architectural engineering project proposed in AE400 will be undertaken. The purpose of this phase of the project is to carry out a detailed team-based technical design of the project defined and initiated in AE400.

Requirements of this part of the two-term project include a symposium presentation and a final report.

Existing

Description
Completion of the detailed technical design for the project defined and initiated in AE400. Complete oral presentation, written, and graphics deliverables.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Project

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - AE400 - Project Studio 1 (0.50)
- Students must be in level 4B or higher
- Enrolled in H-Architectural Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science - Honours)
  View Program

BET 405 - Digital Leadership and Transformation Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-05-28

Rationale for Change

The prerequisite for the course is being updated from **BET 210 to BET 100** to better align with the course's foundational learning outcomes. BET 100 provides the essential introductory knowledge and skills required for success in this course, while BET 210 covers more advanced material that is no longer necessary as a prerequisite. This change ensures clearer progression through the curriculum and improves accessibility for students earlier in their academic path.

Consultations

Internal consultations were conducted within the Conrad School of Entrepreneurship and Business to ensure alignment with existing curriculum and departmental objectives. No consultations with external academic units or faculties were necessary for this change. The proposed course does not require prerequisites from other academic units, nor does it involve cross-listing arrangements with external departments.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Conrad School of Entrepreneurship and Business

Subject Code

BET

Number

405

Course Level

400

Title

Digital Leadership and Transformation

Abbreviated Title

Digital Transformation

Undergraduate Communication Requirement Identifier

No,

Description

Firms must continuously evolve and adapt in rapidly changing competitive environments. While investments in new technology are important, this is not the only aspect of successful digital transformation. It requires an understanding of the implications for the firm's products and services as well as its business model, culture, and operations. In this course we examine some of the implications for organizations as they continuously evolve and transform themselves to become and remain responsive and competitive.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Lecture

Primary Component

Lecture

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete 1 of the following
   - Must have completed the following:
   - **BET100 - Foundations of Entrepreneurial Practice (0.50)**
   -
   - Students must be in level 3A or higher
   - ~~BET210 - Business Technology and Infrastructure (0.50)~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

There are no dependencies

CHE 101 - Chemical Engineering Concepts 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-02-10

Rationale for Change

Currently CHE101 includes the lab and lecture component of the course. While they are identified as one course in the undergraduate calendar, the course and the lab are run separately (there are even two separate outlines published). Separating the courses makes things easier logistically and more accurately reflects the workload for this course. Note while it appears we are adding an extra course, the intention is to keep the workload for the students the same. There is no change to the number of AUs.

The proposed revision to the CHE101 course description removes the mention of the lab component and provides a better description of the content taught in the lecture portion of the course.

This motion accompanies the creation of the CHE 191 lab which previously was a component of CHE 101.

Consultations

Approved at the CHE URC meeting on Jan. 29th

Approved at the CHE Department Meeting on Feb. 10th

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Subject Code
CHE

Number
101

Course Level
100

Title
Chemical Engineering Concepts 2

Abbreviated Title
Chemical Eng Concepts 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Introductory application of associated physical and chemical theories for unit operations involving separation, fluid movement, and heat transfer. Material balances for single-component and binary

systems involving vapour-liquid, liquid-liquid, and liquid-solid phase equilibria. Energy balances for mechanical, non-reactive, and reactive systems. Introduction to problem solving techniques for chemical engineering unit operations.

Existing

Description
Development of chemical process analysis skills. Introduction to single- and multi-phase physical equilibria. Material and energy balances in reactive and non-reactive systems. Introduction to investigation and technical communication through laboratory experiments illustrating the physical principles discussed. In the winter term only: brief review of co-op fundamentals.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Proposed

Components

Primary Component
Lecture

Existing

Components

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1B or higher
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)

View Program

CHE 180 - Chemical Engineering Design Studio 1

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-15

Rationale for Change

Provide a more concise course description that better describes the course as currently delivered. PFD and P&ID diagrams were moved to CHE181. Professional development, resume and interview skills are presented in GENE120 lecture time not CHE180. Original plan to include e-portfolios with Pebble Pad was abandoned.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Subject Code
CHE

Number
180

Course Level
100

Title
Chemical Engineering Design Studio 1

Abbreviated Title
Design Studio 1

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
An introduction to chemical engineering professionalism, design, and communication skills. Topics include the design process, computer-aided design (CAD), principles of green engineering, inherently safer design, and occupational health and safety. Students develop teamwork, written communication, and oral communication skills while completing a design project.

Existing

Description
Engineering as a profession. An introduction to the fundamentals of data analysis, investigation, design, and communication in chemical engineering. Introduction to chemical product and process design. Needs analysis and problem identification. Literature search and brainstorming. Design requirements, constraints, and criteria. Development and preliminary evaluation of alternative solutions using software tools. Process synthesis, block diagrams, process flow diagrams (PFD), and piping and instrumentation diagrams (P&ID). Introduction to computer-aided design (CAD). Safety and sustainability in design. Principles of green engineering. Occupational health and safety. Introduction to process safety and process hazard identification. Communication of technical information, written reports, and oral presentations. Teamwork. Professional development, résumé and interview skills, and e-portfolios. Students undertake a term-long design project under the supervision of the instructor.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureSeminarStudioTest Slot

Primary Component
Studio

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1A
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)
  View Program

CHE 181 - Chemical Engineering Design Studio 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Offering Number
1

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-15

Rationale for Change

Provide a more concise course description that better describes the course as currently delivered.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Subject Code
CHE

Number
181

Course Level
100

Title
Chemical Engineering Design Studio 2

Abbreviated Title
Design Studio 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Development of chemical engineering problem analysis, design, and communication skills. Topics include electric circuits, measurements, measurement uncertainty, and signal transmission. Process synthesis, block diagrams, process flow diagrams (PFD), and piping and instrumentation diagrams (P&ID). Students develop teamwork, written communication, and oral communication skills while completing a design project involving prototyping, testing, and verification.

Existing

Description
Development of chemical engineering analysis, investigation, design, and communication skills. Introduction to engineering measurement. Instrument performance characteristics. Electric circuits, current, voltage and resistance, measurements, and signal transmission. Electrical safety. Measurement uncertainty, types of errors, calibration, instrument uncertainty analysis, and error propagation. Measurement of force and load, chemical composition, temperature, pressure and flow. Sensor interfacing and data acquisition using software. Process safety management and inherently safer design. Prototyping, testing, and verification. Communication of technical information, written reports, and oral presentations. Teamwork. Students undertake a term-long design project under the supervision of the instructor.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureSeminarStudioTest Slot

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1B or higher
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)

View Program

CHE 220 - Probability and Statistics

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-02-10

Rationale for Change

Students should have some practice using EXCEL or R to visualize and analyze data. This is typically covered in the course, but is not explicitly included in the course description (this directly relates to the Use of Engineering Tools, GA #5, at the introductory level). The proposed new title more clearly aligns with the course content.

Consultations

Statistics Option Coordinator has been informed of this change. Other Engineering programs will be consulted during FOPS.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Subject Code
CHE

Number
220

Course Level
200

Proposed
Title Probability and Statistics
Existing
Title Process Data Analysis

Proposed
Abbreviated Title Probability & Statistics
Existing
Abbreviated Title Process Data Analysis

Undergraduate Communication Requirement Identifier

No,

Proposed

Description
Introduction to statistical methods for analyzing and interpreting process data. Introduction to statistical ideas, probability theory, distribution theory, sampling theory, confidence intervals, and significance tests. Introduction to regression analysis. Introduction to design of experiments and statistical quality control. An introduction to statistical analysis software.

Existing

Description
Introduction to statistical methods for analyzing and interpreting process data. Introduction to statistical ideas, probability theory, distribution theory, sampling theory, confidence intervals, and significance tests. Introduction to regression analysis. Introduction to design of experiments and statistical quality control.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 2A
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- CIVE 224 - Probability and Statistics
- GEOE 224 - Probability and Statistics
- BME 213 - Statistics and Experimental Design
- ENVE 224 - Probability and Statistics
- NE 215 - Probability and Statistics

View Program View Program View Program View Program

Prerequisites

- MSE 446 - Introduction to Machine Learning
- MSE 543 - Analytics and User Experience

View Program View Program

Antirequisites

- MSE 251 - Probability and Statistics 1

View Program

Prerequisites

- MSE 334 - Operations Planning and Inventory Control
- MSE 431 - Stochastic Models and Methods
- MSE 452 - Decision Making Under Uncertainty
- MSE 551 - Quality Management and Control
- MSE 422 - Economic Impact of Technological Change and Entrepreneurship
- MSE 432 - Production and Service Operations Management

View Program View Program View Program View Program View Program View Program

- MSE 541 - Search Engines

View Program View Program

Course Requirements (no units)

- Statistics Option - Statistics Option

View Program

Required Courses (Term by Term)

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)

View Program

CHE 225 - Design of Experiments for Process Improvement

Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-02-10

Rationale for Change

The revised course description more explicitly describes what is taught in the course. The revised title emphasizes the design of experiments, making it more apparent this is an applied statistics course. The use of statistical analysis software throughout the course emphasizes the expectation of the Use of Engineering Tools (GA #5) at a developed level.

Consultations

The Nanotechnology Engineering Program Director and Statistics Option Coordinator have been informed of this change.

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Chemical Engineering

Subject Code
CHE

Number
225

Course Level
200

Proposed
Title Design of Experiments for Process Improvement
Existing
Title Strategies for Process Improvement and Product Development

Proposed

Abbreviated Title
Experiment Dsgn: Process Impr

Existing

Abbreviated Title
Strategies for Process Improve

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
A course in practical statistics at a level one step beyond a typical introductory course. Material includes regression analysis for linear and nonlinear models, analysis of variance, statistical inference, single and multiple comparisons, blocking (variance reduction techniques) and design of experiments including single factor designs, multifactor designs, fractional factorials and screening designs, and an introduction to response surface methods. Applications to process improvement, product development, and research problems will be explored. Use of statistical analysis software to apply these techniques throughout the course.

Existing

Description
A course in practical statistics at a level one step beyond an elementary course. Material includes regression analysis for linear and nonlinear models, analysis of variance, statistical inference, single and multiple comparisons, and an introduction to the design of experiments including single factor designs, multifactor designs, response surface methods, d-optimality (with empirical and mechanistic models), and the analysis of undesigned data. Applications to process improvement, product development, and research problems will be explored. Use of statistical analysis software to apply these techniques.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Proposed

Is this course cross-listed?
No,

Existing

Is this course cross-listed?
Yes,

Proposed

Is this course cross-listed?
No,

Existing

Is this course cross-listed?
Yes,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Proposed

Consent to Drop
Department consent required,

Existing

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Students must be in level 2B or higher
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Statistics Option - Statistics Option

View Program

Required Courses (Term by Term)

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)

View Program

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)

View Program

Top

CHE 241 - Materials Science and Engineering

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-04-14

Rationale for Change

Phase diagrams of condensed materials are sometimes taught in CHE241. With the planned removal of CHE231 from the curriculum, this content should be explicitly included in the CHE241 course description. In addition to this, a discussion with recent CHE241 instructors resulted in a more detailed and specific course description.

Consultations

No consultation necessary.

Course Information

Faculty

Academic Unit

Faculty of Engineering

Department of Chemical Engineering

Subject Code
CHE

Number
241

Course Level
200

Title
Materials Science and Engineering

Abbreviated Title
Materials Sci & Eng

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
An introduction to the structure, properties, and processing of materials including metals, ceramics, and polymers. Fundamentals of structure including atomic bonding, crystalline structure, crystal defects, and non-crystalline structure. Mechanical, electrical, and thermal properties of materials. Phase diagrams of condensed materials such as liquids, metals, alloys, and ceramics. Structural control and material processing for the engineering design of materials.

Existing

Description
Fundamentals; atomic bonding, crystalline structure, crystal defects, non-crystalline materials; structure and properties of metals, ceramics, glasses, semi-conductors. Amorphous materials, polymers, composites. Processing and concepts of engineering design of materials.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 2B
- Enrolled in H-Chemical Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Antirequisites

- NE 125 - Introduction to Materials Science and Engineering

View Program

Required Courses (Term by Term)

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)

View Program

CIVE 100 - Civil Engineering Concepts

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Being consistent with the faculty level at making courses in 0.25 credits increments.
- This unit weight change should not impact current students as it is a first year course. For students needing to repeat the course, exception or alternative can be worked out with advisor.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code

CIVE

Number

100

Course Level

100

Title

Civil Engineering Concepts

Abbreviated Title

Civil Engineering Concepts

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

An introduction to engineering concepts for first-year Civil Engineering students including site design, design visualization, and public stakeholder communication. Laboratory sessions expose students to traditional field surveying, modern topographic surveying, engineering graphics, guidelines and regulations, and design visualization. Introduction to the practice and ethics of professional engineering, including licensure and accreditation.

Existing

Description

An introduction to the fundamental methods, principles, and skills of civil engineering. Fundamentals of technical communication, the engineering design process, and problem solving. Completion of a pre-design study and report for a civil engineering project. Independent and team work. Fundamentals of engineering computation: units, data collection, measurement, and error analysis. Field surveying (automatic level, engineer's transit, differential Global Positioning System

(GPS), total station). Laboratory on engineering graphics auto-computer assisted diagnosis (Auto CAD) and computational software (Excel, Matlab). Aspects of the engineering profession (code of ethics, negligence, misconduct, role of the Professional Engineers Ontario (PEO), etc.), diversity in the workplace, and professional development. Preparation for the University of Waterloo co-operative education program (Co-operative and Experiential Education, résumé writing, job search, and interview skills).

Proposed
Units 0.75
Existing
Units 0.80

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1A
- Enrolled in H-Civil Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours) View Program

CIVE 105 - Mechanics 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Rationale:

- Intro to foundations and fluid statics is covered in AE280 and CIVE280
- Thin-walled pressure vessels are covered in CIVE 306
- With these deletions, the course no longer warrants being a “super-course” i.e. 0.75 credits
- This unit weight change should not impact current students as it is a first year course. For students needing to repeat the course, exception or alternative can be worked out with advisor.
- Swap topics with 204 to keep 105 more aligned with statics versus solid mechanics – more focus on fewer topics may aid in retention of material

Consultations

Discussed within CIVE and AE curriculum committee and department meeting.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code
CIVE

Number
105

Course Level
100

Title
Mechanics 2

Abbreviated Title
Mechanics 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Distributed forces, centroids, and moment of inertia. Basic structural analysis (plane trusses, frames, machines). Three-dimensional force systems, moments, couples, and resultants. Three-dimensional equilibrium problems. Stress-strain-temperature relationships. Behaviour of members in tension, compression, and bending. Friction.

Existing

Description
Distributed forces, centroids, and moment of inertia. Introduction to foundations and fluid statics. Basic structural analysis. Plane trusses. Beam diagrams. Stress-strain-temperature relationships. Behaviour of members in tension, compression, and bending. Thin-walled pressure vessels. Friction.

Proposed

Units

Exceptions to Fees or Academic Progress Units
No,

0.50

Existing

Units
0.75

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:

- CIVE104 - Mechanics 1 (0.25)
- Students must be in level 1B or higher
- Enrolled in H-Civil Engineering, H-Environmental Engineering, or H-Geological Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AE105 - Mechanics 2 (0.75)**
   - **MTE119 - Statics (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- CIVE 460 - Engineering Biomechanics View Program

Antirequisites

- MTE 119 - Statics View Program
- AE 105 - Mechanics 2 View Program

Prerequisites

- AE 280 - Fluid Mechanics and Thermal Sciences View Program
- CIVE 204 - Solid Mechanics 1 View Program
- CIVE 280 - Fluid Mechanics View Program
- CIVE 382 - Hydrology and Open Channel Flow View Program
- GEOE 280 - Fluid Mechanics View Program
- ENVE 280 - Fluid Mechanics View Program
- ENVE 382 - Hydrology and Open Channel Flow View Program

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours) View Program
- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) View Program

Course Lists

- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours) View Program

CIVE 204 - Solid Mechanics 1

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Plastic bending is covered in CIVE/AE 310 and CIVE 413
- Stress transformations covered in 205
- Revise to move 3-D force systems to 105, concentrate on shear and bending – concentrate on statics in 105 and on solid mechanics in 204 – more concentration on fewer topics may aid in retention

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code

CIVE

Number

204

Course Level

200

Title

Solid Mechanics 1

Abbreviated Title

Solid Mechanics 1

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

Simple and compound bending and shear stresses in beams. Beam deflection. Torsion of shafts and thin-walled closed sections. Shear, bending moment, and deflection diagrams for beams. Design concepts.

Existing

Description

Three-dimensional force systems, moments, couples, and resultants. Three-dimensional equilibrium problems. Shear stresses in beams. Plastic bending. Beam deflection. Torsion of shafts and thin-walled closed sections. Shear, bending moment, and deflection diagrams for beams. Compound stress and stress transformations. Design concepts.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

LectureTest Slot Tutorial

Primary Component

Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - CIVE105 - Mechanics 2 (0.75)
- Complete 1 of the following
  - Complete all of the following
    - Students must be in level 2A or higher
    - Enrolled in H-Civil Engineering
  - Complete all of the following
    - Students must be in level 2B or higher
    - Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AE204 - Solid Mechanics 1 (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- ARCH 276 - Timber: Design, Structure and Construction — View Program

Antirequisites

- AE 204 - Solid Mechanics 1 — View Program

Prerequisites

- CIVE 205 - Solid Mechanics 2 — View Program

Antirequisites

- BME 281 - Mechanics of Deformable Solids — View Program
- MTE 219 - Mechanics of Deformable Solids — View Program
- SYDE 286 - Mechanics of Deformable Solids — View Program

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours) — View Program
- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) — View Program

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours) — View Program

CIVE 205 - Solid Mechanics 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Some topics covered were not reflected in the course description
- Changing description to be proper sentences.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code
CIVE

Number
205

Course Level
200

Title
Solid Mechanics 2

Abbreviated Title
Solid Mechanics 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Deflections of beams and trusses, energy methods, principle of virtual work. Introduction to frames, arches, and suspended structures. Analysis of stress and strain, plane problems, theories of failure, buckling of columns.

Existing

Description
Frames, arches, and suspended structures. Stress and strain transformations. Strain energy. Energy methods. Virtual work. Buckling of columns.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?

No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - CIVE204 - Solid Mechanics 1 (0.50)
  - CIVE221 - Advanced Calculus (0.50)
- Complete 1 of the following
  - Complete all of the following
    - Students must be in level 2B
    - Enrolled in H-Civil Engineering
  - Complete all of the following
    - Students must be in level 3A
    - Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AE205 - Solid Mechanics 2 (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- CIVE 306 - Solid Mechanics 3
- ARCH 276 - Timber: Design, Structure and Construction View Program View Program

Antirequisites

- AE 205 - Solid Mechanics 2 View Program

Prerequisites

- CIVE 303 - Structural Analysis
- CIVE 310 - Introduction to Structural Design View Program View Program

Course Requirements (no units)

- Soil, Rock & Structures Specialization - Soil, Rock and Structures Specialization View Program

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours) View Program

Course Lists

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) View Program

CIVE 303 - Structural Analysis

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Offering Number
1

Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Exposure to engineering/member design earlier
- 303 is typically the hardest course in the hardest term – could have good impact on students by moving back a term
- Could have positive impact in outcomes – students may have better grasp of moment diagrams/behaviour of structures if they see application in member design in CIVE/AE310

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Civil and Environmental Engineering

Subject Code
CIVE

Number
303

Course Level
300

Title
Structural Analysis

Abbreviated Title
Structural Analysis

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Analysis of statically indeterminate structures using force and displacement methods. Influence lines for determinate and indeterminate structures. Introduction to the matrix stiffness method. Computer applications using commercial structural analysis software.

Existing

Description
Analysis of statically indeterminate structures using force and displacement methods. Influence lines for indeterminate structures. Introduction to the matrix stiffness method. Computer applications using commercial structural analysis software.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - CIVE205 - Solid Mechanics 2 (0.50)
- Students must be in level 3A or higher
- Enrolled in H-Civil Engineering, or H-Geological Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AE303 - Structural Analysis (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- AE 303 - Structural Analysis

View Program

Prerequisites

- CIVE 505 - Structural Dynamics

View Program

Course Requirements (no units)

- Soil, Rock & Structures Specialization - Soil, Rock and Structures Specialization

View Program

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours)

View Program

Course Lists

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours)

View Program

CIVE 400 - Civil Engineering Design Project 1

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Description does not align with the course delivery.

Adding a statement about teamwork that are currently integrated within the course and align with CEAB requirements.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code

CIVE

Number

400

Course Level

400

Title

Civil Engineering Design Project 1

Abbreviated Title

Design Project 1

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

Students must undertake a team-based civil engineering design project during the last two terms of their program. The purpose of the project is to demonstrate students' abilities to practice in a civil engineering capacity in their chosen area of expertise, using knowledge gained from their academic and employment experiences. Typically, experiential learning opportunities are incorporated to support undergraduate students in developing and advancing their teamwork skills. The first part of the project (CIVE400) will include problem identification, generation and selection of solutions, and project management. Incorporation of technical, ecological, social, political, and economic issues in the solution for the project will be required. Sustainability considerations will be emphasized. Requirements include proposal, progress report, oral presentation, and a final report containing design recommendations for part two of the project, CIVE401.

Existing

Description

Students must undertake an independent civil engineering design project during the last two terms of their plan. The purpose of the project is to demonstrate students' abilities to practise in a civil engineering capacity in their chosen area of expertise, using knowledge gained from their academic and employment experiences. The first part of the project (CIVE400) will include problem identification, generation and selection of solutions, and time management. Incorporation of technical, ecological, social, political, and economic issues in the solution for the project will be required. A basic requirement of the proposed solution is that it must be compatible with the

principles of sustainability. Requirements include proposal, progress report, oral presentation, and a final report containing recommendations for part two of the project, CIVE401.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureProject

Proposed
Primary Component Project
Existing
Primary Component Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 4A
- Enrolled in H-Civil Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option [View Program]

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours) [View Program]

CIVE 401 - Civil Engineering Design Project 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Minor editorial changes to reflect that this is a team-based project. Added CIVE 400 as a pre-req, as these courses cover a two-term project.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code

CIVE

Number

401

Course Level

400

Title

Civil Engineering Design Project 2

Abbreviated Title

Design Project 2

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

The course is a continuation of CIVE400. The final design of the major civil engineering project proposed in CIVE400 will be undertaken. The purpose of this phase of the project is to carry out a team-based detailed technical design of the solution proposed in CIVE400. Requirements of this part of the two-term project include a symposium presentation and a final report.

Existing

Description

A continuation of CIVE400. The final design of the major civil engineering project proposed in CIVE400 will be undertaken. The purpose of this phase of the project is to carry out a detailed technical design of the solution proposed in CIVE400. Requirements of this part of the two-term project include a symposium presentation and a final report.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Project

Primary Component

Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed the following:**
   - **CIVE400 - Civil Engineering Design Project 1 (0.50)**
   -
   - Students must be in level 4B
   - Enrolled in H-Civil Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option

View Program

Required Courses (Term by Term)

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours)

View Program

ENVE 100 - Environmental and Geological Engineering Concepts

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-18

Rationale for Change

- Being consistent with the faculty level at making courses in 0.25 credits increments.
- This unit weight change should not impact current students as it is a first year course. For students needing to repeat the course, exception or alternative can be worked out with advisor.
- Course has been changed to be design-focused courses with significant hands-on learning and field components. Intended to be part of a 'design spine' or 'environmental studios' that includes ENVE 200.
- Descriptions are out of date
- ENVE 100 has been modernized with new surveying tools and a 'flipped' format where students are looking through guidelines, working with software such as CIVIL 3D for survey renderings. Students produce a poster for visualization. Material about resume writing, etc has been moved to PD courses.

Consultations

no consultations were necessary

Course Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Subject Code
ENVE

Number
100

Course Level
100

Title
Environmental and Geological Engineering Concepts

Abbreviated Title
Concepts: Env & Geol Eng

Undergraduate Communication Requirement Identifier

No,

Proposed

Description
An introduction to engineering concepts for first-year Environmental and Geological Engineering students including site design, design visualization, and public stakeholder communication. Laboratory sessions expose students to traditional field surveying, modern topographic surveying, engineering graphics, guidelines and regulations, and design visualization. Introduction to the practice and ethics of professional engineering, including licensure and accreditation.

Existing

Description
An introduction to the fundamental methods, principles and skills of environmental and geological engineering. Fundamentals of technical communication, the engineering design process and problem solving. Completion of a pre-design study and report for an environmental engineering project. Independent and team work. Fundamentals of engineering computation units, data collection, measurement, and error analysis. Field surveying (automatic level, engineer's transit, differential global positioning system (GPS), total station). Laboratory on engineering graphics auto-computer assisted diagnosis (Auto CAD) and computational software (Excel, Matlab). Aspects of the engineering profession (code of ethics, negligence, misconduct, role of the Professional Engineers Ontario (PEO), etc.), diversity in the workplace, and professional development. Preparation for the University of Waterloo co-operative education program (Co-operative and Experiential Education, résumé writing, job search, and interview skills).

Proposed

Units
0.75

Existing

Units
0.80

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
Yes,

Cross-Listed Courses

GEOE 100 - Environmental and Geological Engineering Concepts

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1A
- Enrolled in H-Environmental Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- ENVE 200 - Sustainability Analysis and Solutions

View Program

Required Courses (Term by Term)

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours)
- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours)

View Program

View Program

ENVE 330 - Environmental Monitoring and Methods

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-18

Rationale for Change

Course has been changed to be design-focused courses with significant hands-on learning and field components. Intended to be part of a 'design spine' or 'environmental studios' that includes ENVE 200.

Descriptions are out of date.

ENVE 330 has also been reworked in anticipation of it moving to a design format. Ran last 2 years as a field-based and concentrated course in the summer term and the expectations need to be clarified and communicated to the students and other instructors in that term. There is now a fee associated with the course, similar to other field courses in EARTH.

Consultations

No consultations were necessary

Supporting Documentation

- Spring 2025_ Lab Analysis and Field Sampling Techniques.pdf

Course Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Subject Code
ENVE

Number
330

Course Level
300

Proposed

Title

Environmental Monitoring and Methods

Existing

Title
Lab Analysis and Field Sampling Techniques

Proposed

Abbreviated Title
Env Monitoring & Methods

Existing

Abbreviated Title
Lab Anal & Field Sample Tech

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
A design course focused on physical and chemical measurements of the environment. Development of skills in defining and characterizing appropriate spatial and temporal resolution scales of environmental sampling. Elements of air, surface water, groundwater and soil sampling techniques and devices. Contemporary laboratory methods including colorimetry, gas chromatography, spectroscopy, electrochemical probes and grain size analysis. A focus on hands-on learning in immersive field camps and application of knowledge to open-ended design problems.

Existing

Description
An introduction to the fundamental concepts of physical and chemical measurement of the environment. Review of basic statistics, quality assurance and control, sources of error, seasonal effects, sample preservation. Practical and essential elements of water, soil and air sampling. Introduction to measurement techniques including: colorimetry, chromatography, spectroscopy, electrochemical probes, remote sensing. Design of monitoring strategies, and use of methods to assess validity of laboratory data.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Proposed

Components

Existing

Components

Proposed

Primary Component
Laboratory

Existing

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 3A
- Enrolled in H-Environmental Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Proposed

Fee Statement
This course may have additional fees. See academic unit for details.

Existing

Fee Statement

Proposed

Notes

- Field camps may be held immediately prior to the beginning of the regularly scheduled term start date and/or on weekends.
- This course may be offered in a condensed term format.

Existing

Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours) View Program

ENVE 400 - Environmental Engineering Design Project 1

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Description does not align with the course delivery.

Adding a statement about teamwork that are currently integrated within the course and align with CEAB requirements.

Course Information

Faculty

Academic Unit

Faculty of Engineering

Dean of Engineering Office

Subject Code
ENVE

Number
400

Course Level
400

Title
Environmental Engineering Design Project 1

Abbreviated Title
Design Project 1

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Students must undertake a team-based environmental engineering design project during the last two terms of their program. The purpose of the project is to demonstrate students' abilities to practice in an environmental engineering capacity in their chosen area of expertise, using knowledge gained from their academic and employment experiences. Typically, experiential learning opportunities are incorporated to support undergraduate students in developing and advancing their teamwork skills. The first part of the project (ENVE400) will include problem identification, generation and selection of solutions, and project management. Incorporation of technical, ecological, social, political, and economic issues in the solution for the project will be required. Sustainability considerations will be emphasized. Requirements include proposal, progress report, oral presentation, and a final report containing design recommendations for part two of the project, ENVE401.

Existing

Description
Students undertake an independent environmental engineering design project during the last two terms of their plan. The purpose of the project is to demonstrate students' abilities to practise in an environmental engineering capacity in their chosen area of expertise, using knowledge gained from their academic and employment experiences. The first part of the project (ENVE400) will include problem identification, generation and selection of solutions, and time management. Incorporation of technical, ecological, social, political, and economic issues in the solution for the project will be required. A basic requirement of the proposed solution is that it must be compatible with the principles of sustainability. Requirements include proposal, progress report, and a final report containing recommendations for part two of the project (ENVE401).

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureProject

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 4A or higher
- Enrolled in H-Environmental Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option

View Program

Required Courses (Term by Term)

- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours)

View Program

ENVE 401 - Environmental Engineering Design Project 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Minor editorial changes to reflect that this is a team-based project. Added ENVE 400 as a pre-req, as these courses cover a two-term project.

Course Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Subject Code
ENVE

Number
401

Course Level
400

Title
Environmental Engineering Design Project 2

Abbreviated Title
Design Project 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
The course is a continuation of ENVE400. The final design of the major environmental engineering project proposed in ENVE400 will be undertaken. The purpose of this phase of the project is to carry

out a detailed team-based technical design of the solution proposed in ENVE400. Requirements of this part of the two-term project include a symposium presentation and a final report.

Existing

Description
A continuation of ENVE400. The final design of the major environmental engineering project proposed in ENVE400 will be undertaken. The purpose of this phase of the project is to carry out a detailed technical design of the solution proposed in ENVE400. Requirements of this part of the two-term project include a symposium presentation and a final report.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Project

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed the following:**
   - **ENVE400 - Environmental Engineering Design Project 1 (0.50)**
   -
   - Students must be in level 4B or higher
   - Enrolled in H-Environmental Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option

View Program

Required Courses (Term by Term)

- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours)

View Program

GEOE 100 - Environmental and Geological Engineering Concepts

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
2

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

- Being consistent with the faculty level at making courses in 0.25 credits increments.
- This unit weight change should not impact current students as it is a first year course. For students needing to repeat the course, exception or alternative can be worked out with advisor.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code

GEOE

Number

100

Course Level

100

Title

Environmental and Geological Engineering Concepts

Abbreviated Title

Concepts: Env & Geol Eng

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

An introduction to engineering concepts for first-year Environmental and Geological Engineering students including site design, design visualization, and public stakeholder communication. Laboratory sessions expose students to traditional field surveying, modern topographic surveying, engineering graphics, guidelines and regulations, and design visualization. Introduction to the practice and ethics of professional engineering, including licensure and accreditation.

Existing

Description

An introduction to the fundamental methods, principles and skills of environmental and geological engineering. Fundamentals of technical communication, the engineering design process and problem solving. Completion of a pre-design study and report for an environmental engineering project. Independent and team work. Fundamentals of engineering computation units, data collection, measurement, and error analysis. Field surveying (automatic level, engineer's transit, differential global positioning system (GPS), total station). Laboratory on engineering graphics auto-computer assisted diagnosis (Auto CAD) and computational software (Excel, Matlab). Aspects of the engineering profession (code of ethics, negligence, misconduct, role of the Professional Engineers Ontario (PEO), etc.), diversity in the workplace, and professional development. Preparation for the University of Waterloo co-operative education program (Co-operative and Experiential Education, résumé writing, job search, and interview skills).

Proposed
Units 0.75
Existing
Units 0.80

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
Yes,

Cross-Listed Courses

ENVE 100 - Environmental and Geological Engineering Concepts

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add

Consent to Drop

No consent required,

Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1A
- Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) View Program
- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours) View Program

Top

GEOE 400 - Geological Engineering Design Project 1

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Description does not align with the course delivery.

Adding a statement about teamwork that are currently integrated within the course and align with CEAB requirements.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Subject Code
GEOE

Number
400

Course Level
400

Title
Geological Engineering Design Project 1

Abbreviated Title
Design Project 1

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Students must undertake a team-based geological engineering design project during the last two terms of their program. The purpose of the project is to demonstrate students' abilities to practice in a geological engineering capacity in their chosen area of expertise, using knowledge gained from their academic and employment experiences. Typically, experiential learning opportunities are incorporated to support undergraduate students in developing and advancing their teamwork skills. The first part of the project (GEOE400) will include problem identification, generation and selection of solutions, and project management. Incorporation of technical, ecological, social, political, and economic issues in the solution for the project will be required. Sustainability considerations will be emphasized. Requirements include proposal, progress report, oral presentation, and a final report containing design recommendations for part two of the project, GEOE401.

Existing

Description
Students undertake an independent geological engineering design project during the last two terms of their plan. The purpose of the project is to demonstrate students' abilities to practise in a geological engineering capacity in their chosen area of expertise, using knowledge gained from their academic and employment experiences. The first part of the project (GEOE400) will include problem identification, generation and selection of solutions, and time management. Incorporation of technical, ecological, social, political, and economic issues in the solution for the project will be required. A basic requirement of the proposed solution is that it must be compatible with the principles of sustainability. Requirements include proposal, progress report, and a final report containing recommendations for part two of the project (GENE401).

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureProject

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 4A
- Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours)
  View Program

GEOE 401 - Geological Engineering Design Project 2

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Rationale for Change

Minor editorial changes to reflect that this is a team-based project. Added GEOE 400 as a pre-req, as these courses cover a two-term project.

Course Information

Faculty
Faculty of Engineering

Academic Unit
Department of Civil and Environmental Engineering

Subject Code
GEOE

Number
401

Course Level
400

Title
Geological Engineering Design Project 2

Abbreviated Title
Design Project 2

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
The course is a continuation of GEOE400. The final design of the major geological engineering project proposed in GEOE400 will be undertaken. The purpose of this phase of the project is to carry out a detailed team-based technical design of the solution proposed in GEOE400. Requirements of this part of the two-term project include a symposium presentation and a final report.

Existing

Description
A continuation of GEOE400. The final design of the major geological engineering project proposed in GEOE400 will be undertaken. The purpose of this phase of the project is to carry out a detailed technical design of the solution proposed in GEOE400. Requirements of this part of the two-term project include a symposium presentation and a final report.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Project

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed the following:**
   - **GEOE400 - Geological Engineering Design Project 1 (0.50)**
   -
   - Students must be in level 4B
   - Enrolled in H-Geological Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours)
  View Program

MTE 220 - Sensors and Instrumentation

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-11

Rationale for Change

Including the phrase "This course includes individual assessment of technical communication." in the course description. Despite plenty of opportunities to practice various forms of the Communication Skills GA, most are group assessments with limited individual assessments within the curriculum (MTE 100 and now PD 11). The addition of this phrase is paired with course-level changes where students complete an individual technical project and either submit a short technical report or give a short technical presentation, both of which follow the DEAL model of reflection. Thus, a Developing-level individual assessment of the Communication Skills GA is now present in the curriculum.

Consultations

These changes resulted from consultation with various MTE faculty, including Andrew Milne who has accreditation expertise. These changes were approved by the MTE Curriculum Committee, consisting of the ME, ECE, and SYDE Associate Chairs, on September 11, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code

MTE

Number

220

Course Level

200

Title

Sensors and Instrumentation

Abbreviated Title

Sensors & Instrumentation

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

Review of circuit theory; input-output relationships, transfer functions and frequency response of linear systems; operational amplifiers, operational amplifier circuits using negative or positive feedback; diodes, operational amplifier circuits using diodes; analog signal detection, conditioning and conversion systems; transducers and sensors, difference and instrumentation amplifiers, active filters. This course includes individual assessment of technical communication.

Existing

Description

Review of circuit theory; input-output relationships, transfer functions and frequency response of linear systems; operational amplifiers, operational amplifier circuits using negative or positive feedback; diodes, operational amplifier circuits using diodes; analog signal detection, conditioning and conversion systems; transducers and sensors, difference and instrumentation amplifiers, active filters.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

LaboratoryLectureTutorial

Primary Component

Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - MTE120 - Circuits (0.75)
  - MTE201 - Experimental Measurement and Statistical Analysis (0.50)
- Students must be in level 2B or higher
- Enrolled in H-Mechatronics Engineering

Corequisites

Completed or concurrently enrolled in:

- SYDE252 - Linear Systems and Signals (0.50)

Antirequisites

Not completed nor concurrently enrolled in:

- SYDE292 - Circuits, Instrumentation, and Measurements (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- MTE 421 - Introduction to Analog and Digital Transistor-Level Design
- MTE 322 - Electromechanical Machine Design View Program

View Program

Course Requirements (no units)

- Mechatronics Option - Mechatronics Option

View Program

Required Courses (Term by Term)

- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

View Program

MTE 380 - Mechatronics Engineering Design Workshop

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-11

Rationale for Change

Including the phrase "This course includes individual assessment of technical communication." in the course description. Despite plenty of opportunities to practice various forms of the Communication Skills GA, most are group assessments with limited individual assessments within the curriculum (MTE 100 and now PD 11). The addition of this phrase is paired with course-level changes where students complete a group technical project and either submit a short individual addendem to a technical report or give a short technical presentation, both of which follow the DEAL model of reflection. Thus, an Advanced-level individual assessment of the Communication Skills GA is now present in the curriculum.

Consultations

These changes resulted from consultation with various MTE faculty, including Andrew Milne who has accreditation expertise. These changes were approved by the MTE Curriculum Committee, consisting of the ME, ECE, and SYDE Associate Chairs, on September 11, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code

MTE

Number

380

Course Level

300

Title

Mechatronics Engineering Design Workshop

Abbreviated Title

Design Workshop

Undergraduate Communication Requirement Identifier

No,

Proposed

Description

In this course, students study the design process, including needs analysis, problem definition; design criteria and critical parameter identification, generation of alternative solutions; conceptual design, detailed design, optimization; and implementation. Most of the term is devoted to a significant design project in which student groups work independently and competitively, applying the design process to a project goal set by the faculty co-ordinator. The design project typically includes construction of an electro-mechanical prototype, and part of the course grade may depend on the performance of the prototype in a competitive test. In exceptional circumstances, the requirement for a prototype may be replaced by a computer simulation, or may be waived. This course includes individual assessment of technical communication.

Existing

Description

In this course, students study the design process, including needs analysis, problem definition; design criteria and critical parameter identification, generation of alternative solutions; conceptual design, detailed design, optimization; and implementation. Most of the term is devoted to a significant design project in which student groups work independently and competitively, applying the design process to a project goal set by the faculty coordinator. The design project typically includes construction of an electro-mechanical prototype, and part of the course grade may depend on the performance of the prototype in a competitive test. In exceptional circumstances, the requirement for a prototype may be replaced by a computer simulation, or may be waived.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureProject

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 3B or higher
- Enrolled in H-Mechatronics Engineering

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- ME380 - Mechanical Engineering Design Workshop (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- ME 380 - Mechanical Engineering Design Workshop

View Program

Prerequisites

- MTE 482 - Mechatronics Engineering Project
- MTE 481 - Mechatronics Engineering Design Project

View Program

View Program

Required Courses (Term by Term)

- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

View Program

NE 125 - Introduction to Materials Science and Engineering

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-01-15

Rationale for Change

Update the NE 125 Introduction to Materials Science and Engineering course description to reflect the contents being taught in class. The course instructor, NE curriculum committee, and NE executive committee have approved the new version.

Supporting Documentation

- Course Outline - Introduction to Materials Science and Engineering.pdf

Course Information

Faculty

Faculty of Engineering

Academic Unit

Dean of Engineering Office

Subject Code	Number	Course Level
NE	125	100

Title
Introduction to Materials Science and Engineering

Abbreviated Title
Intro Materials Sci & Eng

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Fundamentals of crystalline structure, crystal defects, and noncrystallinity. Mechanical, magnetic, diffusion, and thermal properties of materials, such as metals, ceramics, and polymers. Topics include, but are not limited to, elastic and plastic deformations, fracture mechanics, magnetic dipoles and magnetization, Fick's laws, and Fourier's Law. Application of phase diagrams and transformation in engineering materials. Processing and concepts of engineering design of materials.

Existing

Description
Fundamentals of crystalline structure, crystal defects, and noncrystallinity. Structure and properties of metals, ceramics, glasses, amorphous materials, polymers, and composites. Processing and concepts of engineering design of materials.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - NE121 - Chemical Principles (0.50)
- Students must be in level 1B or higher
- Enrolled in H-Nanotechnology Engineering

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- CHE241 - Materials Science and Engineering (0.50)
- CIVE265 - Structure and Properties of Materials (0.50)
- ME235 - Materials Science and Engineering (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- NE 220L - Materials Science and Engineering Laboratory
- NE 343 - Microfabrication and Thin-Film Technology

View Program

View Program

Required Courses (Term by Term)

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)

View Program

SYDE 322 - Software Design

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type

Academic Unit Approval

Change, 2024-10-10

Rationale for Change

The course topic is software engineering and is essentially the same course as MSE 342.

Consultations

Ada Hurst, Associate Chair Undergraduate Studies - MSE, confirmed.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Subject Code
SYDE

Number
322

Course Level
300

Title
Software Design

Abbreviated Title
Software Design

Undergraduate Communication Requirement Identifier
No,

Description
Software requirements specification; software architecture; design patterns; software testing and quality assurance; software maintenance; design of efficient algorithms and methods for their analysis, mathematical algorithms, string processing algorithms, geometrical algorithms, exhaustive search and traversal techniques, introduction to lower bound theory and NP-completeness. Case studies and engineering examples.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureOnline

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed at least 1 of the following:
  - BME122 - Data Structures and Algorithms (0.50)
  - CS240 - Data Structures and Data Management (0.50)
  - CS240E - Data Structures and Data Management (Enriched) (0.50)

- ECE250 - Algorithms and Data Structures (0.50)
- MTE140 - Algorithms and Data Structures (0.50)
- SYDE223 - Data Structures and Algorithms (0.50)

- Complete 1 of the following
  - Complete all of the following
    - Students must be in level 3A or higher
    - Enrolled in H-Biomedical Engineering
  - Complete all of the following
    - Students must be in level 3B or higher
    - Enrolled in H-Systems Design Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **MSE342 - Principles of Software Engineering (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- CS 246E - Object-Oriented Software Development (Enriched) View Program
- CS 246 - Object-Oriented Software Development View Program
- CS 247 - Software Engineering Principles View Program

Prerequisites

- SE 463 - Software Project Management, Requirements, and Analysis View Program
- MSE 436 - Decision Support Systems View Program
- STAT 340 - Stochastic Simulation Methods View Program

Course Requirements (no units)

- Intelligent & Automated Systems Specialization - Intelligent and Automated Systems Specialization View Program

Course Lists

- H-Biomedical Engineering - Biomedical Engineering (Bachelor of Applied Science - Honours) View Program
- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours) View Program
- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours) View Program
- H-Systems Design Engineering - Systems Design Engineering (Bachelor of Applied Science - Honours) View Program

SYDE 543 - Cognitive Ergonomics

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-10-10

Rationale for Change

SYDE543 and AVIA310 cover the same basic material in human factors. The only difference is that AVIA solely focuses on the application of aviation.

Note: AVIA310 is being renumbered AVIA210, both should be antireqs.

Consultations

Shi Cao, a faculty in Systems Design, who is also affiliated with AVIA confirmed the request as valid.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Subject Code

SYDE

Number

543

Course Level

500

Title

Cognitive Ergonomics

Abbreviated Title

Cognitive Ergonomics

Undergraduate Communication Requirement Identifier

No,

Description

This course focuses on the role engineering psychology research plays in design of the information displays and devices associated with simple and complex cognitive tasks. Main topics include signal detection and target location tasks, navigation tasks, training tasks, communication tasks, human error, stress and mental workload, supervisory control, and situational awareness.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

LectureTutorial

Primary Component

Lecture

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete 1 of the following

- Enrolled in Biomechanics Option, H-Biomedical Engineering, Ergonomics & Injury Prevention Minor, or H-Systems Design Engineering
- Complete all of the following
  - Students must be in level 4A or higher
  - Enrolled in H-Mechatronics Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AVIA310 - Human Factors in Aviation (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Prerequisites

- SYDE 542 - Interface Design

View Program

Course Requirements (no units)

- Human Factors & Interfaces Specialization - Human Factors and Interfaces Specialization

View Program

Course Lists

- Computing Option - Computing Option
- Computer Engineering Option - Computer Engineering Option
- Software Engineering Option - Software Engineering Option
- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

View Program

View Program

View Program

View Program

Course Requirements (no units)

- Cognitive Science Minor - Cognitive Science Minor
- Biomechanics Option - Biomechanics Option

View Program

View Program

Course Lists

- H-Biomedical Engineering - Biomedical Engineering (Bachelor of Applied Science - Honours)
- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)
- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)
- H-Systems Design Engineering - Systems Design Engineering (Bachelor of Applied Science - Honours)
- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours)

View Program

View Program

View Program

View Program

Course Requirements (units)

- Ergonomics & Injury Prevention Minor - Ergonomics and Injury Prevention Minor

View Program

Top

Chemical Process Modelling, Optimization & Control Specialization - Chemical Process Modelling, Optimization and Control Specialization

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-15

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Not Applicable,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

CHE523 is a new technical elective relevant to the Process Modelling, Optimization & Control Specialization.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Specialization

Program/Plan Name
Chemical Process Modelling, Optimization and Control Specialization

Admissions

Specialization is available for students in the following majors

H-Chemical Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Graduation Requirements

- Complete a total of four courses according to the requirements below.

Course Requirements (units)

Required Courses

- oUnits to Complete
- No Rules

1. Required Courses
    -
    - Complete 4 of the following:
    - CHE499 - Elective Research Project (0.50)
    - CHE500 - Special Topics in Chemical Engineering (0.50)
    - CHE520 - Process Modelling and Simulation (0.50)
    - CHE521 - Process Optimization (0.50)
    - CHE522 - Advanced Process Dynamics and Control (0.50)
    - **Course Not Found**
    - CHE524 - Process Control Laboratory (0.50)
    - CHE565 - Synthetic Biology Project Design (0.50)
    - EARTH456 - Numerical Methods in Hydrogeology (0.50)
    - ME362 - Fluid Mechanics 2 (0.50)
    - ME559 - Finite Element Methods (0.50)
    - ME566 - Computational Fluid Dynamics for Engineering Design (0.50)
    - MSE332 - Deterministic Optimization Models and Methods (0.50)
    - MSE431 - Stochastic Models and Methods (0.50)
    - MSE432 - Production and Service Operations Management (0.50)
    - MSE551 - Quality Management and Control (0.50)
    - NE451 - Simulation Methods (0.50)
    - SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

Some cross-listings not to be counted,

Removing Cross-Lists

BIOL349 (CL with CHE565) removed at Feb 2024 SUC

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Energy & Climate Change Specialization - Energy and Climate Change Specialization

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-18

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

For the 2025 cohort we “reimagined” our current specializations.

Continued discussions within the ENVE curriculum committee, with our students, and with other departments across the list have shown that the lists contain some errors and that there are other courses that would benefit our students.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Specialization

Program/Plan Name
Energy and Climate Change Specialization

Admissions

Specialization is available for students in the following majors

H-Environmental Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Graduation Requirements

- Complete a minimum of five courses totaling 2.5 units or greater according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete a minimum of five courses totaling 2.5 units or greater according to the requirements below.
    -
    - List 1
    -
    - Complete 2 of the following:
    - AE572 - Building Energy Analysis (0.50)
    - AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
    - AE585 - Air Quality Engineering and Impacts (0.50)
    - CIVE507 - Building Science and Technology (0.50)
    - ENVE585 - Air Quality Engineering and Impacts (0.50)
    - ME572 - Building Energy Analysis (0.50)
    - ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
    -
    - List 2
    -
    - Complete all of the following
    - The remaining 3 courses can be from List 1 or 2.
    - Choose any of the following:
    - **CHE516 - Energy Systems Engineering (0.50)**
    - CHE571 - Industrial Ecology (0.50)
    - CHE572 - Air Pollution Control (0.50)
    - **ERS202 - Natural Resources Ecology (0.50)**
    - GEOG207 - Climate Change Fundamentals (0.50)
    - GEOG304 - Carbon in the Biosphere (0.50)
    - GEOG408 - Earth's Future Climates (0.50)
    - GEOG409 - Energy Balance Climatology (0.50)
    - ME354 - Thermodynamics 2 (0.50)
    - ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
    - ME459 - Energy Conversion (0.50)

- ME571 - Clean Air Technologies (0.50)
- ~~CHE514 - Fundamentals of Petroleum Production (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Special topics courses ENVE495 and ENVE497 may be eligible to count towards the specialization requirements depending on the course topic, and with approval from the Civil and Environmental Engineering Associate Chair, Undergraduate Studies.

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

ENVE-Water Resources Specialization - Water Resources Specialization

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-18

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

For the 2025 cohort we “reimagined” our current specializations.

Continued discussions within the ENVE curriculum committee, with our students, and with other departments across the list have shown that the lists contain some errors and that there are other courses that would benefit our students.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty

Faculty of Engineering

Undergraduate Credential Type

Specialization

Program/Plan Name

Water Resources Specialization

Admissions

Specialization is available for students in the following majors

H-Environmental Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Graduation Requirements

- Complete a minimum of five courses totaling 2.5 units or greater according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete a minimum of five courses totaling 2.5 units or greater according to the requirements below
    -
    - List 1
    -
    - Complete 2 of the following:
    - CIVE583 - Design of Urban Water Systems (0.50)
    - ENVE383 - Hydrologic Modelling (0.50)
    - ENVE481 - Open Channel Hydraulics (0.50)
    - ENVE583 - Design of Urban Water Systems (0.50)
    -
    - List 2
    -
    - Complete all of the following
    - **Complete 3 courses from any additional List 1 courses or from the list of courses below.**
    - Choose any of the following:
    - BIOL462 - Applied Wetland Science (0.50)
    - **EARTH355 - Water: Data to Decisions (0.50)**
    - EARTH444 - Applied Wetland Science (0.50)
    - **EARTH439 - Flow and Transport Through Fractured Rocks (0.50)**
    - EARTH458 - Physical Hydrogeology (0.50)
    - EARTH458L - Field Methods in Hydrogeology (0.25)
    - ENVE573 - Contaminant Transport (0.50)
    - GEOG305 - Fluvial Geomorphology (0.50)
    - GEOG371 - Advanced Remote Sensing Techniques (0.50)
    - GEOG381 - Advanced Geographic Information Systems (0.50)
    - GEOG453 - Urban Stormwater Management (0.50)
    - PLAN381 - Advanced Geographic Information Systems (0.50)
    - PLAN453 - Urban Stormwater Management (0.50)
    - SYDE532 - Introduction to Complex Systems (0.50)
    - SYDE533 - Conflict Resolution (0.50)
    - ~~The remaining 3 courses can be from List 1 or 2.~~
    - ~~EARTH459 - Chemical Hydrogeology (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Special topics courses ENVE495 and ENVE497 may be eligible to count towards the specialization requirements depending on the course topic, and with approval from the Civil and Environmental Engineering Associate Chair, Undergraduate Studies.

2. EARTH458 and EARTH458L must be taken together and count as one course towards the specialization requirements.

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Dependencies

Society, Technology & Values Diploma - Diploma in Society, Technology and Values

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Not Applicable,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

- Adding ARBUS 202: it is cross-listed with PHIL 215, which is already on the B list.
- Adding GBDA 203 as a good fit for List C.
- Adding STV 201 and STV 401 to Lists B & C, a student can use this course once.
- Added STV 212, new course, to List A.

General Program/Plan Information

Faculty
Faculty of Engineering

Academic Unit
Dean of Engineering Office

Faculty
Faculty of Engineering

Undergraduate Credential Type

Diploma

Program/Plan Name
Diploma in Society, Technology and Values

Admissions

Admissions Entry Point
Both,

Declaration Audience
This credential is open to students enrolled in any degree program. This credential is open to students enrolled in degree programs or any non- or post-degree academic plan.

Requirements Information

Invalid Combinations

No,

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum cumulative diploma average of 70.0%.

Graduation Requirements

- Complete a total of 2.0 units.

1. Required Courses
    - 2Units to Complete
    -
    - Complete all of the following
    - Complete 2 of the following:
    - HIST212 - The Computing Society (0.50)
    - STV100 - Society, Technology and Values: Introduction (0.50)
    - STV202 - Design and Society (0.50)
    - STV205 - Cybernetics and Society (0.50)
    - STV208 - Artificial Intelligence and Society: Impact, Ethics, and Equity (0.50)
    - STV210 - The Computing Society (0.50)
    - **Course Not Found**
    -
    - Complete 1 of the following:
    - **ARBUS202 - Professional and Business Ethics (0.50)**
    - BME381 - Biomedical Engineering Ethics (0.50)
    - CIVE491 - Engineering Law and Ethics (0.50)
    - ENGL320 - History and Theory of Pre-Internet Media (0.50)
    - ENVE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
    - ENVS105 - Environmental Sustainability and Ethics (0.50)
    - GEOE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
    - GBDA306 - Ethics and Values in Design (0.50)
    - PHIL215 - Professional and Business Ethics (0.50)
    - PHIL224 - Environmental Ethics (0.50)
    - PHIL226 - Biomedical Ethics (0.50)
    - PHIL228 - Ethics and Artificial Intelligence (0.50)
    - PHIL259 - Philosophy of Technology (0.50)
    - PHIL315 - Ethics and the Engineering Profession (0.50)
    - SOC232 - Technology and Social Change (0.50)
    - **STV201 - Society, Technology and Values: Special Topics (0.50)**
    - STV302 - Information Technology and Society (0.50)
    - STV304 - Technology in Canadian Society (0.50)
    - STV305 - Technology, Society and the Modern City (0.50)
    - STV306 - Biotechnology and Society (0.50)
    - **STV401 - Society, Technology and Values: Advanced Topics (0.50)**
    -
    - Complete 1 of the following:
    - AE101 - History of the Built Environment (0.50)

- ANTH106 - Technologies of Being Human (0.50)
- ANTH303 - Anthropology of Digital Media (0.50)
- ARCH142 - Introduction to Cultural History (0.50)
- CS492 - The Social Implications of Computing (0.50)
- ECE458 - Computer Security (0.50)
- ENGL108D - Digital Lives (0.50)
- ENGL208B - Science Fiction (0.50)
- ENGL294 - Introduction to Critical Game Studies (0.50)
- ENGL295 - Social Media (0.50)
- ERS215 - Environmental and Sustainability Assessment 1 (0.50)
- ERS270 - Introduction to Sustainable Agroecosystems (0.50)
- ERS294 - Spirituality, Religion, and Ecology (0.50)
- ERS372 - First Nations and the Environment (0.50)
- **GBDA203 - Introduction to Digital Culture (0.50)**
- GBDA303 - Data and Society (0.50)
- HIST203 - Methods of Public History (0.50)
- HIST216 - From Gutenberg to Zuckerberg: A (Long) History of the Internet (0.50)
- INDEV262 - Introduction to Global Emerging Cities (0.50)
- INTEG121 - Collaboration, Design Thinking, and Problem Solving (0.50)
- LS213 - Surveillance Studies (0.50)
- LS329 - Security and Governance (0.50)
- MSE442 - Impact of Information Systems on Organizations and Society (0.50)
- NE109 - Societal and Environmental Impacts of Nanotechnology (0.50)
- PACS201 - Roots of Conflict, Violence, and Peace (0.50)
- PACS315 - Engineering and Peace (0.50)
- RCS285 - Spirituality, Religion, and Ecology (0.50)
- SCI200 - Energy - Its Development, Use, and Issues (0.50)
- SCI252 - Quantum Mechanics for Everyone (0.50)
- SCI267 - Introduction to the Philosophy of Science (0.50)
- SOC213 - Surveillance Studies (0.50)
- SOC329 - Security and Governance (0.50)
- **STV201 - Society, Technology and Values: Special Topics (0.50)**
- **STV401 - Society, Technology and Values: Advanced Topics (0.50)**
- SYDE261 - Design, Systems, and Society (0.50)
-
- Grand Total Units: 2

1. Required Courses
   -
   - No Rules

1. Required Courses
   -
   - No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. No one course may fulfil more than one requirement within the Diploma.

Notes

1. Exceptions to the requirements and electives listed above require prior approval from the Centre for Society, Technology and Values Director.

Specializations

Undergraduate Plan Guidelines

Adherence to Academic Plan Guidelines

Yes,

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Engineering

Senate Workflow
Senate Regular,

Dependencies

Date 2025/12/01

Show Empty Fields

Meeting Information

Agenda Page TitleSUC - 2025-12 - Consent Agenda - Faculty of Mathematics

Career Level
Undergraduate,

Faculty/UnitMathematics

Date2025-12-09 **Time** **Location**

Summary

1. Course Retires, New Courses, and Course Changes.

Course Retires:

No proposals.

New Courses:

- **ACTSC456 - *Statistical Learning in Actuarial Science***
- **ACTSC457 - *Predictive Modelling in Property and Casualty Insurance***
- **AMATH462 - *Introduction to Mathematics of Climate Modelling***
- **AMATH490 - *Topics in Applied Mathematics***

- **CO365 - *Optimization Models and Algorithms for Data Science***
- **PMATH490 - *Honours Thesis***

Course Changes:

- **ACTSC431 - updated prerequisite requirements.**
- **AMATH242 (cross-listed w. CS371) - addition of Test Slot component.**
- **AMATH361 - updated course description and prerequisites, no proposed changes to content.**
- **AMATH451 - addition of Tutorial component.**
- **AMATH463 - updated course description and prerequisites, no proposed changes to content.**
- **AMATH499 - proposal to allow course to be repeated for credit.**
- **CO442 - updated course description, no proposed changes to content.**
- **CS371 (cross-listed w. AMATH242) - addition of Test Slot component.**
- **CS431 - updated prerequisite requirements.**
- **CS459 - updated corequisite requirements.**

2. Minor Plan Modifications

- **H-Applied Mathematics - updated list of eligible 400-level courses.**
- **JH-Applied Mathematics - updated list of eligible 400-level courses.**
- **H-Applied Mathematics with Scientific Computing and Scientific Machine Learning - additional courses added to List 1.**
- **Climate & Sustainability Specialization - addition of newly created course (AMATH462 - *Introduction to Mathematics of Climate Modelling*).**
- **Combinatorics and Optimization Minor - removal of MATH103 as an option in required courses.**
- **CS-Bioinformatics Specialization - updated graduation requirements, eliminating exemption from breadth and depth requirements.**
- **H-Actuarial Science - required courses updated to reflect the increasing importance of statistical learning in the actuarial profession.**
- **ACTSC-Finance Specialization - removal of AFM102 from required courses.**
- **ACTSC-Predictive Analytics Specialization - required courses updated.**

Other Business

Course Proposals

Courses: Retire No proposals have been added.

Courses: New

Code	Title	Type	Workflow Step
ACTSC 456	Statistical Learning in Actuarial Science	Courses	SUC Subcommittee, SUC Curricular Subcommittee
ACTSC 457	Predictive Modelling in Property and Casualty Insurance	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AMATH 462	Introduction to Mathematics of Climate Modelling	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AMATH 490	Topics in Applied Mathematics	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CO 365	Optimization Models and Algorithms for Data Science	Courses	SUC Subcommittee, SUC Curricular Subcommittee
PMATH 490	Honours Thesis	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Courses: Changes

Code	Title	Type	Workflow Step
ACTSC 431	Casualty and Health Insurance Mathematics 2	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AMATH 242	Introduction to Computational Mathematics	Courses	SUC Subcommittee, SUC Curricular Subcommittee

AMATH 361	Continuum Mechanics	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AMATH 451	Introduction to Dynamical Systems	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AMATH 463	Fluid Mechanics	Courses	SUC Subcommittee, SUC Curricular Subcommittee
AMATH 499	Research Project	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CO 442	Graph Theory	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CS 371	Introduction to Computational Mathematics	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CS 431	Data-Intensive Distributed Analytics	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CS 459	Privacy, Cryptography, Network and Data Security	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Programs & Plans Proposals

Programs & Plans: Retire No proposals have been added.

Programs & Plans: Major Modifications No proposals have been added.

Programs & Plans: Minor Modifications

Code	Title	Type	Workflow Step

H-Applied Mathematics	Applied Mathematics (Bachelor of Mathematics - Honours)	Programs	SUC Subcommittee, SUC Curricular Subcommittee
JH-Applied Mathematics	Applied Mathematics (Joint Honours)	Programs	SUC Subcommittee, SUC Curricular Subcommittee
H-Applied Mathematics with Scientific Computing & Scientific Machine Learning	Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)	Programs	SUC Subcommittee, SUC Curricular Subcommittee
Climate & Sustainability Specialization	Climate and Sustainability Specialization	Programs	SUC Subcommittee, SUC Curricular Subcommittee
Combinatorics & Optimization Minor	Combinatorics and Optimization Minor	Programs	SUC Subcommittee, SUC Curricular Subcommittee
CS-Bioinformatics Specialization	Bioinformatics Specialization	Programs	SUC Subcommittee, SUC Curricular Subcommittee
H-Actuarial Science	Actuarial Science (Bachelor of Mathematics - Honours)	Programs	SUC Subcommittee, SUC Curricular Subcommittee
ACTSC-Finance Specialization	Finance Specialization	Programs	SUC Subcommittee, SUC Curricular Subcommittee
ACTSC-Predictive	Predictive Analytics	Programs	SUC Subcommittee,

Analytics Specialization	Specialization		SUC Curricular Subcommittee

Regulations Proposals

Regulations: Retire No proposals have been added.

Regulations: New No proposals have been added.

Regulations: Changes No proposals have been added.

ACTSC 456 - Statistical Learning in Actuarial Science

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-06-27

Rationale for New Course

By creating this new course, the objective is to expose our ACTSC majors to a wide variety of statistical learning models used in actuarial and financial applications. The scope of applications of these statistical models has grown in recent years in the field of Actuarial Science and various actuarial professional organizations now include a wider range of statistical learning knowledge in their qualification curriculum. The new course will provide comprehensive coverage of predictive analytics topics specified under the Canadian Institute of Actuaries' University Accreditation Program, therefore providing a more efficient pathway for students to obtain the accreditation.

Please see supporting documentation "Schedule Plan - ACTSC456.PDF" for a weekly breakdown.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

No consultations were necessary.

Supporting Documentation

- Schedule plan - ACTSC 456.pdf

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Statistics and Actuarial Science

Subject Code
ACTSC

Number
456

Course Level
400

Title
Statistical Learning in Actuarial Science

Abbreviated Title
Statistical Learning

Undergraduate Communication Requirement Identifier
No,

Description
This course explores a broad range of statistical learning models used to analyze data in actuarial and financial contexts. It covers techniques from both supervised and unsupervised learning, with a focus on practical applications. Specific topics covered include modelling principles and practice, advanced and regularized regression models, cross-validation, traditional classification models (logistic regression, LDA, QDA, KNN), decision trees (bagging, boosting, random forests), dimensionality reduction (PCA), hierarchical and K-means clustering, and an introduction to neural networks with applications to supervised and unsupervised learning problems. Some extensions to the above models may also be considered.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed at least 1 of the following:
  - STAT331 - Applied Linear Models (0.50)
  - STAT371 - Applied Linear Models and Process Improvement for Business (0.50)
  - STAT373 - Regression and Forecasting Methods in Finance (0.50)
- Enrolled in H-Actuarial Science, JH-Actuarial Science, or H-Mathematical Finance

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- STAT441 - Statistical Learning - Classification (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

There are no dependencies

Top

ACTSC 457 - Predictive Modelling in Property and Casualty Insurance

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-06-27

Rationale for New Course

Property and Casualty insurance is one of the core practice areas in actuarial science. Since 2017, this course has been offered annually as an undergraduate ACTSC topics course. It has consistently attracted strong interest and received positive feedback from students. The predictive analytics techniques emphasized in the course have also become a central topic in the broader insurance industry. Relabelling this course as a stand-alone course will help students plan their degree programs more predictably, make the course title visible on their transcripts, and free up space for other potential topics in actuarial science.

Please see supporting documentation "Schedule Plan - ACTSC457.PDF" for a weekly breakdown.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

No consultations were necessary.

Supporting Documentation

- Schedule plan - ACTSC 457.pdf

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Statistics and Actuarial Science

Subject Code

ACTSC

Number

457

Course Level

400

Title

Predictive Modelling in Property and Casualty Insurance

Abbreviated Title

Predictive Model in P&C Ins

Undergraduate Communication Requirement Identifier

No,

Description

This course introduces the fundamentals of predictive modelling with a focus on applications in loss modelling and pricing in the property and casualty insurance industry. The course centres on a case study approach to develop comprehensive pricing models using realistic, large-scale insurance data. The course also emphasizes practical skills in data cleansing, exploratory analysis, model development and validation.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?

No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - ACTSC363 - Casualty and Health Insurance Mathematics 1 (0.50)
  - STAT331 - Applied Linear Models (0.50)
- Enrolled in H-Actuarial Science, JH-Actuarial Science, or H-Mathematical Finance

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in: ACTSC489 (Topic 1: Predictive Modelling in P&C)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Mathematics

Dependencies

There are no dependencies

AMATH 462 - Introduction to Mathematics of Climate Modelling

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-06-19

Rationale for New Course

Currently, in the new Climate and Sustainability specialization, there are no AMATH elective courses (all are either GEOG or PLAN). This course will offer a more quantitative, specifically applied mathematics elective to the new specialization. It also offers to be a practical application elective course in fluid dynamics and climate science for students in Physics and Geography and Environment students.

Relationship with existing courses:

- AMATH 362 (Mathematics of Climate Change): while AMATH 362 focuses more the physics of climate itself (e.g., radiative balance, climate feedbacks), this new course will instead focus on how climate is studied through understanding of more advanced techniques for the analysis of climate data and of the mathematical basics of equations solved by climate models. Therefore, the two courses are complementary, but are not anti-requisites to each other and can be taken in any sequence.
- GEOG 408 (Earth's Future Climates): GEOG 408 is a more descriptive course that focuses on qualitative differences across climate models and implications of these differences and is focused on working with climate model outputs. The new course will be significantly more quantitative, looking under the hood at the mathematical formulations of climate models that can be used to explain the differences across the models. Therefore, these two courses are also complementary, and the new course can attract students interested in more quantitative and computational components.

- AMATH 361 (Continuum Mechanics) and AMATH 463 (Fluid Mechanics): the new course will use the (geophysical) fluid dynamics equations and conservation principles that are covered in AMATH 361 and AMATH 463 to climate models. The courses can be taken in either progression: (1) AMATH 361/463 followed by the new course to first learn the governing equations and physical principles then apply them or (2) new course as brief introduction to the governing equations and applications in climate science followed by AMATH 361/463 to study the differential equations and fluid dynamics in depth.

Week-by-week topics

-
  - Week 1: Fourier analysis of climate data timeseries to assess relevant time scales (weather vs climate)
  - Week 2: analysis of climate patterns through wavelet analysis
  - Week 3: linear and nonlinear regression models
  - Week 4: case study examining the learned data analysis methods (Fourier/wavelet, regression)
  - Week 5: Conservation principles in fluid dynamics

- Week 6: Governing geophysical fluid dynamics equations in climate models
- Week 7: Coupling between climate model components (land, ocean, atmosphere, cryosphere); boundary conditions as sources of model uncertainty
- Week 8: Sources of model uncertainty: parametrizations of small-scale processes
- Week 9: Sources of model uncertainty: sensitivity to initial conditions and tipping points; case study
- Week 10: Uncertainty quantification (Bayesian statistics, Monte Carlo methods)
- Week 11: Development of ensembles of future carbon forcing pathways
- Week 12: Sources of model uncertainty: sensitivity to model forcing (carbon pathway); case study (future mitigation, adaptation costs)

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

Barbara Zemskova (the original proposer of the course) has consulted with Chris Fletcher, chair of Geography and Environmental Management, about this course. Geography has expressed interest for the computationally-oriented content for their own undergraduate students (though most would not meet the prerequisite), and is supportive of additional electives being made available on campus for students interested in climate modelling. The proposed timing of the course has been agreed as the fall term to coordinate with other GEOG courses offered in the winter term.

Geography and Environmental Management has also indicated that the course, if held with a graduate special topics course, could serve as a quantitative and computationally oriented elective for the Master's of Climate Change.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Subject Code

AMATH

Number

462

Course Level

400

Title

Introduction to Mathematics of Climate Modelling

Abbreviated Title

Intro Math Climate Modelling

Undergraduate Communication Requirement Identifier

No,

Description

This course will introduce mathematical techniques, including analytical, computational, and machine learning methods, used to study climate change. Course material will examine both historical evidence of climate change and future predictions related to climatological and societal impacts based on current climate models. The course will have a strong computational component to study the governing geophysical fluid dynamics equations in climate models and their properties. The course will also examine the application of learned principles to climate modelling through in-depth discussions of journal readings.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Lecture

Primary Component

Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Must have completed at least 1 of the following:

- MATH118 - Calculus 2 for Engineering (0.50)
- MATH119 - Calculus 2 for Engineering (0.50)

- MATH128 - Calculus 2 for the Sciences (0.50)
- MATH138 - Calculus 2 for Honours Mathematics (0.50)
- MATH148 - Calculus 2 (Advanced Level) (0.50)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

There are no dependencies

AMATH 490 - Topics in Applied Mathematics

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-03-31

Rationale for New Course

Currently “AMATH 495 - Reading course” has been used as both a reading course (typically 1 or 2 students, no formal lectures) and a topics course (lecture course for a substantial number of students). This is causing confusion. The creation of the new course “AMATH 490 - Topics in Applied Mathematics” would lift the confusion; AMATH 495 would become solely a reading course.

Approved at UAC 20250929.

Approved at FC 20251028.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Subject Code

AMATH

Number

490

Course Level

400

Title

Topics in Applied Mathematics

Abbreviated Title

Topics in Applied Mathematics

Undergraduate Communication Requirement Identifier

No,

Description

Topics course in an emerging or specialized area of applied mathematics. Consult the schedule of classes for specific topics being offered.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Lecture

Primary Component

Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
Yes,

Total Completions Allowed
10

Allow Multiple Enrol in a Term
Yes,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Students must be in level 3A

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Notes

-

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

There are no dependencies

CO 365 - Optimization Models and Algorithms for Data Science

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Rationale for New Course

CO365, Optimization and Models and Algorithms for Data Science, addresses the growing use of optimization to solve problems in data science and machine learning. The computational heart of data science, given a data set, is constructing a model that explains how the data was generated. This problem almost always involves finding optimal parameters of the model. The department already offers a graduate course CO673 in the area of optimization for data science, and this course attracts approximately 90 grad students in each offering. Undergraduates often inquire about taking this grad course, but they are usually turned away due to enrolment caps. Therefore, we expect a high demand for a course in this area at the undergraduate level, especially in light of the forthcoming creation of a minor and new major in Data Science.

Course Breakdown:

Review of linear algebra; convex sets and functions.	1 week
Example - least squares, regression, and ridge regression.	1 week
Basics of optimization.	1.5 weeks
Gradient descent and line search.	1.5 weeks
Application of gradient descent in data science (e.g. Huber regression).	1 week
Stochastic gradient descent.	1 week
Application of stochastic gradient descent in data science (e.g. binary classification).	1 week
Clustering and k-means algorithm	1 week
Extensions of clustering (e.g. fair clustering, correlation clustering).	1 week
Decision trees and mixed integer optimization for optimal decision trees.	1 week
Random decision trees.	1 week

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

Verified with CO Associate Chair (Steve Melczer): removed the superfluous CS115/135/145 prerequisite requirement as per SUC feedback.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Combinatorics and Optimization

Subject Code

CO

Number

365

Course Level

300

Title

Optimization Models and Algorithms for Data Science

Abbreviated Title

Optimization for Data Science

Undergraduate Communication Requirement Identifier

No,

Description

Modelling problems in data science and machine learning as optimization problems, and their analysis. Solution methods, including gradient descent and its extensions, and their consequences in modelling decisions. Convexity and Lagrangian duality. Applications to clustering and classification problems. Analysis and implementation of computational methods.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed at least 1 of the following:
  - CS116 - Introduction to Computer Science 2 (0.50)
  - CS136 - Elementary Algorithm Design and Data Abstraction (0.50)
  - CS146 - Elementary Algorithm Design and Data Abstraction (Advanced Level) (0.50)
- Must have completed at least 1 of the following:
  - CO250 - Introduction to Optimization (0.50)
  - CO255 - Introduction to Optimization (Advanced Level) (0.50)
- Complete 1 of the following
  - Must have completed at least 1 of the following:
    - MATH138 - Calculus 2 for Honours Mathematics (0.50)
    - MATH148 - Calculus 2 (Advanced Level) (0.50)
  - Earned a minimum grade of 70% in each of the following:
    - MATH128 - Calculus 2 for the Sciences (0.50)
- Must have completed at least 1 of the following:
  - MATH235 - Linear Algebra 2 for Honours Mathematics (0.50)
  - MATH245 - Linear Algebra 2 (Advanced Level) (0.50)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Mathematics

Dependencies

There are no dependencies

PMATH 490 - Honours Thesis

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-04-29

Rationale for New Course

The purpose of PMATH 490 is to provide exceptional students with the opportunity to engage in research under the supervision of a professor and to produce a thesis summarizing results. The Department does not currently have a course which would allow a student to create such a document/project for course credit. This course also provides more structure than a reading course and the title "honours thesis" would be more recognizable to other institutions (grad schools etc.).

The attached documents are included to demonstrate how the course will be administered. They are not being voted on and are subject to change as we run the course.

Approved at UAC 20250526.

Approved at FC 20251028.

Consultations

No consultations necessary.

Supporting Documentation

- PMATH490 Agreement Form.pdf
- PMATH490 Completion Form.pdf
- PMATH490_Proposal.pdf

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Pure Mathematics

Subject Code

PMATH

Number

490

Course Level

400

Title

Honours Thesis

Abbreviated Title

Honours Thesis

Undergraduate Communication Requirement Identifier

No,

Description

A research-based course that allows students with an interest in pure mathematics to participate in a research project with a faculty member. The student is required to approach a faculty member of the Department of Pure Mathematics for supervision. A form containing a detailed thesis proposal and name of a supervisor are required and must be approved by the Pure Mathematics advisor.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

Project

Primary Component

Project

Grading Information

Standard Course Grading
No,

Special Course Grading
Credit/No Credit

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
Department consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Students must be in level 4A or higher

- Enrolled in H-Pure Mathematics, or JH-Pure Mathematics

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

There are no dependencies

Top

ACTSC 431 - Casualty and Health Insurance Mathematics 2

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-27

Rationale for Change

ACTSC minor requires to complete one 400-level ACTSC course. Our practice is for advisors to consult with students and manually enroll them in one of the 400-level ACTSC courses that fits best with their interests.

Currently, ACTSC 431 is the only 400-level ACTSC course still open to ACTSC

minor students. Removing it as an eligible program on the calendar will help avoid confusion, as students may incorrectly assume that ACTSC 431 is the only course available to them, and better align with our advising practices.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

No consultations were necessary.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Statistics and Actuarial Science

Subject Code

ACTSC

Number

431

Course Level

400

Title

Casualty and Health Insurance Mathematics 2

Abbreviated Title
Casualty & Hlth Insur Math 2

Undergraduate Communication Requirement Identifier
No,

Description
Aggregate loss and payment models: properties, analytic results, convolution-type methods, recursive methods, inversion-type methods, and simulation; advanced aggregate claims models; reinsurance; applications to insurance pricing; insurance pricing using generalized linear models.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed the following:
   - STAT330 - Mathematical Statistics (0.50)
   -
   - Must have completed at least 1 of the following:
   - STAT331 - Applied Linear Models (0.50)
   - STAT371 - Applied Linear Models and Process Improvement for Business (0.50)
   - STAT373 - Regression and Forecasting Methods in Finance (0.50)
   -
   - Earned a minimum grade of 60% in each of the following:
   - ACTSC363 - Casualty and Health Insurance Mathematics 1 (0.50)
   -
   - **Enrolled in H-Actuarial Science, JH-Actuarial Science, or H-Mathematical Finance**
   - ~~Enrolled in JH-Actuarial Science, H-Actuarial Science, Actuarial Science Minor, or H-Mathematical Finance~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (no units)

- H-Actuarial Science - Actuarial Science (Bachelor of Mathematics - Honours) View Program
- JH-Actuarial Science - Actuarial Science (Joint Honours) View Program

AMATH 242 - Introduction to Computational Mathematics

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-18

Rationale for Change

We are adding a test component to align the course with he proposed CS change for the cross listed code CS371 and consolidate the calendar with how the course has been taught in the past (which included a scheduled midterm test).

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

This change was made from a request from CS to add a test component to the course.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Subject Code

AMATH

Number

242

Course Level

200

Title

Introduction to Computational Mathematics

Abbreviated Title

Intro Computational Math

Undergraduate Communication Requirement Identifier

No,

Description

A rigorous introduction to the field of computational mathematics. The focus is on the interplay between continuous models and their solution via discrete processes. Topics include pitfalls in computation, solution of linear systems, interpolation, discrete Fourier transforms, and numerical integration. Applications are used as motivation.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Proposed
Components
Existing
Components

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
Yes,

Cross-Listed Courses

CS 371 - Introduction to Computational Mathematics

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Complete 1 of the following
  - Must have completed at least 1 of the following:
    - CS116 - Introduction to Computer Science 2 (0.50)
    - CS136 - Elementary Algorithm Design and Data Abstraction (0.50)
    - CS138 - Introduction to Data Abstraction and Implementation (0.50)
    - CS146 - Elementary Algorithm Design and Data Abstraction (Advanced Level) (0.50)
  - Complete all of the following
    - Must have completed at least 1 of the following:
      - CS115 - Introduction to Computer Science 1 (0.50)
      - CS135 - Designing Functional Programs (0.50)
      - CS145 - Designing Functional Programs (Advanced Level) (0.50)
    - Earned a minimum grade of 60% in each of the following:
      - CS114 - Principles of Computing for Science (0.50)
- Must have completed at least 1 of the following:
  - MATH235 - Linear Algebra 2 for Honours Mathematics (0.50)
  - MATH245 - Linear Algebra 2 (Advanced Level) (0.50)
- Must have completed at least 1 of the following:
  - MATH237 - Calculus 3 for Honours Mathematics (0.50)
  - MATH247 - Calculus 3 (Advanced Level) (0.50)

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- CS335 - Computational Methods in Business and Finance (0.50)
- CS370 - Numerical Computation (0.50)
- ECE204 - Numerical Methods (0.50)
- MTE204 - Numerical Methods (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Prerequisites

- AMATH 342 - Computational Methods for Differential Equations

View Program

Antirequisites

- CS 370 - Numerical Computation

View Program

Prerequisites

- ACTSC 447 - Numerical Computation for Financial Modelling
- CS 476 - Numerical Computation for Financial Modelling

View Program

- CS 484 - Computational Vision

View Program

Corequisites

- CS 479 - Neural Networks

View Program

Prerequisites

- CS 475 - Computational Linear Algebra

View Program

Corequisites

- AMATH 449 - Neural Networks

View Program

Antirequisites

- CS 335 - Computational Methods in Business and Finance

View Program

Course Requirements (no units)

- H-Mathematical Optimization - Operations Research Specialization - Mathematical Optimization - Operations Research Specialization (Bachelor of Mathematics - Honours)
- H-Mathematical Optimization - Business Specialization - Mathematical Optimization - Business Specialization (Bachelor of Mathematics - Honours)

View Program

- Quantum Information Option - Quantum Information Option

View Program

- H-Mathematical Physics (BMath) - Mathematical Physics (Bachelor of Mathematics - Honours)

View Program

- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours)
- JH-Applied Mathematics - Applied Mathematics (Joint Honours)

View Program

- H-Applied Mathematics with Scientific Computing & Scientific Machine Learning - Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)

View Program

- H-Mathematical Finance - Mathematical Finance (Bachelor of Mathematics - Honours)
- H-Biostatistics - Biostatistics (Bachelor of Mathematics - Honours)

View Program

- H-Statistics - Statistics (Bachelor of Mathematics - Honours)

View Program

- H-Computational Mathematics - Computational Mathematics (Bachelor of Mathematics - Honours)
- Computational Mathematics Minor - Computational Mathematics Minor

View Program

Course Lists

- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours)

View Program

Course Requirements (no units)

- H-Computer Science (BMath) - Computer Science (Bachelor of Mathematics - Honours)
- ACTSC-Finance Specialization - Finance Specialization

View Program

View Program

AMATH 361 - Continuum Mechanics

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-19

Rationale for Change
This proposal brings no changes to either what is being taught or the learning outcomes. The description is being altered to more accurately reflect what is taught in the course. We expect a better description will allow students to be more informed and this may open the course to a wider audience.

We are also revising the prerequisite and corequisite chain. The course only requires knowledge of vector calculus and mechanics and no co-requisites. This change is also in response to student feedback indicating that the previous prerequisite and corequisite structure was overly demanding and not necessary.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

Course description slightly modified as per SUC feedback.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Subject Code

AMATH

Number

361

Course Level

300

Title

Continuum Mechanics

Abbreviated Title

Continuum Mechanics

Undergraduate Communication Requirement Identifier

No,

Proposed

Description
This course presents the derivation of the equations that govern the macroscopic description of solids, liquids, and gases. The necessary mathematical tools for the description are also introduced. Topics in this course include: the continuum hypothesis, forces unique to a continuum and their mathematical description, solid materials versus flowing continua, the Lagrangian and Eulerian descriptions of flow, the Reynolds transport theorem and its use in deriving conservation laws, the Euler and Navier-Stokes Equations, and various applications.

Existing

Description
Stress and strain tensors; analysis of stress and strain. Lagrangian and Eulerian methods for describing flow. Equations of continuity, motion and energy, constitutive equations. Navier-Stokes equation. Basic equations of elasticity. Various applications.

Units
0.50

Proposed

Exceptions to Fees or Academic Progress Units

Existing

Exceptions to Fees or Academic Progress Units

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed at least 1 of the following:
   - AMATH231 - Calculus 4 (0.50)
   - **MATH227 - Calculus 3 for Honours Physics (0.50)**
   -
   - Must have completed at least 1 of the following:
   - AMATH271 - Introduction to Theoretical Mechanics (0.50)

- PHYS263 - Classical Mechanics and Special Relativity (0.50)
- ~~Must have completed the following:~~

Corequisites

1. No Rules
   - ~~Completed or concurrently enrolled in:~~
   - ~~AMATH351 - Ordinary Differential Equations (0.50)~~
   -
   - ~~Completed or concurrently enrolled in at least 1 of the following:~~
   - ~~AMATH353 - Partial Differential Equations 1 (0.50)~~
   - ~~PHYS364 - Mathematical Physics 1 (0.50)~~

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Prerequisites

- AMATH 463 - Fluid Mechanics View Program

Course Requirements (no units)

- H-Mathematical Physics (BSc) - Mathematical Physics (Bachelor of Science - Honours) View Program
- H-Mathematical Physics (BMath) - Mathematical Physics (Bachelor of Mathematics - Honours) View Program
- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours) View Program
- Engineering Specialization - Engineering Specialization View Program
- JH-Applied Mathematics - Applied Mathematics (Joint Honours) View Program

Course Requirements (units)

- Climate & Sustainability Specialization - Climate and Sustainability Specialization View Program

Course Requirements (no units)

- Physics Specialization - Physics Specialization View Program
- H-Mathematical Physics (BSc) - Mathematical Physics (Bachelor of Science - Honours) View Program

AMATH 451 - Introduction to Dynamical Systems

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-18

Rationale for Change

We are adding a tutorial component to the course. The course has always been run with a tutorial but it wasn't reflected in the calendar. This change fixes this issue.

Approved at UAC 20250929.

Approved at FC 20251028.

Course Information

Faculty

Academic Unit

Faculty of Mathematics

Department of Applied Mathematics

Subject Code
AMATH

Number
451

Course Level
400

Title
Introduction to Dynamical Systems

Abbreviated Title
Intro to Dynamical Systems

Undergraduate Communication Requirement Identifier
No,

Description
A unified view of linear and nonlinear systems of ordinary differential equations in Rn. Flow operators and their classification: contractions, expansions, hyperbolic flows. Stable and unstable manifolds. Phase-space analysis. Nonlinear systems, stability of equilibria, and Lyapunov functions. The special case of flows in the plane, Poincare-Bendixson theorem, and limit cycles. Applications to physical problems will be a motivating influence.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Proposed

Components

Existing

Components

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Must have completed at least 1 of the following:

- AMATH250 - Introduction to Differential Equations (0.50)
- AMATH251 - Introduction to Differential Equations (Advanced Level) (0.50)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (no units)

- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours)
- JH-Applied Mathematics - Applied Mathematics (Joint Honours) [View Program]

- Neural Engineering Specialization - Neural Engineering Specialization View Program

View Program

AMATH 463 - Fluid Mechanics

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-19

Rationale for Change

This proposal brings no changes to either what is being taught or the learning outcomes. The description is being altered to more accurately reflect what is taught in the course. We expect a better description will allow students to be more informed and this may open the course to a wider audience.

We are also revising the prerequisite chain. The department agrees that Continuum Mechanics is not required for this course, as it is self-contained and assumes only prior knowledge of Mechanics, Calculus, and basic partial differential equations.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

Description lightly modified as per SUC feedback.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Subject Code

AMATH

Number

463

Course Level

400

Title
Fluid Mechanics

Abbreviated Title
Fluid Mechanics

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
This course provides a broad mathematical introduction to fluid mechanics and that provides a foundation for applications such as weather and climate, oceanography, aeronautics and astrophysics. Topics in this course include: the Euler and Navier-Stokes Equations; the dynamics of vorticity; the effects of viscosity, including near solid boundaries; wave motion and dispersive waves; the effects of the Earth's rotation on flow; and an introduction to turbulence.

Existing

Description
Incompressible, irrotational flow. Incompressible viscous flow. Introduction to wave motion and geophysical fluid mechanics. Elements of compressible flow.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed at least 1 of the following:
   - **AMATH271 - Introduction to Theoretical Mechanics (0.50)**
   - **PHYS263 - Classical Mechanics and Special Relativity (0.50)**
   -
   - Must have completed at least 1 of the following:
   - **AMATH231 - Calculus 4 (0.50)**
   - **MATH227 - Calculus 3 for Honours Physics (0.50)**
   -

- Must have completed at least 1 of the following:
- AMATH353 - Partial Differential Equations 1 (0.50)
- PHYS364 - Mathematical Physics 1 (0.50)
- ~~Must have completed the following:~~
- ~~AMATH361 - Continuum Mechanics (0.50)~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (no units)

- H-Mathematical Physics (BSc) - Mathematical Physics (Bachelor of Science - Honours) View Program
- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours) View Program
- Engineering Specialization - Engineering Specialization View Program
- JH-Applied Mathematics - Applied Mathematics (Joint Honours) View Program

Course Requirements (units)

- Climate & Sustainability Specialization - Climate and Sustainability Specialization View Program

Course Requirements (no units)

- Physics Specialization - Physics Specialization View Program
- H-Mathematical Physics (BSc) - Mathematical Physics (Bachelor of Science - Honours) View Program

AMATH 499 - Research Project

Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-03-31

Rationale for Change

We propose allowing students to take this course for credit a maximum of two times to conduct a research project. This approach aligns with practices in other departments (e.g., PHYS 437A & 437B), where students can enroll in up to two research-focused courses. This change would provide students with the flexibility to either: 1. Explore two distinct research projects with different supervisors, or 2. Pursue a more extended research experience over two terms, allowing for deeper engagement and continuity in their work.

Approved at UAC 20250929.

Approved at FC 20251028.

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Subject Code
AMATH

Number
499

Course Level

400

Title
Research Project

Abbreviated Title
Research Project

Undergraduate Communication Requirement Identifier
No,

Description
A research-based course that allows students with an interest in applied mathematics or mathematical physics to participate in a research project with a faculty member. The student is required to approach a faculty member of the Department of Applied Mathematics for supervision. The enrolled student is expected to hand in a written report of their research to the supervisor and present a summary of the project orally in front of a subset of the applied mathematics undergraduate committee as a final assessment.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
ProjectSeminar

Primary Component
Seminar

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Proposed
Can this course be repeated for credit? Yes,
Existing
Can this course be repeated for credit? No,

Proposed
Total Completions Allowed 02
Existing
Total Completions Allowed

Proposed
Allow Multiple Enrol in a Term No,
Existing
Allow Multiple Enrol in a Term

Enrolment Rules

Consent to Add

Consent to Drop

Department consent required,

No consent required,

Prerequisites

Complete all of the following

- Students must be in level 4A or higher
- Complete 1 of the following
  - Enrolled in H-Applied Mathematics, JH-Applied Mathematics, H-Applied Mathematics with Scientific Computing & Scientific Machine Learning, or H-Mathematical Physics (BMath)
  - Enrolled in H-Applied Mathematics with Scientific Computing

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path

Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (no units)

- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours) View Program
- JH-Applied Mathematics - Applied Mathematics (Joint Honours) View Program

CO 442 - Graph Theory

Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type

Change,

Rationale for Change

This proposal brings no changes to either what is being taught or the learning outcomes. The description is being altered to more accurately reflect what is taught in the course. The description of CO442 will now match the description of its held-with graduate counterpart, CO 642.

Approved at UAC 20250929.

Approved at FC 20251028.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Combinatorics and Optimization

Subject Code

CO

Number

442

Course Level

400

Title

Graph Theory

Abbreviated Title
Graph Theory

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Colouring: Brooks' Theorem and Vizing's Theorem. Flows: integer and group-valued flows, the flow polynomial, the 6-flow theorem. Extremal graph theory; Ramsey's theorem, Turan's theorem, Mader's theorem on graphs with no n-clique-minor. Probabilistic methods: Lower bounds for Ramsey numbers, graphs with large girth and chromatic number.

Existing

Description
Connectivity (Menger's theorem, ear decomposition, and Tutte's wheels theorem) and matchings (Hall's theorem and Tutte's theorem). Flows: integer and group-valued flows, the flow polynomial, the 6-flow theorem. Ramsey theory: upper and lower bounds, explicit constructions. External graph theory: Turan's theorem, the Erdos-Gallai theorem. Probabilistic methods.

Units
0.50

Proposed

Exceptions to Fees or Academic Progress Units

Existing

Exceptions to Fees or Academic Progress Units

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - CO342 - Introduction to Graph Theory (0.50)

- Must have completed at least 1 of the following:
  - MATH235 - Linear Algebra 2 for Honours Mathematics (0.50)
  - MATH245 - Linear Algebra 2 (Advanced Level) (0.50)
- Earned a minimum cumulative average of 80

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (units)

- Combinatorics & Optimization Minor - Combinatorics and Optimization Minor

Course Requirements (no units) View Program

- JH-Combinatorics & Optimization - Combinatorics and Optimization (Joint Honours) View Program
- H-Combinatorics & Optimization - Combinatorics and Optimization (Bachelor of Mathematics - Honours) View Program

CS 371 - Introduction to Computational Mathematics

Top

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Offering Number
2

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-10

Rationale for Change

We wish to add a TST slot to CS 371 in the calendar to facilitate the scheduling of midterm exams.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations

CS 371 is cross listed with AMATH 242. Applied Math have been consulted and agree to this change. A similar parallel motion is proceeding through the parallel committees in Applied Math.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

David R. Cheriton School of Computer Science

Subject Code

CS

Number

371

Course Level

300

Title

Introduction to Computational Mathematics

Abbreviated Title

Intro Computational Math

Undergraduate Communication Requirement Identifier

No,

Description

A rigorous introduction to the field of computational mathematics. The focus is on the interplay between continuous models and their solution via discrete processes. Topics include pitfalls in computation, solution of linear systems, interpolation, discrete Fourier transforms, and numerical integration. Applications are used as motivation.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Proposed
Components
Existing
Components

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
Yes,

Cross-Listed Courses

AMATH 242 - Introduction to Computational Mathematics

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Complete 1 of the following
  - Must have completed at least 1 of the following:
    - CS116 - Introduction to Computer Science 2 (0.50)
    - CS136 - Elementary Algorithm Design and Data Abstraction (0.50)
    - CS138 - Introduction to Data Abstraction and Implementation (0.50)
    - CS146 - Elementary Algorithm Design and Data Abstraction (Advanced Level) (0.50)
  - Complete all of the following
    - Must have completed at least 1 of the following:
      - CS115 - Introduction to Computer Science 1 (0.50)
      - CS135 - Designing Functional Programs (0.50)
      - CS145 - Designing Functional Programs (Advanced Level) (0.50)
    - Earned a minimum grade of 60% in each of the following:
      - CS114 - Principles of Computing for Science (0.50)
- Must have completed at least 1 of the following:
  - MATH235 - Linear Algebra 2 for Honours Mathematics (0.50)
  - MATH245 - Linear Algebra 2 (Advanced Level) (0.50)
- Must have completed at least 1 of the following:
  - MATH237 - Calculus 3 for Honours Mathematics (0.50)

- MATH247 - Calculus 3 (Advanced Level) (0.50)

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- CS335 - Computational Methods in Business and Finance (0.50)
- CS370 - Numerical Computation (0.50)
- ECE204 - Numerical Methods (0.50)
- MTE204 - Numerical Methods (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Prerequisites

- AMATH 342 - Computational Methods for Differential Equations

View Program

Antirequisites

- CS 370 - Numerical Computation
- ECE 204 - Numerical Methods

View Program

View Program

Prerequisites

- ACTSC 447 - Numerical Computation for Financial Modelling
- CS 476 - Numerical Computation for Financial Modelling
- CS 488 - Introduction to Computer Graphics
- CS 484 - Computational Vision

View Program

View Program

View Program

Corequisites

- CS 479 - Neural Networks

View Program

Prerequisites

- CS 475 - Computational Linear Algebra

View Program

Corequisites

- AMATH 449 - Neural Networks

View Program

Antirequisites

- CS 335 - Computational Methods in Business and Finance

View Program

Course Requirements (no units)

- H-Mathematical Optimization - Operations Research Specialization - Mathematical Optimization - Operations Research Specialization (Bachelor of Mathematics - Honours)
- H-Mathematical Optimization - Business Specialization - Mathematical Optimization - Business Specialization (Bachelor of Mathematics - Honours)
- H-Mathematics/Teaching - Mathematics/Teaching (Bachelor of Mathematics - Honours)
- Quantum Information Option - Quantum Information Option
- H-Mathematical Physics (BMath) - Mathematical Physics (Bachelor of Mathematics - Honours)
- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours)
- JH-Applied Mathematics - Applied Mathematics (Joint Honours)
- H-Applied Mathematics with Scientific Computing & Scientific Machine Learning - Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)
- H-Mathematical Finance - Mathematical Finance (Bachelor of Mathematics - Honours)
- H-Biostatistics - Biostatistics (Bachelor of Mathematics - Honours)
- H-Statistics - Statistics (Bachelor of Mathematics - Honours)
- H-Computational Mathematics - Computational Mathematics (Bachelor of Mathematics - Honours)
- Computational Mathematics Minor - Computational Mathematics Minor

View Program

View Program

View Program

View Program

View Program

View Program

View Program

View Program

View Program

Course Lists

- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours)

View Program

Course Requirements (no units)

- H-Computer Science (BMath) - Computer Science (Bachelor of Mathematics - Honours) View Program
- ACTSC-Finance Specialization - Finance Specialization View Program

CS 431 - Data-Intensive Distributed Analytics

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-04

Rationale for Change

CS230 is replacing CS330 as one of the potential prerequisites for CS431. CS230 (similarly to the alternate prerequisites CS251 and CS251E) provides background about the computer systems on which distributed data analytics computations are performed. CS330 is less relevant than CS230 to CS431 because CS330 focuses on the business aspects of information systems.

Approved at UAC 20250623.

Approved at FC 20251028.

Consultations

Approved at Computer Science Undergraduate Academic Plans Committee (UAPC) June 3, 2025.
Approved at School of Computer Science Council June 4, 2025.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

David R. Cheriton School of Computer Science

Subject Code

CS

Number

431

Course Level

400

Title

Data-Intensive Distributed Analytics

Abbreviated Title
Data-Intense Distrib Analytics

Undergraduate Communication Requirement Identifier
No,

Description
Introduces non-CS major students to infrastructure for data-intensive analytics, with a focus on abstractions, frameworks, and algorithms that allow developers to distribute computation across many machines. Topics include core concepts (partitioning, replication, locality, consistency), computational models (Map Reduce, dataflows, stream processing, bulk-synchronous parallel), and applications.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTest Slot

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed at least 1 of the following:
   - **CS230 - Introduction to Computers and Computer Systems (0.50)**
   - CS251 - Computer Organization and Design (0.50)
   - CS251E - Computer Organization and Design (Enriched) (0.50)
   -
   - Must have completed at least 1 of the following:
   - CS231 - Algorithmic Problem Solving (0.50)
   - CS234 - Data Types and Structures (0.50)
   - CS341 - Algorithms (0.50)
   - ~~CS330 - Management Information Systems (0.50)~~

Corequisites

No Rules

Antirequisites

Complete all of the following

- Not completed nor concurrently enrolled in:
  - CS451 - Data-Intensive Distributed Computing (0.50)
- Not open to students enrolled in H-BBA & BCS Double Degree, H-Computer Science (BCS), H-Computer Science (BMath), JH-Computer Science (BCS), JH-Computer Science (BMath), H-Computing & Financial Management, H-Data Science (BCS), or H-Software Engineering

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (no units)

- H-Computational Mathematics - Computational Mathematics (Bachelor of Mathematics - Honours)
- Computational Mathematics Minor - Computational Mathematics Minor
- H-Data Science (BMath) - Data Science (Bachelor of Mathematics - Honours)

View Program

CS 459 - Privacy, Cryptography, Network and Data Security

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-04

Rationale for Change

ECE 358 is comparable to CS 456 in the background on computer networks that it provides to students for the purpose of taking CS 459. Bachelor of Software Engineering students are required to take ECE 358, which is an antirequisite of CS 456, so they cannot take CS 456. The change will enable BSE students to take CS 459 having learned the necessary background on computer networks in ECE 358.

Though there is no anti-requisite that would prevent BSE students from satisfying the co-requisite using CS 454 rather than CS 456, that would require them to acquire more background than is necessary and thus unnecessarily constrain their choices of technical electives. The existing CS 459 co-requisite requires EITHER CS 454 OR CS 456, and ECE 358 provides sufficient background equivalent to CS 456.

Approved at UAC 20250623.

Approved at FC 20251028.

Consultations

Requested by Associate Director of Bachelor of Software Engineering Paul Ward May 26, 2025.

Approved at Computer Science Undergraduate Academic Plans Committee (UAPC) June 3, 2025.
Approved at School of Computer Science Council June 4, 2025.

Course Information

Faculty

Faculty of Mathematics

Academic Unit

David R. Cheriton School of Computer Science

Subject Code
CS

Number
459

Course Level
400

Title
Privacy, Cryptography, Network and Data Security

Abbreviated Title
Privacy, Crypto & Security

Undergraduate Communication Requirement Identifier
No,

Description
Introduction to privacy and security using cryptography and related techniques in networks, distributed systems, and data science. The course examines how data and metadata can be protected at rest, in transit, and during computation. For at-rest protection, specific topics include the basics of cryptography and relevant ethics/policy concepts. For in-transit protection, specific topics include network defenses, authentication, and secure and anonymous communication protocols. For during-computation protection, specific topics include data inference, differential privacy, homomorphic encryption, multi-party computations, and related protocols.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTest Slot

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed at least 1 of the following:
  - CS350 - Operating Systems (0.50)
  - SE350 - Operating Systems (0.50)
- Must have completed at least 1 of the following:
  - MATH135 - Algebra for Honours Mathematics (0.50)
  - MATH145 - Algebra (Advanced Level) (0.50)

- Enrolled in H-BBA & BCS Double Degree, H-Computer Science (BCS), H-Computer Science (BMath), JH-Computer Science (BCS), JH-Computer Science (BMath), H-Computing & Financial Management, H-Data Science (BCS), or H-Software Engineering

Corequisites

1. Completed or concurrently enrolled in at least 1 of the following:
    - CS454 - Distributed Systems (0.50)
    - CS456 - Computer Networks (0.50)
    - **ECE358 - Computer Networks (0.50)**

Antirequisites

Not completed nor concurrently enrolled in: CS489 (Topic 24: Privacy, Crypto, Data Security)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Course Requirements (no units)

- CS-Software Engineering Specialization - Software Engineering Specialization View Program
- SE-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization View Program
- CS-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization View Program

Course Lists

- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours) View Program

H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours)

Top

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-19

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

We have added four courses to the list of eligible 400-level Applied Mathematics courses: AMATH 449 (new as of Fall 2025, cross-listed with CS 479) and AMATH 446, AMATH 462, AMATH 490, which are all new course proposals currently under review with Fall 2026 effective dates.

This is a required update to reflect a prior change in our program requirements, where we transitioned from a general statement—"choose three 400-level AMATH courses"—to explicitly listing all eligible courses. This update ensures consistency and clarity in course selection for students.

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Major

Program Type

Honours

Degree
Bachelor of Mathematics

Program/Plan Name
Applied Mathematics (Bachelor of Mathematics - Honours)

Systems of Study
Co-operative, Regular,

Admissions

Admissions Entry Point
Declare Plan,

Declaration Requirements

- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations

Yes,

List of Invalid Combinations

Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)

Data Science (Bachelor of Computer Science - Honours)

Data Science (Bachelor of Mathematics - Honours)

Mathematical Physics (Bachelor of Mathematics - Honours)

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 65.0%: all math courses.

Graduation Requirements

- See Bachelor of Mathematics degree-level requirements.
- Complete all the required courses listed below.
- Complete a minimum of 13.0 units of math courses.

- Complete a minimum of 5.0 units of non-math courses.

Co-operative Education Program Requirements

For students in the co-operative system of study, see Bachelor of Mathematics co-operative education program requirements.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete all of the following
    - Complete all the following:
    - AMATH231 - Calculus 4 (0.50)
    - AMATH342 - Computational Methods for Differential Equations (0.50)
    - AMATH353 - Partial Differential Equations 1 (0.50)
    -
    - Complete 1 of the following:
    - AMATH242 - Introduction to Computational Mathematics (0.50)
    - CS371 - Introduction to Computational Mathematics (0.50)
    -
    - Complete 1 of the following:
    - AMATH250 - Introduction to Differential Equations (0.50)
    - AMATH251 - Introduction to Differential Equations (Advanced Level) (0.50)
    -
    - Complete 1 of the following
    - Complete all the following:
    - AMATH271 - Introduction to Theoretical Mechanics (0.50)
    -
    - Complete 1 of the following:
    - AMATH333 - Calculus on Manifolds for Applied Mathematics and Physics (0.50)
    - AMATH343 - Discrete Models in Applied Mathematics (0.50)
    - AMATH345 - Data-Driven Mathematical Models (0.50)
    - AMATH361 - Continuum Mechanics (0.50)

- AMATH362 - Mathematics of Climate Change (0.50)
- AMATH373 - Quantum Theory 1 (0.50)
- AMATH382 - Computational Modelling of Cellular Systems (0.50)
- AMATH383 - Introduction to Mathematical Biology (0.50)
- AMATH390 - Mathematics and Music (0.50)
- AMATH391 - Data Analysis with Fourier and Wavelet Methods (0.50)
- PMATH343 - Introduction to the Mathematics of Quantum Information (0.50)
-
- Complete 1 of the following:
- AMATH331 - Applied Real Analysis (0.50)
- AMATH332 - Applied Complex Analysis (0.50)
- PMATH331 - Applied Real Analysis (0.50)
- PMATH332 - Applied Complex Analysis (0.50)
- PMATH333 - Introduction to Real Analysis (0.50)
- PMATH351 - Real Analysis (0.50)
- PMATH352 - Complex Analysis (0.50)
-
- Complete 3 of the following:
- AMATH442 - Computational Methods for Partial Differential Equations (0.50)
- AMATH445 - Scientific Machine Learning (0.50)
- AMATH451 - Introduction to Dynamical Systems (0.50)
- AMATH453 - Partial Differential Equations 2 (0.50)
- AMATH455 - Control Theory (0.50)
- AMATH456 - Calculus of Variations (0.50)
- AMATH463 - Fluid Mechanics (0.50)
- AMATH473 - Quantum Theory 2 (0.50)
- AMATH474 - Quantum Theory 3: Quantum Information and Foundations (0.50)
- AMATH475 - Introduction to General Relativity (0.50)
- AMATH477 - Stochastic Processes for Applied Mathematics (0.50)
- **Course Not Found**
- AMATH495 - Reading Course (0.50)
- AMATH499 - Research Project (0.50)
- **AMATH449 - Neural Networks (0.50)**
- **CS479 - Neural Networks (0.50)**
- **Course Not Found**
- **Course Not Found**
-
- Complete 1 of the following:
- MATH237 - Calculus 3 for Honours Mathematics (0.50)
- MATH247 - Calculus 3 (Advanced Level) (0.50)
-
- Complete 1 additional AMATH course at the 300- or 400-level
- Subject concentration: Complete 4 additional courses, all from any one (and only one) of the following subject codes: AE, BIOL, BME/SYDE, CHE, CHEM, CIVE, EARTH, ECE, ECON, ENVE, GEOE, GEOG, ME/MTE, MNS, MSE, NE, PHYS

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Students may only complete one course from any cross-listed set.
2. For the subject concentration requirement, a set of four courses from another academic unit may be eligible, subject to approval by the Applied Mathematics academic advisor.

Specializations

Specializations for this Major

Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one of five available specializations.

Specializations List

Biology Specialization, Climate & Sustainability Specialization, Economics Specialization, Engineering Specialization, or Physics Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Mathematics

Dependencies

JH-Applied Mathematics - Applied Mathematics (Joint Honours)

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type

Academic Unit Approval

Change, 2025-06-19

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

We have added four courses to the list of eligible 400-level Applied Mathematics courses: AMATH 449 (new as of Fall 2025, cross-listed with CS 479) and AMATH 446, AMATH 462, AMATH 490, which are all new course proposals currently under review with Fall 2026 effective dates.

This is a required update to reflect a prior change in our program requirements, where we transitioned from a general statement—"choose three 400-level AMATH courses"—to explicitly listing all eligible courses. This update ensures consistency and clarity in course selection for students.

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Major

Program Type

Joint Honours

Program/Plan Name

Applied Mathematics (Joint Honours)

Systems of Study
Co-operative, Regular,

Admissions

Admissions Entry Point
Declare Plan,

Declaration Requirements

- Must be combined with at least one other major or joint major (Bachelors of Mathematics).
- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations

Yes,

List of Invalid Combinations

Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)

Data Science (Bachelor of Computer Science - Honours)

Data Science (Bachelor of Mathematics - Honours)

Mathematical Physics (Bachelor of Mathematics - Honours)

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 65.0%: all math courses.

Graduation Requirements

- See Bachelor of Mathematics (BMath) degree-level requirements.
- Complete all the required courses listed below.
- Complete a minimum of 13.0 units of math courses.
- Complete a minimum of 5.0 units of non-math courses.

- Complete the requirements for at least one other BMath major or joint major.

Co-operative Education Program Requirements

For students in the co-operative system of study, see Bachelor of Mathematics co-operative education program requirements.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete all of the following
    - Complete all the following:
    - AMATH231 - Calculus 4 (0.50)
    - AMATH353 - Partial Differential Equations 1 (0.50)
    -
    - Complete 1 of the following:
    - AMATH242 - Introduction to Computational Mathematics (0.50)
    - CS371 - Introduction to Computational Mathematics (0.50)
    -
    - Complete 1 of the following:
    - AMATH250 - Introduction to Differential Equations (0.50)
    - AMATH251 - Introduction to Differential Equations (Advanced Level) (0.50)
    -
    - Complete 1 of the following
    - Complete all the following:
    - AMATH271 - Introduction to Theoretical Mechanics (0.50)
    -
    - Complete 1 of the following:
    - AMATH333 - Calculus on Manifolds for Applied Mathematics and Physics (0.50)
    - AMATH343 - Discrete Models in Applied Mathematics (0.50)
    - AMATH345 - Data-Driven Mathematical Models (0.50)
    - AMATH361 - Continuum Mechanics (0.50)
    - AMATH362 - Mathematics of Climate Change (0.50)

- AMATH373 - Quantum Theory 1 (0.50)
- AMATH382 - Computational Modelling of Cellular Systems (0.50)
- AMATH383 - Introduction to Mathematical Biology (0.50)
- AMATH390 - Mathematics and Music (0.50)
- AMATH391 - Data Analysis with Fourier and Wavelet Methods (0.50)
- PMATH343 - Introduction to the Mathematics of Quantum Information (0.50)
-
- Complete 1 of the following:
- AMATH331 - Applied Real Analysis (0.50)
- AMATH332 - Applied Complex Analysis (0.50)
- PMATH331 - Applied Real Analysis (0.50)
- PMATH332 - Applied Complex Analysis (0.50)
- PMATH333 - Introduction to Real Analysis (0.50)
- PMATH351 - Real Analysis (0.50)
- PMATH352 - Complex Analysis (0.50)
-
- Complete 3 of the following:
- AMATH442 - Computational Methods for Partial Differential Equations (0.50)
- AMATH445 - Scientific Machine Learning (0.50)
- AMATH451 - Introduction to Dynamical Systems (0.50)
- AMATH453 - Partial Differential Equations 2 (0.50)
- AMATH455 - Control Theory (0.50)
- AMATH456 - Calculus of Variations (0.50)
- AMATH463 - Fluid Mechanics (0.50)
- AMATH473 - Quantum Theory 2 (0.50)
- AMATH474 - Quantum Theory 3: Quantum Information and Foundations (0.50)
- AMATH475 - Introduction to General Relativity (0.50)
- AMATH477 - Stochastic Processes for Applied Mathematics (0.50)
- AMATH495 - Reading Course (0.50)
- AMATH499 - Research Project (0.50)
- **Course Not Found**
- **AMATH449 - Neural Networks (0.50)**
- **CS479 - Neural Networks (0.50)**
- **Course Not Found**
- **Course Not Found**
-
- Complete 1 of the following:
- MATH237 - Calculus 3 for Honours Mathematics (0.50)
- MATH247 - Calculus 3 (Advanced Level) (0.50)
-
- Subject concentration: Complete 4 additional courses, all from any one (and only one) of the following subject codes: AE, BIOL, BME/SYDE, CHE, CHEM, CIVE, EARTH, ECE, ECON, ENVE, GEOE, GEOG, ME/MTE, MNS, MSE, NE, PHYS.

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. Students may only complete one course from any cross-listed set.
2. For the subject concentration requirement, a set of four courses from another academic unit may be eligible, subject to approval by the Applied Mathematics academic advisor.

Existing

Additional Constraints

1. For the subject concentration requirement, a set of four courses from another academic unit may be eligible, subject to approval by the Applied Mathematics academic advisor.

Specializations

Specializations for this Major
No,

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Mathematics

Senate Workflow
Senate Consent,

Dependencies

H-Applied Mathematics with Scientific Computing & Scientific Machine Learning - Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-19

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

We are including AMATH 345 to the options in the List 1 requirement, so long as the student did not take it to satisfy any other core requirement (as per Additional Constraint 1). This was intended to happen at an early stage but was omitted from the original plan proposal.

AMATH 345 is a natural fit for this plan because it introduces data-driven mathematical modeling techniques that are central to the fields of scientific computing and machine learning. The course provides students with hands-on experience in tools such as neural networks, compressed sensing, and parameter inference, all of which directly support the program's goal of training students in modern computational methods for scientific applications.

In the same spirit, we are also including AMATH 446: Introduction to Mathematics of Deep Learning as a new option within the List 1 requirement. This course aims to introduce senior undergraduates to the mathematics underlying deep learning. In addition to covering the foundational concepts of deep neural networks, AMATH 446 emphasizes three core theoretical aspects of the field—approximation, optimization, and generalization—presented in mathematically self-contained form and with accessible proofs. These topics represent essential theoretical pillars of deep learning, and their inclusion further strengthens the plan's emphasis on modern, computationally grounded approaches to applied mathematics. The course complements the course offerings and enhances students' preparation for research or industry work in scientific machine learning and data-driven modeling.

Also Added to list one CO481 and PHYS467 because they are cross-listed (and actually the same course by the same instructor in the same class) as CS467 so they can be used equivalently.

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Major

Program Type

Honours

Degree

Bachelor of Mathematics

Program/Plan Name

Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)

Systems of Study
Co-operative, Regular,

Admissions

Admissions Entry Point
Declare Plan,

Declaration Requirements

Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations
Yes,

List of Invalid Combinations

Applied Mathematics (Bachelor of Mathematics - Honours)

Applied Mathematics (Joint Honours)

Applied Mathematics Minor

Computational Mathematics (Bachelor of Mathematics - Honours)

Computational Mathematics Minor

Data Science (Bachelor of Computer Science - Honours)

Data Science (Bachelor of Mathematics - Honours)

Mathematical Physics (Bachelor of Mathematics - Honours)

Mathematics/Financial Analysis and Risk Management - Chartered Financial Analyst Specialization (Bachelor of Mathematics - Honours)

Mathematics/Financial Analysis and Risk Management - Professional Risk Management Specialization (Bachelor of Mathematics - Honours)

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 65.0%: all math courses.

Graduation Requirements

- See Bachelor of Mathematics degree-level requirements.
- Complete all the required courses listed below.
- Complete a minimum of 13.0 units of math courses.
- Complete a minimum of 5.0 units of non-math courses.

Co-operative Education Program Requirements

For students in the co-operative system of study, see Bachelor of Mathematics co-operative education program requirements.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete all of the following
    - Complete all the following:
    - AMATH231 - Calculus 4 (0.50)
    - AMATH445 - Scientific Machine Learning (0.50)
    - CS234 - Data Types and Structures (0.50)
    -
    - Complete 1 of the following:
    - AMATH242 - Introduction to Computational Mathematics (0.50)
    - CS371 - Introduction to Computational Mathematics (0.50)
    -
    - Complete 1 of the following:
    - AMATH250 - Introduction to Differential Equations (0.50)
    - AMATH251 - Introduction to Differential Equations (Advanced Level) (0.50)
    -
    - Complete 1 of the following:
    - AMATH342 - Computational Methods for Differential Equations (0.50)
    - AMATH345 - Data-Driven Mathematical Models (0.50)
    - AMATH449 - Neural Networks (0.50)

- CS479 - Neural Networks (0.50)
-
- Complete 1 of the following:
- CO250 - Introduction to Optimization (0.50)
- CO255 - Introduction to Optimization (Advanced Level) (0.50)
-
- Complete 1 of the following:
- MATH237 - Calculus 3 for Honours Mathematics (0.50)
- MATH247 - Calculus 3 (Advanced Level) (0.50)
-
- Complete 2 additional AMATH courses at the 300- or 400-level
- Complete 1 additional AMATH course at the 400-level
- Complete 4 additional courses from the options in List 1
-
- List 1
-
- Complete 4 of the following:
- AMATH342 - Computational Methods for Differential Equations (0.50)
- AMATH391 - Data Analysis with Fourier and Wavelet Methods (0.50)
- AMATH442 - Computational Methods for Partial Differential Equations (0.50)
- AMATH449 - Neural Networks (0.50)
- AMATH477 - Stochastic Processes for Applied Mathematics (0.50)
- CO367 - Nonlinear Optimization (0.50)
- CO466 - Continuous Optimization (0.50)
- CS231 - Algorithmic Problem Solving (0.50)
- CS467 - Introduction to Quantum Information Processing (0.50)
- CS475 - Computational Linear Algebra (0.50)
- CS479 - Neural Networks (0.50)
- PMATH343 - Introduction to the Mathematics of Quantum Information (0.50)
- STAT331 - Applied Linear Models (0.50)
- STAT341 - Computational Statistics and Data Analysis (0.50)
- STAT441 - Statistical Learning - Classification (0.50)
- STAT444 - Statistical Learning - Advanced Regression (0.50)
- AMATH345 - Data-Driven Mathematical Models (0.50)
- **CO481 - Introduction to Quantum Information Processing (0.50)**
- **PHYS467 - Introduction to Quantum Information Processing (0.50)**
- **Course Not Found**

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Courses used to satisfy core program requirements cannot be used to satisfy requirements on List 1.
2. Students may only complete one course from any cross-listed set.

Specializations

Specializations for this Major
No,

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Top

Climate & Sustainability Specialization - Climate and Sustainability Specialization

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-19

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?

No,

Co-operative System of Study and Requirements

No,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

A new course, AMATH 462: Introduction to Mathematics of Climate Modelling, has been developed to enhance the range of electives available for this specialization. The course aligns well with the learning objectives of the specialization and provides valuable interdisciplinary training in applied mathematics and climate science. It is therefore being proposed as an approved elective within the specialization.

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Applied Mathematics

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Specialization

Program/Plan Name

Climate and Sustainability Specialization

Admissions

Specialization is available for students in the following majors

H-Applied Mathematics

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
No,

Graduation Requirements

- Complete a total of 3.5 to 4 units of required courses.

1. Required Courses
    - 3.5Units to Complete
    -
    - Complete all of the following
    - Complete all the following:
    - AMATH361 - Continuum Mechanics (0.50)
    - AMATH362 - Mathematics of Climate Change (0.50)
    - GEOG207 - Climate Change Fundamentals (0.50)
    -
    - Complete 1 of the following:
    - AMATH442 - Computational Methods for Partial Differential Equations (0.50)
    - AMATH463 - Fluid Mechanics (0.50)
    -
    - Complete 3 of the following:
    - GEOG102 - Global Environmental Systems: Processes and Change (0.50)
    - GEOG205 - Principles of Geomorphology (0.50)
    - GEOG209 - Hydroclimatology (0.50)
    - GEOG271 - Earth from Space Using Remote Sensing (0.50)
    - GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - GEOG303 - Physical Hydrology (0.50)
    - GEOG305 - Fluvial Geomorphology (0.50)
    - GEOG307 - Societal Adaptation to Climate Change (0.50)
    - GEOG309 - Physical Climatology (0.50)
    - GEOG320 - The Cryosphere (0.50)
    - GEOG408 - Earth's Future Climates (0.50)
    - PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - **Course Not Found**
    -
    - Grand Total Units: 3.5

Course Requirements (no units)

Required Courses

- No Rules

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Students may only complete one course from any cross-listed set.
2. Courses used to satisfy this Specialization cannot be used to satisfy the AMATH courses at the 300- or 400-level requirement of the Honours Applied Mathematics academic plan.
3. GEOG courses can be used to fulfil the subject concentration requirement of the Honours Applied Mathematics academic plan.

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Combinatorics & Optimization Minor - Combinatorics and Optimization Minor

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2023

Proposal Details

Proposal Type
Change,

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Not Applicable,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

This change removes MATH 103 from the 'at least one of the following' list of algebra courses for the CO minor. The change aligns the linear algebra prerequisites for CO minor exactly with those of CO 250.

It didn't make sense for MATH 103 to be on the list, because it is subsumed by another course on the same list : MATH 106. In practice, a student taking MATH 103 and no other course on this list will not satisfy the prerequisites for CO 250, and will be unable to complete the CO minor regardless.

An alternative option would have been to add MATH 103 as an allowed prerequisite for CO 250, but this would probably allow students with an inadequate background.

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Combinatorics and Optimization

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Minor

Program/Plan Name

Combinatorics and Optimization Minor

Admissions

Admissions Entry Point
Declare Plan,

Declaration Audience
This credential is open to students enrolled in any degree program.

Declaration Requirements

- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations

Yes,

List of Invalid Combinations

Mathematics (Joint Honours)

Mathematics Minor

Average Requirement

No,

Graduation Requirements

- Complete a total of 4.0 units.

1. Required Courses
    - 4Units to Complete
    -
    - Complete all of the following
    - Complete 1 of the following:
    - CO250 - Introduction to Optimization (0.50)
    - CO255 - Introduction to Optimization (Advanced Level) (0.50)
    -
    - Complete 3 of the following:
    - CO330 - Combinatorial Enumeration (0.50)
    - CO331 - Coding Theory (0.50)
    - CO342 - Introduction to Graph Theory (0.50)
    - CO351 - Network Flow Theory (0.50)
    - CO353 - Computational Discrete Optimization (0.50)
    - CO367 - Nonlinear Optimization (0.50)
    - CO370 - Deterministic OR Models (0.50)
    - CO372 - Portfolio Optimization Models (0.50)
    - CO430 - Algebraic Enumeration (0.50)
    - CO431 - Symmetric Functions (0.50)
    - CO432 - Information Theory and Applications (0.50)
    - CO434 - Combinatorial Designs (0.50)
    - CO439 - Topics in Combinatorics (0.50)
    - CO440 - Topics in Graph Theory (0.50)
    - CO442 - Graph Theory (0.50)
    - CO444 - Algebraic Graph Theory (0.50)

- CO446 - Matroid Theory (0.50)
- CO450 - Combinatorial Optimization (0.50)
- CO452 - Integer Programming (0.50)
- CO454 - Scheduling (0.50)
- CO456 - Introduction to Game Theory (0.50)
- CO459 - Topics in Optimization (0.50)
- CO463 - Convex Optimization and Analysis (0.50)
- CO466 - Continuous Optimization (0.50)
- CO471 - Semidefinite Optimization (0.50)
- CO481 - Introduction to Quantum Information Processing (0.50)
- CO485 - The Mathematics of Public-Key Cryptography (0.50)
- CO486 - Topics in Quantum Information (0.50)
- CO487 - Applied Cryptography (0.50)
- CS467 - Introduction to Quantum Information Processing (0.50)
- PHYS467 - Introduction to Quantum Information Processing (0.50)
-
- Complete 1 of the following:
- MATH106 - Applied Linear Algebra 1 (0.50)
- MATH114 - Linear Algebra for Science (0.50)
- MATH115 - Linear Algebra for Engineering (0.50)
- MATH136 - Linear Algebra 1 for Honours Mathematics (0.50)
- MATH146 - Linear Algebra 1 (Advanced Level) (0.50)
-
- Complete 1 of the following:
- MATH104 - Introductory Calculus for Arts and Social Science (0.50)
- MATH116 - Calculus 1 for Engineering (0.50)
- MATH117 - Calculus 1 for Engineering (0.50)
- MATH127 - Calculus 1 for the Sciences (0.50)
- MATH137 - Calculus 1 for Honours Mathematics (0.50)
- MATH147 - Calculus 1 (Advanced Level) (0.50)
-
- Complete 1 of the following:
- MATH135 - Algebra for Honours Mathematics (0.50)
- MATH145 - Algebra (Advanced Level) (0.50)
-
- Complete 1 of the following:
- MATH239 - Introduction to Combinatorics (0.50)
- MATH249 - Introduction to Combinatorics (Advanced Level) (0.50)
-
- Grand Total Units: 4
- ~~MATH103 - Introductory Algebra for Arts and Social Science (0.50)~~

Course Requirements (no units)

Required Courses

- No Rules

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?
Yes,

Cross-Listings Options
All cross-listings to be displayed,

Specializations

Undergraduate Plan Guidelines

Adherence to Academic Plan Guidelines
Yes,

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

CS-Bioinformatics Specialization - Bioinformatics Specialization

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-10

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?

No,

Is the credential name changing?

No,

Co-operative System of Study and Requirements

Not Applicable,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

Removal of the Breadth and Depth Requirement effective September 2026 has received Senate approval. The Elective Requirement that replaces the Breadth and Depth Requirement was designed specifically to not require exemptions in Specializations.

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

David R. Cheriton School of Computer Science

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Specialization

Program/Plan Name

Bioinformatics Specialization

Admissions

Specialization is available for students in the following majors

H-BBA & BCS Double Degree, H-Computer Science (BCS), or H-Computer Science (BMath)

Admissions Entry Point

Declare Plan,

Declaration Requirements

- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations

Yes,

List of Invalid Combinations

Biochemistry (Bachelor of Science - Honours)

Biochemistry - Biotechnology Specialization (Bachelor of Science - Honours)

Biochemistry Minor

Bioinformatics Option

Biology (Bachelor of Science - Honours)

Biology Minor

Biomedical Sciences (Bachelor of Science - Honours)

Biophysics Minor

Environmental Sciences - Ecology Specialization (Bachelor of Science - Honours)

Environmental Sciences - Geoscience Specialization (Bachelor of Science - Honours)

Environmental Sciences - Water Science Specialization (Bachelor of Science - Honours)

Science and Business - Biochemistry Specialization (Bachelor of Science - Honours)

Science and Business - Biology Specialization (Bachelor of Science - Honours)

Science and Business - Biotechnology Specialization (Bachelor of Science - Honours)

Average Requirement

No,

Proposed

Graduation Requirements

- Complete a total of 5.5 units.

Existing

Graduation Requirements

- Complete a total of 5.5 units.
- Elective breadth and depth requirements for the Computer Science major are waived.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

Course Requirements (no units)

Required Courses

- Complete all the following:
- BIOL130 - Introductory Cell Biology (0.50)
- BIOL130L - Cell Biology Laboratory (0.25)
- BIOL239 - Genetics (0.50)
- BIOL240 - Fundamentals of Microbiology (0.50)
- BIOL240L - Microbiology Laboratory (0.25)
- BIOL308 - Principles of Molecular Biology (0.50)
- BIOL365 - Methods in Bioinformatics (0.50)
- BIOL465 - Structural Bioinformatics (0.50)
- CHEM120 - General Chemistry 1 (0.50)
- CHEM120L - General Chemistry Laboratory 1 (0.25)
- CHEM123 - General Chemistry 2 (0.50)
- CHEM123L - General Chemistry Laboratory 2 (0.25)
- CS482 - Computational Techniques in Biological Sequence Analysis (0.50)

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?
No,

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

H-Actuarial Science - Actuarial Science (Bachelor of Mathematics - Honours)

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-27

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements

Not Applicable,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

The proposed changes to the ACTSC major requirements update the required content to better reflect the increasing importance of statistical learning and related topics in the actuarial profession.

The requirement of STAT 341 specifically, as opposed to a choice between STAT 340 and 341, ensures students have the foundational computational and data analysis skills required in the profession, and it opens the opportunity to deepen their knowledge in computational methods and statistical learning with courses such as STAT 440, 441, 442, and 444 that all require STAT 341 as a pre-requisite.

These changes also better align the ACTSC major with the curriculum requirements of the professional organizations' accreditation processes. By making STAT 341 a requirement for all students, all ACTSC major students will be able to meet the CIA's University Accreditation Program (UAP) requirements, provided they take ACTSC 456 as one of their required "2 additional 4XX ACTSC courses".
The removal of STAT 340 as a requirement for all ACTSC major students is deemed appropriate based on the continued inclusion of applications of simulation in several ACTSC courses including ACTSC 431, ACTSC 447, and ACTSC 455.

Finally, since the content in STAT 440 and STAT 444 is becoming increasingly important in the actuarial profession, we add these two courses to the list of choices for the "2 additional of ACTSC 3XX-4XX, AFM 424, STAT 431/433/441/443".

Approved at UAC 20250929.

Approved at FC 20251028.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Statistics and Actuarial Science

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Major

Program Type

Honours

Degree

Bachelor of Mathematics

Program/Plan Name

Actuarial Science (Bachelor of Mathematics - Honours)

Systems of Study
Co-operative, Regular,

Admissions

Admissions Entry Point
Declare Plan,

Declaration Requirements

- To declare Actuarial Science as a major, students are required to have:
  - Completed MTHEL131 with a minimum grade of 60.0%; or, for Business Administration and Mathematics Double degree students, a minimum grade of C- in BUS121W.
  - A minimum major average (MAV) of 70.0%; or, if a MAV does not yet exist, a minimum cumulative average of 70.0% with at least 10 passed courses.
- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations

Yes,

List of Invalid Combinations

Data Science (Bachelor of Computer Science - Honours)

Data Science (Bachelor of Mathematics - Honours)

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 70.0%: all ACTSC231, ACTSC232, STAT230 or STAT240, STAT231 or STAT241, and all math courses at the 300- or 400-level.

Graduation Requirements

- See Bachelor of Mathematics degree-level requirements.
- Complete all the required courses listed below.
- Complete a minimum of 13.0 units of math courses.

- Complete a minimum of 5.0 units of non-math courses.

Co-operative Education Program Requirements

For students in the co-operative system of study, see Bachelor of Mathematics co-operative education program requirements.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete all of the following
    - Complete all the following:
    - ACTSC231 - Introductory Financial Mathematics (0.50)
    - ACTSC232 - Life Contingencies 1 (0.50)
    - ACTSC331 - Life Contingencies 2 (0.50)
    - ACTSC363 - Casualty and Health Insurance Mathematics 1 (0.50)
    - ACTSC372 - Investment Science and Corporate Finance (0.50)
    - ACTSC431 - Casualty and Health Insurance Mathematics 2 (0.50)
    - ACTSC446 - Mathematics of Financial Markets (0.50)
    - AFM101 - Introduction to Financial Accounting (0.50)
    - ECON101 - Introduction to Microeconomics (0.50)
    - ECON102 - Introduction to Macroeconomics (0.50)
    - ENGL378 - Professional Communications in Statistics and Actuarial Science (0.50)
    - MTHEL131 - Introduction to Actuarial Practice (0.50)
    - STAT330 - Mathematical Statistics (0.50)
    - STAT331 - Applied Linear Models (0.50)
    - STAT333 - Stochastic Processes 1 (0.50)
    - STAT341 - Computational Statistics and Data Analysis (0.50)
    -
    - Complete 1 of the following:
    - AMATH250 - Introduction to Differential Equations (0.50)
    - AMATH251 - Introduction to Differential Equations (Advanced Level) (0.50)
    - AMATH350 - Differential Equations for Business and Economics (0.50)

-
- Complete 1 of the following:
- MATH237 - Calculus 3 for Honours Mathematics (0.50)
- MATH247 - Calculus 3 (Advanced Level) (0.50)
-
- Complete 2 additional ACTSC courses at the 400-level
- Complete 1 additional course at the 300- or 400-level from: ACTSC, AMATH, CO, CS, MATBUS, MATH, PMATH, STAT
- Complete all of the following
- Complete 2 additional courses from any ACTSC course at the 300- or 400-level or from the courses listed below:
- Choose any of the following:
- AFM424 - Equity Investments (0.50)
- STAT431 - Generalized Linear Models and their Applications (0.50)
- STAT433 - Stochastic Processes 2 (0.50)
- **STAT440 - Computational Inference (0.50)**
- STAT441 - Statistical Learning - Classification (0.50)
- STAT443 - Forecasting (0.50)
- **STAT444 - Statistical Learning - Advanced Regression (0.50)**
- ~~STAT340 - Stochastic Simulation Methods (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Students currently or previously enrolled in the Business Administration and Mathematics double degree academic plan may substitute:
    1. BUS121W for MTHEL131.
    2. BUS127W for AFM101.
    3. BUS362W for ENGL378.
    4. BUS393W for ACTSC372.
    5. BUS473W for AFM424.

6. ECON120W for ECON101.
7. ECON140W for ECON102.

2. Students currently or previously enrolled in the following academic plans (Business Administration and Mathematics double degree, Mathematics/Business Administration, Mathematics/Financial Analysis and Risk Management, Information Technology Management, and Mathematical Optimization – Business Specialization) may substitute:
    1. STAT371 for STAT331.
3. List of not acceptable substitutions:
    1. STAT334 is not an acceptable substitute for STAT330 or STAT333.
    2. STAT373 is not an acceptable substitute for STAT331.
    3. STAT374 is not an acceptable substitute for STAT331.
4. Students previously enrolled in the Mathematics/Chartered Professional Accountancy academic plan may substitute: ECON100/COMM103 for ECON101.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one of two available specializations.

Specializations List

ACTSC-Finance Specialization, or ACTSC-Predictive Analytics Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

ACTSC-Finance Specialization - Finance Specialization

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-27

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?

No,

Is the credential name changing?

No,

Co-operative System of Study and Requirements

Not Applicable,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

The content of AFM 102 is not closely relevant to modern quantitative finance. The removal of AFM 102 from the requirements creates better alignment with the degree requirement of the updated PA specialization in terms of course workload and difficulty level.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations (Departmental)

Darren Charters, Deputy Director of Student Engagement from School of Accounting and Finance, was consulted on Sep. 1, 2025. SAF has no concerns with this change, as the impact on AFM 102 enrollment is minimal.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Statistics and Actuarial Science

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Specialization

Program/Plan Name

Finance Specialization

Admissions

Specialization is available for students in the following majors

H-Actuarial Science

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
Yes,

List of Invalid Combinations

Mathematical Finance (Bachelor of Mathematics - Honours)

Average Requirement

No,

Graduation Requirements

- Complete a total of 3.0 units.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete all of the following
    - Complete all the following:
    - ACTSC445 - Quantitative Enterprise Risk Management (0.50)
    - STAT340 - Stochastic Simulation Methods (0.50)
    -
    - Complete 1 of the following:
    - ACTSC423 - Topics in Financial Econometrics (0.50)
    - AFM423 - Topics in Financial Econometrics (0.50)
    - AFM424 - Equity Investments (0.50)
    -
    - Complete 1 of the following:
    - ACTSC447 - Numerical Computation for Financial Modelling (0.50)
    - CS476 - Numerical Computation for Financial Modelling (0.50)
    -
    - Complete 1 of the following:
    - AMATH242 - Introduction to Computational Mathematics (0.50)
    - CS370 - Numerical Computation (0.50)
    - CS371 - Introduction to Computational Mathematics (0.50)
    - ~~AFM102 - Introduction to Managerial Accounting (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Students currently or previously enrolled in the Business Administration and Mathematics double degree academic plan may substitute:
    1. BUS247W for AFM102.
    2. BUS473W for AFM424.

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

ACTSC-Predictive Analytics Specialization - Predictive Analytics Specialization

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-27

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?

No,

Co-operative System of Study and Requirements

Not Applicable,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

The creation of ACTSC 456 provides the opportunity to update the Predictive Analytics (PA) Specialization to incorporate this keystone PA course in the requirements, realign the overall content with the most relevant topics in current practice, and make it more attractive to students.

In consultation with multiple actuarial practitioners in the PA space, it was identified that of the current STAT 4XXs required in the PA specialization and those not currently required, STAT 440, 431, 441, 444 cover the most critical topics needed for PA practice. STAT 442 and STAT 443 were considered less critical, while CS 330 and STAT437 were deemed to have little relevance.

Accordingly, CS 330 and STAT 437 are removed from the list of required courses. STAT 440 is elevated to a mandatory course due to its core relevance. STAT 443 is moved to “complete 1 of the list” because of its comparatively lower relevance. With ACTSC 456 required, STAT 441 is removed due to being an anti-requisite. STAT 444 is also moved to "complete 1 of the list”, as some of its content overlaps with ACTSC 456, however, still offers students the opportunity to explore the

material from a broader and potentially deeper perspective. Since ACTSC 454 and ACTSC 457 cover predictive analytics in life insurance and non-life insurance, respectively, we group them to form a “Complete 1 of the following” option.

Approved at UAC 20250929.

Approved at FC 20251028.

Consultations (Departmental)

Ondrej Lhotak and Mike Godfrey, Director of Undergraduate Studies in the Cheriton School of Computer Science, were consulted (2025-08-29). CS has no concerns regarding the removal of CS 330 from the degree requirement of the Predictive Analytics Specialization, as the impact on CS 330 enrollment is minimal.

General Program/Plan Information

Faculty

Faculty of Mathematics

Academic Unit

Department of Statistics and Actuarial Science

Faculty

Faculty of Mathematics

Undergraduate Credential Type

Specialization

Program/Plan Name

Predictive Analytics Specialization

Admissions

Specialization is available for students in the following majors

H-Actuarial Science

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
No,

Proposed

Graduation Requirements

- Complete a total of 2.5 units.

Existing

Graduation Requirements

- Complete a total of 3.5 units.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    -
    - Complete all of the following
    - Complete all the following:

- **Course Not Found**
- STAT431 - Generalized Linear Models and their Applications (0.50)
- STAT440 - Computational Inference (0.50)
-
- Complete 1 of the following:
- ACTSC454 - Longevity and Mortality Using Predictive Analytics (0.50)
- **Course Not Found**
-
- Complete 1 of the following:
- STAT442 - Data Visualization (0.50)
- STAT443 - Forecasting (0.50)
- **STAT444 - Statistical Learning - Advanced Regression (0.50)**
- ~~CS330 - Management Information Systems (0.50)~~
- ~~STAT341 - Computational Statistics and Data Analysis (0.50)~~
- ~~STAT441 - Statistical Learning - Classification (0.50)~~
- ~~STAT437 - Statistical Methods for Life History Analysis (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

No,

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path	Faculty/AFIW Path(s) for Workflow

Committee approvals, Faculty of Mathematics

Dependencies

[redacted]

Date 2025/11/26

Show Empty Fields

Meeting Information

Agenda Page Title
SUC - 2025-12 - Consent Agenda - Faculty of Science

Career Level
Undergraduate,

Faculty/Unit
Science

Date
2025-11-11

Time

Location

Summary

BIOLOGY

The Department of Biology submits the following for 2026:

- One course inactivation: BIOL 452 (continued low enrolment)
- One new course: BIOL 400 (special topics)
- One course change: BIOL 235 (new prerequisite- BIOL 130L)

CHEMISTRY

The Department of Chemistry submits the following for approval in 2026:

- One course change: CHEM 481 (title, description and prerequisite change- for wider range of topics)

Earth and Environmental Sciences (EES)

The Department of Earth and Environmental Sciences submits the following for approval:

- One course inactivation: EARTH 460 (low enrolment)
- One course change: EARTH 490 (grading basis change to numeric)
- One minor plan change:
  - H-Earth Sciences, Geophysics Specialization plans- to remove EARTH 460

Other Business

Course Proposals

Course Proposal Details

Retire

BIOL 452

EARTH 460

New

BIOL 400

Changes

BIOL 235

CHEM 481

EARTH 490

Courses: Retire

Code	Title	Type	Workflow Step
BIOL 452	Quantitative Fisheries Biology	Courses	SUC Subcommittee, SUC Curricular Subcommittee
EARTH 460	Geophysical Data Analysis	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Courses: New

Code	Title	Type	Workflow Step
BIOL 400	Special Topics in Biology	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Courses: Changes

Code	Title	Type	Workflow Step
BIOL 235	Foundations of Molecular Biology	Courses	SUC Subcommittee, SUC Curricular Subcommittee
CHEM 481	Biomolecular Modelling: Principles, Practices, and Applications in Drug Design	Courses	SUC Subcommittee, SUC Curricular Subcommittee
EARTH 490	Field Course	Courses	SUC Subcommittee, SUC Curricular Subcommittee

Programs & Plans Proposals

Programs & Plans Proposal Details

1. Earth Sciences, Geophysics Specialization

Programs & Plans: Retire
No proposals have been added.

Programs & Plans: Major Modifications
No proposals have been added.

Programs & Plans: Minor Modifications

Code	Title	Type	Workflow Step
H-Earth Sciences - Geophysics Specialization	Earth Sciences - Geophysics Specialization (Bachelor of Science - Honours)	Programs	SUC Subcommittee, SUC Curricular Subcommittee

Regulations Proposals

Regulations Proposal Details

Regulations: Retire
No proposals have been added.

Regulations: New
No proposals have been added.

Regulations: Changes
No proposals have been added.

BIOL 452 - Quantitative Fisheries Biology

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Retire,

Academic Unit Approval
2025-01-28

Last Offering of Course
Fall 2023

Retired Impact
No,

Rationale for Change

BIOL 452 will be retired September 1, 2026, based on continued low enrollment and in efforts to meet recommendations from Biology Department Cyclical Program Review to reduce our courses on offer.

BIOL 452 – Quantitative Fisheries Biology (LEC) Enrolment Numbers:

- F24: not offered
- F23: 5/25
- F22: 5/25
- F21: 9/25
- F20: not offered
- F19: 11/16

The course is listed in the Environmental Sciences, Ecology plans as a "pick one of", and in the Ecology and Environmental Biology Option in a "pick two of" what is a very extensive list approved courses. Therefore, these plans will not be impacted by the retirement of this one course.

Course Information

Faculty
Faculty of Science

Academic Unit
Department of Biology

Subject Code
BIOL

Number
452

Course Level
400

Title

Quantitative Fisheries Biology

Abbreviated Title
Quantitative Fisheries Biol

Undergraduate Communication Requirement Identifier
No,

Description
The practices of fisheries science including the effects of industrial fisheries on fish stocks; methods of capture, obtaining, using, and interpretation of vital statistics of fish stocks; population estimation; stock-recruitment; growth; mortality; and fecundity. Emphasis is placed on the use of statistical information for making ecological inferences about the status of fish populations.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - STAT202 - Introductory Statistics for Scientists (0.50)
- Must have completed at least 1 of the following:
  - BIOL150 - Organismal and Evolutionary Ecology (0.50)
  - BIOL251 - Fundamentals of Ecology (0.50)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Science

Dependencies

Course Requirements (units)

- Ecology & Environmental Biology Option - Ecology and Environmental Biology Option
- H-Environmental Sciences - Ecology Specialization - Environmental Sciences - Ecology Specialization (Bachelor of Science - Honours) View Program View Program

EARTH 460 - Geophysical Data Analysis

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Retire,

Academic Unit Approval
2025-02-07

Last Offering of Course
Winter 2023

Retired Impact
Yes,

Retired Impact Details
This course has not been offered since Winter 2023. Students in the Geophysics specialization have all been told that they can replace this requirement with a 300/400 level Earth elective.

Rationale for Change

EARTH 460 has had low enrolment for many years, and as a result, the course will retire effective Sept. 1, 2026.

This is a required course for the Earth Sciences, Geophysics Specialization plans, but students in these plans also take another fourth year course, EARTH 461 that fulfils the necessary knowledge requirement for the Geophysics specialization, and therefore, won't be impacted by the retirement of EARTH 460.

Consultations

EARTH 460 is a core requirement for Earth Sciences, Geophysics Specialization, which will be replaced with an EARTH elective effective 2026.

EARTH 460 appears in a "one of list" within Geological Engineering major as well as the Hydrogeology Specialization for this major. Engineering has been made aware of the retirement (email sent to S. Yin April 4; acknowledged April 7, 2025).

EARTH 460 also appears in a "one of list" for the Physical Sciences Option (Bachelor of Applied Science and Bachelor of Software Engineering). Engineering has been made aware of the retirement (email sent to S. Yin April 4; acknowledged April 7, 2025).

Course Information

Faculty

Faculty of Science

Academic Unit

Department of Earth and Environmental Sciences

Subject Code
EARTH

Number
460

Course Level
400

Title
Geophysical Data Analysis

Abbreviated Title
Geophysical Data Analysis

Undergraduate Communication Requirement Identifier
No,

Description

Geophysical data sets require the application of specialized analysis methods to extract information about the Earth's interior. This course covers commonly used concepts and techniques used in geophysical data analysis including spectral analysis, convolution, filtering, and sampling. Emphasis is given to the analysis and processing of radar and seismic reflection profiling data sets.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Must have completed the following:

- EARTH260 - Introductory Applied Geophysics (0.50)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Science

Dependencies

Course Requirements (no units)

- Hydrogeology Specialization - Hydrogeology Specialization View Program
- Physical Sciences Option - Physical Sciences Option View Program
- H-Earth Sciences - Geophysics Specialization - Earth Sciences - Geophysics Specialization (Bachelor of Science - Honours) View Program

Course Lists

- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) View Program

Top

BIOL 400 - Special Topics in Biology

Effective Date & Career

Career
Undergraduate,

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
New,

Academic Unit Approval
2025-01-28

Rationale for New Course

A lecture-only course listing to allow for flexibility in the Department's ability to offer newly proposed courses. This also addresses the Cyclical Program Review comments of an excess in the number of upper-year courses currently in the calendar as a number of our current highly specialized 400-level courses could easily be repackaged as a Special Topics offering and removed from the calendar. Special topics courses will still follow the standard procedure of approval by the Department and would be subject to the same requirements for minimum enrolment benchmarks in order to be offered. While the requirement listed for this topics course is general, each specific topic of BIOL 400 would be listed on the Biology website with specific pre-requisites, similar to what is listed for CHEM 400 (https://uwaterloo.ca/chemistry/undergraduate-studies/program-electives).

Students would be permitted to enroll in more than one BIOL 400 offering in the same term, and program changes will follow to stipulate how many BIOL 400 credits may be taken (if multiple are available).

Course Information

Faculty
Faculty of Science

Academic Unit
Department of Biology

Subject Code **Number** **Course Level**

BIOL	400	400

Title
Special Topics in Biology

Abbreviated Title
Special Topics

Undergraduate Communication Requirement Identifier
No,

Description
Advanced topics in the various subdisciplines of biology. Topics offered will vary in accordance with the availability of the instructor.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?	Total Completions Allowed	Allow Multiple Enrol in a Term
	10	

Yes,

Yes,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Students must be in level 3B or higher
- Enrolled in H-Biology, H-Biochemistry, H-Biochemistry - Biotechnology Specialization, H-Biomedical Sciences, or H-Environmental Sciences - Ecology Specialization

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Science

Dependencies

There are no dependencies

BIOL 235 - Foundations of Molecular Biology

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-09-24

Rationale for Change

There is an embedded lab component in the 0.5 unit BIOL 235 courses. Adding BIOL 130L prerequisite to BIOL 235 will ensure that students are prepared to benefit from an intermediate laboratory experience without the need to duplicate the introductory activities of BIOL 130L.

All programs that require BIOL 235, have been or will be modified for Fall 2026 to include BIOL 130L.

Consultations

Discussion with Science and Business advisor for changes to programs for Sept, 1, 2026, to include BIOL 130L requirement have taken place (L. Balch, April 2025).

Knowledge Integration plans feature BIOL 235 in a "pick one of" list; awareness email sent (KI UG Advisor, KI UG Associate Chair, C. Knipe, April 14, 2025).

Pre-Clinic Specialization, which also listed BIOL 235 in a "pick one of" list, is no longer listed as a dependency for BIOL 235, but regardless, BIOL 130L is a requirement for health study students and therefore, the proposed change would not be an issue (D. Williams, D. Makowich, email April 9, 2025).

Course Information

Faculty

Faculty of Science

Academic Unit

Department of Biology

Subject Code

BIOL

Number

235

Course Level

200

Title

Foundations of Molecular Biology

Abbreviated Title

Molecular Biology Foundations

Undergraduate Communication Requirement Identifier

No,

Description

This course introduces fundamental approaches used to study the biomolecules that mediate cellular processes. Topics include the central dogma of molecular biology, the theoretical basis for molecular methods, scientific principles of hypothesis development, and experimental design in molecular biology research. The laboratory will cover essential experimental techniques for analyzing biomolecules (DNA, RNA, and protein).

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components
LaboratoryLecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Must have completed the following:
   - BIOL130 - Introductory Cell Biology (0.50)
   - **BIOL130L - Cell Biology Laboratory (0.25)**
   - BIOL239 - Genetics (0.50)

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in: BIOL309

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Science

Dependencies

Prerequisites

- BIOL 335L - Molecular Biology Techniques View Program
- BIOL 331 - Advanced Cell Biology View Program
- BIOL 342 - Molecular Biotechnology 1 View Program
- BIOL 434 - Human Molecular Genetics View Program
- BIOL 431 - Bacterial Molecular Genetics View Program
- BIOL 428 - Plant Molecular Genetics View Program
- BIOL 438 - Molecular Biology of Animal Development View Program

Course Requirements (units)

- Biotechnology Specialization - Biotechnology Specialization View Program

Course Requirements (no units)

- H-Biochemistry - Biochemistry (Bachelor of Science - Honours) View Program

Course Requirements (units)

- Cell and Molecular Biology Option - Cell and Molecular Biology Option View Program

- H-Biochemistry - Biotechnology Specialization - Biochemistry - Biotechnology Specialization (Bachelor of Science - Honours) View Program

Course Requirements (no units)
- Pre-Clinical Specialization - Pre-Clinical Specialization View Program

Course Requirements (units)
- H-Science & Business - Biotechnology Specialization - Science and Business - Biotechnology Specialization (Bachelor of Science - Honours) View Program
- H-Science & Business - Biochemistry Specialization - Science and Business - Biochemistry Specialization (Bachelor of Science - Honours) View Program

Course Lists
- H-Knowledge Integration - Knowledge Integration (Bachelor of Knowledge Integration - Honours) View Program

Course Requirements (units)
- H-Biotechnology/Chartered Professional Accountancy - Biotechnology/Chartered Professional Accountancy (Bachelor of Science - Honours) View Program

CHEM 481 - Biomolecular Modelling: Principles, Practices, and Applications in Drug Design

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-01-29

Rationale for Change

Currently, CHEM 481 has an average enrollment of approximately 15 students, most of whom are from the Medicinal Chemistry program. It is listed in a "pick one of" approved course list for both the Medicinal Chemistry and Chemistry plans. However, the course could also be useful for Biochemistry students, as it covers various techniques such as structure prediction, molecular docking, and molecular dynamics.

A proposed new title and updated description that more accurately reflects the course content is proposed, which should also be more appealing to more students from Biochemistry. In addition, the CHEM 340 pre-requisite is being removed, which is not necessary for this course, as CHEM 340 focuses on Gaussian calculations. This will make CHEM 481 accessible to students in Biochemistry, as they only require CHEM 140 but not CHEM 340.

Course Information

Faculty

Faculty of Science

Academic Unit

Department of Chemistry

Subject Code
CHEM

Number
481

Course Level
400

Proposed

Title
Biomolecular Modelling: Principles, Practices, and Applications in Drug Design

Existing

Title
Rational Design of Potential Drug Candidates

Proposed

Abbreviated Title
Biomolecular Modelling

Existing

Undergraduate Communication Requirement Identifier
No,

Abbreviated Title
Rational Drug Design

Proposed

Description
This course offers an in-depth exploration of molecular modelling techniques and their applications in biochemistry, drug discovery, and design. Students will gain hands-on experience with computational methods for biomolecular structure analysis, molecular recognition, and therapeutic candidate design. Key topics include three-dimensional structure visualization, protein structure prediction, molecular dynamics simulations, and computer-aided drug design strategies, covering structure-based, ligand-based, and fragment-based approaches. Practical sessions and real-world case studies will complement theoretical concepts, highlighting their importance in biochemical and pharmaceutical research and development.

Existing

Description
This course provides an introduction to strategies for design of potential drug candidates. It builds upon molecular modelling principles introduced in CHEM340 and will apply them to specific problems in drug design. Topics include conformational analysis, molecular mechanics, and molecular dynamics; computational studies of drug-receptor interactions, docking of small organic molecules to biological receptors, and alteration of molecular structures for improvement of bioactivity.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed the following:
   - CHEM360 - Organic Chemistry 3 (0.50)
   -
   - Must have completed at least 1 of the following:
   - CHEM233 - Fundamentals of Biochemistry (0.50)
   - CHEM237 - Introductory Biochemistry (0.50)
   - ~~CHEM340 - Introductory Computational Chemistry (0.50)~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Science

Dependencies

Course Lists
- H-Medicinal Chemistry - Medicinal Chemistry (Bachelor of Science - Honours) View Program

Course Requirements (no units)
- H-Chemistry - Chemistry (Bachelor of Science - Honours) View Program

EARTH 490 - Field Course

Top

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Rationale for Change

EARTH 490 is a field course that is best graded numerically but was set up as non-standard credit/no credit (CR/NCR grading). This proposed change to grading is supported by the department.

Course Information

Faculty

Faculty of Science

Academic Unit

Department of Earth and Environmental Sciences

Subject Code
EARTH

Number
490

Course Level
400

Title
Field Course

Abbreviated Title
Field Course

Undergraduate Communication Requirement Identifier
No,

Description
One or more trips that emphasize field observations. Specific trips may be organized to examine field aspects of any of the disciplines within earth sciences or geological engineering.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Field Studies

Primary Component
Field Studies

Grading Information

Proposed
Standard Course Grading Yes,
Existing
Standard Course Grading No,

Proposed
Standard Course Grading Yes,
Existing
Standard Course Grading No,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Students must be in level 3A or higher
- Enrolled in H-Earth Sciences - Geology Specialization, H-Earth Sciences - Geophysics Specialization, H-Earth Sciences - Hydrogeology, H-Environmental Sciences - Geoscience Specialization, or H-Geological Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Fee Statement
This course may have additional fees. See academic unit for details.

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Science

Dependencies

There are no dependencies

H-Earth Sciences - Geophysics Specialization - Earth Sciences - Geophysics Specialization (Bachelor of Science - Honours)

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-02-07

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Students in this specialization have been notified of the change via email.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Not Applicable,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

We are removing EARTH 460 as a requirement for this program and replacing that with an Earth elective. EARTH 460 has had low enrolment for many years. Students in the Geophysics specialization already have a 4th year course with EARTH 461 that fulfils the necessary knowledge requirement for the Geophysics specialization. This also gives students move flexibility in the upper years.

General Program/Plan Information

Faculty

Faculty of Science

Academic Unit

Department of Earth and Environmental Sciences

Faculty
Faculty of Science

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Science (Science)

Program/Plan Name
Earth Sciences - Geophysics Specialization (Bachelor of Science - Honours)

Systems of Study
Co-operative, Regular,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative Earth Sciences average of 60.0%.

Proposed

Graduation Requirements

- See Bachelor of Science degree-level requirements.

- Complete a total of 21.75 units:
  - 18.25 units of required courses, listed below.
  - 3.0 units of additional EARTH courses (see Additional Constraints).
  - 0.5 unit of elective lecture course.

Existing

Graduation Requirements

- See Bachelor of Science degree-level requirements.
- Complete a total of 21.75 units:
  - 18.75 units of required courses, listed below.
  - 2.5 units of additional EARTH courses (see Additional Constraints).
  - 0.5 unit of elective lecture course.

Co-operative Education Program Requirements

For students in the co-operative system of study, see Bachelor of Science co-operative education program requirements.

Course Requirements (units)

Required Courses

- oUnits to Complete
- No Rules

1. Required Courses
   -
   - Complete all of the following
   - Complete all the following:
   - CHEM120 - General Chemistry 1 (0.50)
   - CHEM120L - General Chemistry Laboratory 1 (0.25)
   - CHEM123 - General Chemistry 2 (0.50)
   - CHEM123L - General Chemistry Laboratory 2 (0.25)
   - EARTH121 - Introductory Earth Sciences (0.50)
   - EARTH121L - Introductory Earth Sciences Laboratory (0.25)
   - EARTH122 - Introductory Environmental Sciences (0.50)
   - EARTH122L - Introductory Environmental Sciences Laboratory (0.25)
   - EARTH123 - Introductory Hydrology (0.50)
   - EARTH221 - Introductory Geochemistry (0.50)
   - EARTH223 - Field Methods in Hydrology (0.50)
   - EARTH231 - Mineralogy (0.50)
   - EARTH232 - Introductory Petrography (0.50)
   - EARTH235 - Stratigraphic Approaches to Understanding Earth's History (0.50)
   - EARTH238 - Introductory Structural Geology (0.50)
   - EARTH260 - Introductory Applied Geophysics (0.50)
   - EARTH333 - Introductory Sedimentology (0.50)
   - EARTH355 - Water: Data to Decisions (0.50)
   - EARTH390 - Methods in Geological Mapping (0.50)
   - EARTH436A - Thesis Proposal (0.50)
   - EARTH458 - Physical Hydrogeology (0.50)
   - EARTH458L - Field Methods in Hydrogeology (0.25)
   - EARTH461 - Near-Surface Geophysics (0.50)

- EARTH471 - Mineral Deposits (0.50)
- MATH127 - Calculus 1 for the Sciences (0.50)
- MATH128 - Calculus 2 for the Sciences (0.50)
- STAT202 - Introductory Statistics for Scientists (0.50)
-
- Complete 1 of the following:
- CIVE221 - Advanced Calculus (0.50)
- GEOE221 - Advanced Calculus (0.50)
- MATH227 - Calculus 3 for Honours Physics (0.50)
-
- Complete 1 of the following:
- CIVE222 - Differential Equations (0.50)
- ENVE223 - Differential Equations and Balance Laws (0.50)
- GEOE223 - Differential Equations and Balance Laws (0.50)
- MATH228 - Differential Equations for Physics and Chemistry (0.50)
-
- Complete 1 of the following:
- COMMST193 - Communication in the Sciences (0.50)
- ENGL193 - Communication in the Sciences (0.50)
-
- Complete 1 of the following:
- MATH106 - Applied Linear Algebra 1 (0.50)
- MATH114 - Linear Algebra for Science (0.50)
-
- Complete 1 of the following
- Complete all the following:
- EARTH436B - Honours Thesis (0.50)
-
- Complete 1 additional EARTH course at the 300-level or above
-
- Complete 1 of the following
- Complete all the following:
- PHYS111 - Physics 1 (0.50)
- PHYS111L - Physics 1 Laboratory (0.25)
-
- Complete all the following:
- PHYS121 - Mechanics (0.50)
- PHYS121L - Mechanics Laboratory (0.25)
-
- Complete 1 of the following
- Complete all the following:
- PHYS112 - Physics 2 (0.50)
- PHYS112L - Physics 2 Laboratory (0.25)
-
- Complete all the following:
- PHYS122 - Waves, Electricity and Magnetism (0.50)
- PHYS122L - Waves, Electricity and Magnetism Laboratory (0.25)
-
- Complete 3 additional courses from the following subject codes: AMATH, BIOL, CHEM, CS, MATH, MNS, PHYS, STAT
- Complete 1 additional course from the following subject codes: BIOL, CHEM, CS, PHYS, STAT
- The following cannot be used towards this academic plan:
- CS100 - Introduction to Computing Through Applications (0.50)
- MATH103 - Introductory Algebra for Arts and Social Science (0.50)
- MATH104 - Introductory Calculus for Arts and Social Science (0.50)
- MATH124 - Calculus and Vector Algebra for Kinesiology (0.50)
- MATH199 - Mathematical Discovery and Invention (0.50)
- ~~EARTH460 - Geophysical Data Analysis (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. Students may only complete one course from any cross-listed set.
2. 0.5 unit must be additional EARTH courses at the 200-level or above.
3. 2.5 units must be additional EARTH courses at the 300-level or above.
4. Students will need enrolment permission for required courses offered through the Faculty of Engineering.
5. No one course may fulfil more than one requirement within this major.

Existing

Additional Constraints

1. Students may only complete one course from any cross-listed set.
2. 0.5 unit must be additional EARTH courses at the 200-level or above.
3. 2.0 units must be additional EARTH courses at the 300-level or above.
4. Students will need enrolment permission for required courses offered through the Faculty of Engineering.
5. No one course may fulfil more than one requirement within this major.

Notes

- See list of academic advisors.
- See Faculty of Science for recommended course sequences.

Specializations

Specializations for this Major
No,

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow
Faculty of Science

Dependencies

[redacted]

Accessible Education Project – Senate Undergraduate Council – December 9, 2025

Accessible Education Project Update

Over the past two years, teams of faculty and staff at the University of Waterloo have worked collaboratively to advance a comprehensive, cross-Faculty, institution-wide approach to accessible education. The Accessible Education project in the Teaching Innovation Incubator had been tasked with addressing 26 of the 185 AODA PSE recommendations. Three project teams were created to advance this work in three distinct areas:

- Policy & Guidelines
- Instructional Programs & Practices
- Learning Tools & Materials

This project's overarching goal has been to foster a teaching and learning environment in which innovative, inclusive, and accessible teaching practices are valued, supported, and continually improved.

Major accomplishments of the Accessible Education project include:

- Student Academic Disability Accommodation Policy (wrapping up end of 2025; **focus of discussion today**)
- Waterloo Practices for Accessible Teaching and Helpful/Holistic Strategies (WatPATHS) resource (completed)
- Accessible Teaching website (integrating WatPATHS resource) (completed)
- Summarized action items designated for ASUs to address (completed; shared with respective ASUs, and being built into long-term recommendations for this work)
- Working definitions and processes to guide programs and instructors through identifying Essential Requirements for a given academic program (process being refined for pilot purposes; **focus of discussion today**)
- Development and hosting of Accessible Education Day (2024 & 2025)
- Integrated Accessibility Retreat – one-day retreat for instructors to work on accessibility in their courses (2024 & 2025)

Concurrently, an open-access Postsecondary Course Accessibility Guide was developed by Christine Zaza (Centre for Extended Learning). The Guide includes 39 accessibility practices within six sections (e.g., course outline; course organization; course materials) and can be used by instructors to review and improve accessibility in their teaching. Research was conducted on which course accessibility practices students, as indicated in the guide, were considered most important for their learning (n = 1758). Undergraduate (81%) and graduate students (19%) from all six Faculties participated. Of the 39 accessibility practices, all had a mean rating of at least *somewhat important*, with 90% rated as either *very important* or *extremely important* by at least half of participants. Students found **well-organized**, **user-friendly courses**, **having information in advance**, and **good communication practices and options** as the most important. These data are the foundation for the Accessible Teaching website and its recommendations to instructors to make feasible and effective change in their teaching practices.

Next Steps

The Accessible Education project will officially wrap up in early 2026. A final report with specific recommendations and resource needs for ongoing support, including the establishment of advisory governance structures, will be prepared and shared.

UNIVERSITY OF WATERLOO
MEMORANDUM

TO: SUC

FROM: Members of the Policy & Guideline Committee (a subcommittee of the Accessible Education Project)

RE: New G Class Policy – Student Academic Disability Accommodations Policy

DATE: December 9, 2025

The new policy and related procedures describe and implement the University's commitments and obligations under the *Ontario Human Rights Code* and will be the University's primary instruments outlining the roles, processes, and responsibilities for providing academic accommodations to students with disabilities.

This memo provides an update on the progress made, the Fall 2025 consultative pathway, and appends the draft of the policy.

BACKGROUND

Student Accommodation Guidelines

The Student Accommodation Guidelines ("Guidelines") were implemented in 2019 and have historically been relied upon by the University community to establish student academic accommodation plans, articulate the roles and responsibilities of our community members in the accommodation process, resolve accommodation disputes, and consider requests for retroactive accommodations. These Guidelines refer to and implement requirements under the *Code* as well as best practice guidance from the Ontario Human Rights Commission Policy on Accessible Education for Students with Disabilities.

While the Guidelines have been relied upon by the community, the intention was for these Guidelines to eventually evolve into a formal policy. While situated as "guidelines," the content includes requirements that operationalize the University's duty to accommodate under the *Ontario Human Rights Code* as well as a wide range of responsibilities, including those for students, AccessAbility Services, and course instructors. The content of these guidelines is appropriately at the level of university policy.

Much of the new policy leverages content, including responsibilities, from the existing Guidelines. When these guidelines were created in 2019, the following bodies were consulted:

- Deans' Council
- Executive Council
- Undergraduate Operations Committee
- Graduate Operations Committee
- Undergraduate Student Relations Committee
- Graduate Student Relations Committee
- Faculty Relations Committee
- Committee on Student Mental Health

- FAUW Equity Committee
- Legal and Immigration Services
- Secretariat
- Co-operative Education

Ontario Government – Proposed Recommendations

In 2021, the Ontario government released a report prepared by their Postsecondary Education Standards Development Committee. This Committee defined the long-term objective of the proposed Postsecondary Education Standards under the *Accessibility for Ontarians with Disabilities Act*, and various measures, policies, practices, and requirements recommended for implementation. While these recommendations have not yet become formal legal requirements, many refer to existing legal requirements and nonetheless translate into good practice. The hope was that postsecondary institutions would begin making changes before the enactment of any forthcoming regulation.

Accessible Education Project

The Accessible Education one part of the University's Disability Inclusion project (generally known as DISCo), which aimed to create a university culture in which to the greatest extent that is feasible accessibility becomes "standard operating procedure" at Waterloo. DISCo has the goal of positioning the University to respond appropriately to all 185 of the *AODA* recommendations.

A Policy and Guidelines Working Group ("Working Group") is one of three working groups that comprise the Accessible Education Project. Its mandate was to transition the Guidelines into a formal G-Class policy. In creating a draft of this policy, this Group has turned its attention not only to strengthening the existing Guidelines but also a number of these *AODA* recommendations. The intent has been to satisfy the spirit of the recommendations and use language that is clear and readily interpreted.

SCOPE

The new policy and procedures apply to academic accommodations for students (undergraduate and graduate) with disabilities. Academic accommodations are modifications or adjustments to the way that a student with a disability accesses and fully participates in their academics.

The policy scope is narrower than the original intent, which would have covered accommodations for all protected grounds under the *Ontario Human Rights Code*. It was ultimately decided that a policy for accommodating students with disabilities was ready and important to move forward at this time.

As with the existing Student Accommodation Guidelines, the new policy and procedures outline roles and responsibilities of groups involved in the accommodation process, including students, Course Instructors and Graduate Student Supervisors (which includes faculty, staff instructors), Chairs and Directors, AccessAbility Services, and the University.

The draft policy includes procedures for: establishing academic accommodations; dispute resolution; and retroactive accommodations. Additional guidelines covering topics such as referrals, timely accommodations, safeguarding confidentiality, and essential requirements as they relate to accommodations have been and will be developed by AccessAbility Services.

The draft policy was drafted in alignment with statutory obligations under the *Ontario Human Rights Code* and the *Accessibility for Ontarians with Disabilities Act*. Policy 58 – Accessibility – remains the university's accessibility policy to give effect to multiple *AODA* requirements.

The draft policy leverages the existing Student Accommodation Guidelines, the Ontario Human Rights Commission's Policy on Accessible Education for Students with Disabilities, and the Final Recommendations from the Postsecondary Education Standards Development Committee.

DRAFTING PROCESS

The draft policy and procedures are the result of careful consideration of a Working Group based on their subject matter expertise and experiences with the existing Student Accommodation Guidelines. This draft has also received and implemented feedback from campus experts and a consultative policy drafting committee as outlined below.

The Working Group included:

- Associate Vice-President, Academic (Co-lead, Policy and Guidelines Project Team, Policy Working Group)
- Associate Provost, Campus Support and Accessibility (Co-lead, Policy Working Group)
- An Associate Dean, Undergraduate Studies
- A Representative from the Library
- Associate Registrar (Co- lead, Policy and Guidelines Project Team)
- Director, Student Decision and Policy Support
- Associate University Secretary, Policy and Special Projects
- A Faculty member
- Director, AccessAbility Services

Out of the Working Group, a smaller policy working group was charged with updating the drafts following all consultations. The mandate was to draft a policy that:

- adapted the Student Accommodation Guidelines for consistency with other University Policies
- was informed by the recommendations to the Ontario government related to the development of proposed postsecondary education accessibility standards
- ensured the University meets legal requirements related to accommodations for students
- strengthened the existing Student Accommodation Guidelines by identifying and filling gaps in practice and recommending other improvements

The draft has also received reviews and incorporated feedback from:

- LIS (January 2025; August 2025)
- Office of the Ombudsperson (April 2025)
- A Policy Drafting Committee (April-May 2025). A committee made up of campus experts for comment and feedback, approved by the President. A graduate and an undergraduate student were invited to be on this committee. The committee was asked to review the draft and make recommendations for improvement prior to wider consultation. The same committee will be asked to review and approve post-consultation edits
- ADU Group (June 2025)

FURTHER CONSULTATIONS

Wider consultations and presentations to be undertaken by the Working Group will include

- PVP+
- Deans' Council +
- Undergraduate Student Relations Committee
- Graduate Student Relations Committee
- Senate Undergraduate Council
- Senate Graduate Council
- Faculty Relations Committee
- Staff Relations Committee
- Council of Academic Leaders

Additionally, the Working Group will send the draft policy for feedback from the following campus groups:

- The Centre for Extended Learning
- The Centre for Teaching Excellence
- The Library
- Co-operative Education
- Conflict Management Office
- Graduate Studies and Postdoctoral Affairs
- Office of Equity, Diversity, Inclusion an Anti-Racism
- Office of Indigenous Relations
- Registrar's Office
- Plant Operations
- Space Planning/teaching and Learning Spaces Committee
- WUSA
- GSA

APPROVAL AND GOVERNANCE

- President (approval, recommend to Senate)
- Senate (approval, recommend to Board of Governors)
- Community & Culture Committee (information and discussion)
- Board of Governors, aiming for February 2026 (final approval)

APPENDED

- Draft Policy and Procedures

Student Academic Disability Accommodations Policy. Version 5 10.2025

The policies found on the website of the Secretariat are compulsory rules for the University community. The authoritative copies of the policies are held by the Secretariat and bear the seal of the University. The online version accessible through the website of the Secretariat is available for information purposes only. In case of discrepancy between the online version and the authoritative copy held by the Secretariat, the authoritative copy shall prevail. Please contact the Secretariat for assistance if necessary.

Established:	[Insert date of final approval in accordance with Policy 1.]
Revised:	N/A.
Mandatory Review Date:	[If a new policy, insert the second anniversary of the establishment date. If revised, insert the fifth anniversary after the date when last revised.]
Supersedes:	Student Academic Accommodation Guidelines
Class:	G
Responsible/Originating Departments:	Associate Vice-President, Academic Associate Provost, Campus Support and Accessibility
Executive Contact:	TBD

Related Policies, Guidelines and Procedures:

- AccessAbility Services Guidelines
- Policy 46 – Information Management
- Managing Student Information for Faculties, Academic Departments and Schools
- Policy 33 – Ethical Behaviour
- Policy 58 – Accessibility
- Policy 70 – Student Petitions and Grievances

---

1. Introduction

1.1 The University of Waterloo is committed to the good health and well-being of its Students, to creating a supportive environment for learning and discovery, and to building community where all members are treated in a fair and equitable manner.

1.2 The University recognizes an ongoing commitment to values of inclusivity, diversity, equity, and accessibility as important contributions to its teaching and research missions.

1.3 The University recognizes that the Ontario *Human Rights Code* (the "*Code*") guarantees the right to equal treatment in education, without discrimination, and its obligations to take substantial and

meaningful measures to promote inclusiveness and equal participation for students on grounds established by the *Code.*

1.4 Aligned with its commitments, and its obligations under the *s Code*, including the duty to inquire, the University provides academic accommodations to Students with Disabilities who are require accommodations in order to meaningfully access their education at the University, as described in this policy.

1.5 Within the context of this policy academic accommodations are modifications or adjustments to the way that an otherwise qualified Student with a Disability accesses and fully participates in their academics. These address the way a Student receives course curriculum and materials, participates in course activities, or demonstrates mastery of course content and skill.

1.6 Academic accommodations do not alter the essential requirements of a program or course. Appropriate academic accommodations provide enable Students the opportunity to meet the essential requirements of the course or program, with no alteration in standards or outcomes, although the manner in which the student demonstrates proficiency, knowledge and skills may be altered.

1.7 The University will provide meaningful support in this context, carefully considering individual circumstances and institutional responsibilities. This includes the responsibility to accommodate students up to the point of undue hardship, which is the legal outer limit of the duty to accommodate, and which is considered individually within the full context of a request for academic accommodation.

1.8 The University recognizes that Students' identities can intersect and is committed to an intersectional approach to addressing multiple grounds of discrimination and a process that is considerate of a Student's identities.

1.9 In recognition of the University's commitments and obligations, this policy describes the roles and responsibilities of various University community members in the academic accommodation process, and outlines specific procedures for:

- implementing academic accommodations, including Interim Accommodations (see section 7.4)
- resolving disputes related to academic accommodations (see section 7.5)
- seeking Retroactive Accommodation (see section 7.7)

2. Scope

2.1 This policy applies to Students as defined in the policy. This policy does not apply to Students in their capacity as employees of the University, for which there is a separate employee accommodation process managed by the Office of Employee Health and Accommodations.

2.2 Employees involved in the provision of academic accommodations to Students are subject to responsibilities outlined in the policy. Specific roles and responsibilities are articulated in this policy for Course Instructors and Graduate Student Supervisors, AccessAbility Services, and Academic Administrators.

2.3 The policy's scope is academic accommodation of the needs of Students on the protected ground of Disability. The academic calendars (for undergraduate studies and for graduate studies) outline accommodations processes more generally and for other *Code*-protected grounds.

2.4 External entities and third parties providing goods, services, or facilities to Students have their own responsibilities to provide accommodations under the *Ontario Human Rights Code,* separate from this policy.

3. Legal Framework

3.1 In addition to the abovementioned "Related Policies, Guidelines & Procedures", the policy must be construed in accordance with the following legal provisions:

- *Ontario Human Rights Code*, R.S.O. 1990, c. H.19
- *Personal Health Information Protection Act*, 2004, S.O. 2004, c. 3, Sched. A
- *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31

A reference to legislation includes the regulations made thereunder.

3.2 If any of these legal provisions are modified, abrogated, superseded, or added to, the policy shall be interpreted in accordance with this new legal framework.

4. Purpose

The purposes of this policy are:

4.1 To describe and implement the University's duty to accommodate, up to the point of undue hardship, for Students with Disabilities.

4.2 To support the development of practices and procedures that enable equitable and inclusive academic opportunities for Students at the University.

4.3 To outline roles and responsibilities in the accommodation process for those who have responsibility in the academic accommodation process for Students.

4.4 To contribute to a culture around academic accommodations and the accommodation process that fosters a climate of understanding, dignity, and confidentiality.

5. Principles

The University is committed to respecting the diversity of its Students and to a collaborative accommodation process. The duty to accommodate is informed by key principles.

5.1 **Respect for dignity:** means respecting the dignity of the Student and promoting respect, encompassing the Student's self-worth, autonomy, and empowerment.

5.2 **Individualization:** means considering the unique identities and needs of each Student. Individualization recognizes that academic accommodations may need to be revisited over time to respond to changes in a Student's needs.

5.3 **Integration and full participation:** means removing existing barriers and providing accommodations where barriers continue to exist. This means taking steps to develop and implement accommodations with a view to maximizing a Student's full participation.

6. Roles and Responsibilities

6.1. University

6.1.1. The University shall inform incoming and current Students, as early as possible and in a readily accessible and understandable way, of the accommodations and supports available to Students with known or suspected disabilities.

6.1.2. The University shall provide academic accommodations for Students, up to the point of undue hardship, in accordance with the *Ontario Human Rights Code* and other applicable legislation, as well as in accordance with any University policies and procedures.

6.1.3. To support the requirements of the duty to accommodate, University employees with obligations under this policy are expected to work collaboratively with other parties as required and necessary to facilitate the accommodation.

6.1.4. The University shall consider all requests for Retroactive Accommodations, on a case-by-case basis.

6.1.5. The University recognizes its duty to inquire, which means proactively identifying Students who are perceived to have a Disability by inquiring as to whether the Student is aware of the available accommodation support and offering a meaningful opportunity for the Student to request an academic accommodation. The duty is triggered where the University is aware, or reasonably ought to be aware, that there may be a relationship between a Disability and a Student's behavior or academic performance.

6.1.6. All individuals involved in the accommodation process and or implementing accommodations must protect and maintain Students' privacy and confidentiality. All accommodation information must only be shared on a need-to-know basis. Personal health information must be collected, shared, disclosed, and stored in manner that is consistent with privacy legislation, Policy 46 – Information Management, and the Guidelines for the Protection of Personal Health Information. Only AccessAbility Services may request, accept, or review information related to a Student's medical or personal health. Employees other than AccessAbility Services who receive private medical information or documentation from a Student should securely dispose of it, or redirect it, in accordance with AccessAbility Services guidelines.

6.2. AccessAbility Services

6.2.1. AccessAbility Services is the University's centralized office for:

- Receiving and facilitating all applications from Students for academic accommodations.
- Receiving and facilitating any referrals from employees for Students with known or suspected Disabilities

- Receiving and assessing supporting medical documentation to determine accommodation needs.
- Designing, and revising when needed, Accommodation Plans in collaboration with the Student, the Course Instructor or Graduate Student Supervisor or Academic Administrators, for individual course academic accommodations or program-level academic accommodations as the case may be.
- Managing and facilitating the implementation of academic accommodations, when needed.
- Offering accommodation-based supports that increase Student capacity for personal success.

6.2.2. AccessAbility Services receives requests for and facilitates Interim Accommodations on a case-by-case basis (for example, where medical documentation is pending). Interim Accommodations will be provided for up to one (1) full term and may be extended as necessary.

6.2.3. AccessAbility Services provides direction and/or recommendations to Course Instructors, or Academic Administrators, and other employees regarding whether there is a duty to accommodate a Student for the purposes of academic accommodations, Retroactive Accommodations, or other exceptions.

6.2.4. AccessAbility Services maintains confidentiality and privacy in exercising its responsibilities under this policy in accordance with AccessAbility Services guidelines, *PHIPA* and *FIPPA,* and Policy 46 – Information Management. This includes informing Students of their rights to privacy, seeking consent to share information as necessary throughout the academic accommodation process, and informing Students how their information is used, stored and protected.

6.2.5. AccessAbility Services facilitates the procedures related to academic accommodations and Interim Accommodations. AccessAbility Services facilitates the procedures related to Retroactive Accommodations unless they are covered under another University process.

6.2.6. AccessAbility Services receives and facilitates all Student requests for Retroactive Accommodations.

6.2.7. AccessAbility Services facilitates informal dispute resolution, as set out in the informal Dispute Resolution Procedures.

6.3. Course Instructors and Graduate Student Supervisors

6.3.1. Course Instructors and Graduate Student Supervisors refer Students to AccessAbility Services. This includes Students who request academic accommodations from them directly or who indicate that their academic accommodation may not be appropriate. Course Instructors or Graduate Student Supervisors should also refer Students whom they suspect might require academic accommodations, Students who mention a permanent or temporary Disability. AccessAbility Services referral guidelines provide the recommended referral practice for these types of referrals as well as example scenarios where Course Instructors and Graduate Student Supervisors should refer Students to AccessAbility Services.

6.3.2. Course Instructors and Graduate Student Supervisors uphold a Student's Accommodation Plan with AccessAbility Services, to the point of undue hardship, with support for example from Departmental Chairs, School Directors, or AccessAbility Services. To facilitate this, Course Instructors and Graduate Student Supervisors:

- Seek clarification from AccessAbility Services when needed.
- Facilitate the implementation of academic accommodations when not already facilitated by AccessAbility Services.
- Participate in the dispute resolution procedures when needed.
- Work collaboratively with AccessAbility Services to determine an alternative accommodation if the proposed accommodation would cause undue hardship, such as fundamentally altering the essential requirements of the course, program, or plan.

6.3.3. To help AccessAbility Services facilitate timely accommodations, Course Instructors and Graduate Student Supervisors engage in the accommodation process in a prompt manner. Course Instructors and Graduate Student Supervisors are also encouraged to follow AccessAbility Services guidelines that outline the recommended timelines for submission of materials.

6.3.4. Where necessary, Course Instructors inform guest lecturers and teaching assistants, or other classroom/lab instructors of a Student's Accommodation Plan and their responsibilities to uphold it.

6.4. Students

6.4.1. Students apply to AccessAbility Services once they have accepted their offer of admission from the University or as soon as they become aware of (or suspect) a need for accommodation, to make the nature of their Disability and or their accommodation needs known.

6.4.2. Students must actively participate in the accommodation process, including:

- Meeting with AccessAbility Services to provide input into the development of an Accommodation Plan.
- Following AccessAbility Services published deadlines (for example, exam booking deadlines or accommodation activation dates).
- Providing appropriate documentation to AccessAbility Services when required, in accordance with AccessAbility Services guidelines.
- Selecting and requesting classroom, alternate format, and or testing accommodations at the start of each academic term or as soon as possible, using AccessAbility Services' online system to activate the Accommodation Plan for the term.
- Requesting Interim Accommodations, as needed, in accordance with AccessAbility Services guidelines.

6.4.3. Students contact AccessAbility Services if there is a change in their condition and or if there are concerns with their individualized Accommodation Plan, or if there is an aspect of education for which there is no Accommodation Plan established.

6.4.4. Students make AccessAbility Services aware of the need for Retroactive Accommodation as soon as they are aware of such need and actively participate in the Retroactive Accommodation Procedures.

6.5. Academic Administrators

Department Chairs or School Directors

6.5.1. Ensure staff and Course Instructors and Graduate Student Supervisors within their respective unit are aware of this policy and its relationship to departmental practices.

6.5.2. Collaborate with AccessAbility Services to resolve informal accommodation disputes, in accordance with the dispute resolution procedure.

6.5.3. Act in their capacity to provide Course Instructors and Graduate Student Supervisors with resources and required supports in order to implement any approved accommodation.

All Academic Administrators Responsibilities

6.5.4. Academic Administrators act in their capacity to support the implementation of academic accommodations across the Student's program of study.

6.6. Academic Advisors

6.6.1. Refer all Students to AccessAbility Services in accordance with section 6.3.2 of this policy.

7. Procedures

7.1. In general, these procedures delineate process and responsibilities in furtherance of the University's accommodation commitments and obligations.

7.2. Principles

7.2.1. The Student accommodation process, including all meetings, are always intended to arrive at the most reasonable accommodation for Students. This process is based on the presumption that better solutions are achieved when discussed directly with the Student.

7.2.2. A Student has the right to support. This includes being accompanied by a support person in any procedure under or associated with this policy. Support persons may accompany Students seeking an accommodation to assist with communication, mobility, personal care, medical needs, and or to provide moral and emotional support to the Student.

7.2.3. The procedures are informed by, and will be guided by, principles of fairness and due process.

7.3. Guidelines created and implemented by AccessAbility Services in furtherance of operationalizing this policy are listed on AccessAbility Services' website and may include:

- Guidelines for referring students to Accessibility Services
- Guidelines to facilitate timely academic accommodations

- Guidelines for protecting personal health information
- Guidelines for documentation requirements
- Guidelines for the development and use of essential requirements in relation to the duty to accommodate

7.4. Process for Establishing Academic Accommodations

7.4.1. Students submit an application to register with AccessAbility Services through the AccessAbility Services website as soon as the need for accommodation becomes known, to make the nature of their Disability and/or their accommodation needs known.

7.4.2. Students submit any supporting documentation directly to AccessAbility Services, and never to their Course Instructor or Graduate Student Supervisor. Medical documentation is not required to apply to register with AccessAbility Services, as Interim Accommodations can be provided pending documentation.

7.4.3. AccessAbility Services staff assess documentation to determine Disability status and eligibility for academic accommodations, and whether further documentation is required.

7.4.4. The Student will be invited by email by AccessAbility Services to book a virtual or in-person appointment with AccessAbility Services to actively participate in planning and discussing their needs, and to finalize their individualized Accommodation Plan.

7.4.5. For course-based accommodations, Students request their eligible course-based accommodations, alternate format, and testing accommodations, using AccessAbility Services' online system, in accordance with AccessAbility Services guidelines. It is understood that this system triggers the Faculty Notification Letter, which is a necessary mechanism to activate and implement accommodations.

7.4.6. The approved Accommodation Plan is communicated from AccessAbility Services to each Course Instructor via the Faculty Notification Letter. Graduate milestone accommodations will be communicated via email to Graduate Student Supervisor or relevant administrator, as the case may be.

7.4.7. The Course Instructor or Graduate Student Supervisor will enable the academic accommodation and will participate in the accommodation process as required. Where a Court Instructor or Graduate Student Supervisor believes the academic accommodation is not suitable, or is concerned about the appropriateness of the accommodation, the dispute resolution process shall be engaged.

7.4.8. Where an Accommodation Plan is not meeting a Student's needs, or when the Student's condition or learning environment has changed, the Student should contact AccessAbility Services to initiate review of their Plan.

7.4.9. The Course Instructor or Graduate Student Supervisor contacts AccessAbility Services if they have questions or concerns with the Accommodation Plan. The Accommodation Plan may be amended as needed, in consultation with the Student.

7.5. Dispute Resolution

7.5.1. A Student or Course Instructor or Graduate Student Supervisor might disagree with any of the following:

- The approved academic accommodation or approved academic accommodation solution.
- The Accommodation Plan as designed by AccessAbility Services.
- The services or supports offered by AccessAbility Services.

7.5.2. Depending on the nature of the dispute, there are two informal dispute resolution processes, that will be engaged prior to the formal dispute processes:

- Academic Accommodation Dispute Process
- Accommodation Plan Dispute Process

7.5.3. In any informal or formal dispute resolution process outlined in these procedures, a Student's Accommodation Plan as defined by AccessAbility Services will apply until a decision is made.

7.6. Dispute Resolution Processes

7.6.1. *Academic Accommodation Dispute Resolution (Informal)*

7.6.1.1. This informal Process governs disputes with an academic accommodation and or the outcome. For example, where a Course Instructor believes that allowing the specific accommodation would cause undue hardship as it would fundamentally alter the course's essential requirements, or where a Course Instructor believes the Student was already accommodated through other means.

7.6.1.2. To initiate the process, a Student or Course Instructor or Graduate Student Supervisor must email AccessAbility Services indicating a dispute with a current academic accommodation.

7.6.1.3. AccessAbility Services responds to parties to set up separate meetings as required. The meetings will attempt to understand and resolve the academic accommodation dispute, including whether an alternate and equivalent academic accommodation can be implemented.

7.6.1.4. If it becomes apparent that the academic accommodation dispute cannot be resolved with these parties, AccessAbility Services contacts the Chair or Director of either the Course Instructor or Graduate Student Supervisor to resolve the matter informally. The Chair or Director will be informed of the recommended academic accommodation, the Student's and the Course Instructor or Graduate Student Supervisor's position and or rationale for disputing the academic accommodation, as applicable, and any other relevant information.

7.6.1.5. Based on the information submitted, the Chair or Director renders a decision on the appropriateness of the accommodation. The Chair or Director has access to campus supports in rendering this decision, including AccessAbility Services. If deemed

that the accommodation is inappropriate, AccessAbility Services works with the Chair or Director as needed to establish an alternate accommodation if possible.

7.6.1.6. The Chair or Director communicates their decision and if applicable the alternate accommodation to the Course Instructor or Graduate Student Supervisor, copying AccessAbility Services.

7.6.1.7. The Course Instructor or Graduate Student Supervisor, or AccessAbility Services, as the case may be, implements the academic accommodation.

7.6.1.8. AccessAbility Services communicates the decision and any changes in the academic accommodation to the Student.

7.6.2. *Accommodation Plan Dispute Resolution Process (Informal)*

7.6.2.1. This informal process governs disputes with the Accommodation Plan as designed by AccessAbility Services and or the services and supports offered by AccessAbility Services.

7.6.2.2. To initiate the process, Students must first speak with an Accommodation Consultant.

7.6.2.3. If the matter is not sufficiently resolved, the matter may be escalated to AccessAbility Services' Manager, Student Accommodations, and then the Associate Director, if needed.

7.6.2.4. AccessAbility Services communicates the decision and any changes to the Accommodation Plan to the Student.

7.6.3. *Formal Dispute Resolution Process*

7.6.3.1. If the accommodation dispute cannot be resolved informally, the Student may seek relief by filing a petition or grievance in accordance with Policy 70 - Student Petitions and Grievances.

7.7. Retroactive Accommodation Procedures

7.7.1. *Retroactive Accommodation Process prior to completion of a course or when actively pursuing an academic milestone*

7.7.1.1. Students must notify AccessAbility Services by email of their request for a Retroactive Accommodation for a specific course or milestone, as soon as the need becomes known. Course Instructors or Graduate Student Supervisors should refer Students who request a Retroactive Accommodation to AccessAbility Services.

7.7.1.2. Students not already registered with AccessAbility Services will be asked to first apply with AccessAbility Services and indicate in their application that they are seeking support for a Retroactive Accommodation.

7.7.1.3. AccessAbility Services staff will:

- Review the request and any provided documentation to determine the need for a Retroactive Accommodation; and/or
- Assess whether further documentation or information is required.

7.7.1.4. As necessary, the Student will be invited to make an appointment with AccessAbility Services to discuss the request for a Retroactive Accommodation. AccessAbility Services may ask the Student to obtain and or submit additional medical documentation to support their request for a Retroactive Accommodation

7.7.1.5. If AccessAbility Services determines a Retroactive Accommodation is required prior to completion of a course or milestone, AccessAbility Services notifies the Course Instructor or Graduate Student Supervisor of the need to provide a Retroactive Accommodation. AccessAbility Services collaborates with the Course Instructor or Graduate Student Supervisor to determine the most appropriate Retroactive Accommodation considering all of the information. If a Course Instructor or Graduate Student Supervisor disputes the accommodation solution offered by AccessAbility Service, the informal dispute process in section 7.6.1 may be followed.

7.7.1.6. If AccessAbility Services determines that the Student is not eligible for Retroactive Accommodations, the decision will be provided to the Student in person or in writing. Students may request a meeting with AccessAbility Services to ask questions or seek clarification.

7.7.2. *Retroactive Accommodation after completion of a course or milestone or after graduation*

7.7.2.1. If the Retroactive Accommodation is for a completed course or milestone, the Student will seek a Retroactive Accommodation via a petition under Policy 70, indicating a request for Retroactive Accommodation.

7.7.2.2. If the Retroactive Accommodation is for a completed course or milestone, and the Student has graduated from the University, the Student will seek a Retroactive Accommodation via a petition, indicating a request for Retroactive Accommodation.

7.8. Student Supports

Students have access to guidance and supports regarding their policy options, that may include:

- Academic advisors
- Associate Deans
- Peer or student support associations
- Office of the Ombudsperson

Appendix A – Glossary

Accommodation Plan. Accommodation plans are designed and facilitated by AccessAbility Services and are individualized and tailored to the Disability-based needs of Students within their academic environment.

Academic Administrators. Associate Deans, Chairs/Associate Chairs, Directors/Associate Directors, or their delegates.

Course Instructor. The individual assigned in Quest to teach and manage a course and can include regular and part-time faculty members, sessionals, staff instructors, visiting faculty, and Course Instructor's delegate. The definition also encompasses an undergraduate student's project or research supervisor. If a course is delegated to someone other than the individual assigned in Quest, AccessAbility Services must be notified of this delegation at the beginning of a term.

Disability. The term "disability" is defined as follows in the Ontario Human Rights Code, R.S.O. 1990, c.H.19, as amended from time to time:

- any degree of physical disability, infirmity, malformation or disfigurement that is caused by bodily injury, birth defect or illness and, without limiting the generality of the foregoing, includes diabetes mellitus, epilepsy, a brain injury, any degree of paralysis, amputation, lack of physical co-ordination, blindness or visual impediment, deafness or hearing impediment, muteness or speech impediment, or physical reliance on a guide dog or other animal or on a wheelchair or other remedial appliance or device,
- a condition of mental impairment or a developmental disability,
- a learning disability, or a dysfunction in one or more of the processes involved in understanding or using symbols or spoken language,
- a mental disorder, or
- an injury or disability for which benefits were claimed or received under the insurance plan established under the *Workplace Safety and Insurance Act, 1997*.

Faculty Notification Letter. The communication, sent by email, from AccessAbility Services to the Course Instructor with the Accommodation Plan.

Graduate Student Supervisor. A faculty member who has Sole-Supervisory Privilege status with respect to the Student, as understood in the Graduate Studies Academic Calendar regulations.

Interim Accommodation. Temporary, reasonable academic accommodations that are implemented on a good-faith basis while an accommodation request is under review or while a Student is in assessment process of diagnosis, and/or obtaining medical documentation, and/or are experiencing barriers in the healthcare system.

Retroactive Accommodation. Requests for an academic accommodation that arises after a deadline or the completion of a test, academic milestone, or course.

Student. An individual who is registered and have paid fees or arranged to pay their fees at the University of Waterloo. This definition also includes individuals who were students and are now seeking a Retroactive Accommodation.

Student Academic Accommodations Policy
SUC, SGC

Graham Brown, Associate University Secretary: Policy And Special Projects

Jennifer Gillies, Associate Provost, Campus Support

UNIVERSITY OF WATERLOO

Who we are

Graham Brown, AUS Policy and Special Projects
(Working Group Policy Support)

Jennifer Gillies, Associate Provost, Campus Support
(Co-Lead Policy Working Group; Policy & Guidelines Team, Accessible Education Project)

Accessible Education Project, Policy and Guidelines Team:

Jennifer Coghlin (Co-Lead), Associate Registrar, Enrolment Services & Academic Policy (Registrar's Office)

David DeVidi (Co-Lead), Professor (Philosophy) | Associate Vice-President, Academic

Jay Dolmage, Professor & Chair (English Language and Literature)

Jennifer Gillies, Associate Provost, Campus Support and Accessibility

Jason Grove, Associate Dean, Undergraduate Studies (Engineering) | Associate Professor, Teaching Stream (Chemical Engineering)

Geoffrey Shifflett, Director (AccessAbility Services)

Nadia Singh, Director, Student Decision and Policy Support

Kate Mercer, Liaison Librarian

UNIVERSITY OF WATERLOO

Why are we here

- Consultations for a new G-Class Policy
- Your opportunity to share feedback, and share policy with your constituents for feedback
- We want all feedback

- Submit to → tii@uwaterloo.ca

UNIVERSITY OF WATERLOO

Why a Student Accommodation Policy is needed

2018

- University creates Student Academic Accommodation Guidelines
- Extensive consultations

2022

- Postsecondary Education Standard under the *Accessibility for Ontarians with Disabilities Act (AODA)* – final recommendations

2023

- Accessible Education Project
  - Multiple goals and deliverables aimed at improving accessible education
  - Sub-project team – Policies and Guidelines team

UNIVERSITY OF WATERLOO

Drafting Process - Snapshot

- Sub-Committee within the Accessible Education Project: Policy & Guidelines Team
- Working Group formed
  - Request to initiate G Policy submitted to the President, 2024
  - Adapt existing Accommodation Guidelines into a Policy + Procedures
- Policy Drafting Committee
  - reviewed the draft prepared by the Working Group
  - review and approve post-consultation edits to the draft prior to submission to the President
- LIS, Ombudsperson, ADU Group, PVP+ - see memo for others

Key Changes and Goals

- Strengthen existing Guidelines: identify and fill gaps
- Retained key procedures from Guidelines
- Follows University policy structure:
  - Clear articulation of Commitments, Scope, Purpose, Prinicples, Roles and Responsibilities
- Informed by scan of other University policies
- Meet all legal (*Code)* requirements related to accommodations for students
- Recommendations for other policies or guidelines

UNIVERSITY OF WATERLOO

Contacts

Submit Feedback to:

tii@uwaterloo.ca

Questions:

Graham Brown

g5brown@uwaterloo.ca

UNIVERSITY OF WATERLOO

Essential Requirements Backgrounder

Questions about this backgrounder? Please email victoria.feth@uwaterloo.ca.

Working Definition

This working definition was developed by the Accessible Education Project – Instructional Programs and Practices team in consultation with interest holders and academic leaders. As a working definition, the team and those consulted recognize that it will evolve with new practices and new evidence.

> *Essential requirements (ERs) are specific learning outcomes (LOs) and/or specifically identified elements of LOs that **all** students must demonstrate in a course or program (including program milestones). ERs are also the skills and knowledge needed to participate in learning activities and assessment activities. ERs must be demonstrated with or without using accommodations, depending on the nature of the ER.*

What is the impetus for the program essential requirements (PERs) project?

Ontario Human Rights Commission (OHRC) Policy on Accessible Education

- "the onus is on an education provider to show that an academic requirement is [essential]."
- PSEs "should clearly set out what the [ERs] of a course or program are, to enhance transparency, consistency, fairness…"

Accessibility for Ontarians with Disabilities Act (AODA) Proposed Postsecondary Education Standard

- Rec. 49 Identification and communication of bona fide and essential requirements
- ERs "shall be made publicly available"
- Not enacted yet

Rationale for Working Definition

Why are PERs important to identify?

- Students can make better informed decisions about which programs to apply to.
- Program designs and expectations are more transparent to instructors.
- Instructors can design courses to align to PERs.
- PERs can support AAS in accommodations conversations, which often refer to course learning outcomes.
    - ERs "guide decisions about accommodations for individuals with disabilities" (Student Academic Accommodation Guidelines).

Why is there no existing definition of ERs that we can adopt?

- The Ontario Human Right Commission (OHRC) states, "While courts and tribunals have provided little guidance on the nature of essential duties and requirements, terms that have been used include 'indispensable,' 'vital,' and 'very important.'… Depending on the level of education in question, essential requirements may be defined quite differently."

- Waterloo's current Student Academic Accommodation Guidelines quote Stanford University: "Essential requirements refer to the knowledge and skills that all students must demonstrate with or without using accommodations." "Outcomes" are not included in this definition, and they are important to understanding ERs. Moreover, this definition is too brief and is difficult to operationalize.

Why is participation part of the proposed working definition of ERs?

- The university, by law, must deliver an accessible education, levelling the playing field for all students to be successful. According to the OHRC, otherwise qualified students with a disability should be able to access and participate in university-sponsored programs. Participation includes formative (ungraded or low stakes) assessments and learning activities, given their importance to student learning and preparation for summative assessments.
- ERs should not include ableist assumptions about how students can participate in assessment activities and learning activities. To avoid discriminatory ERs, the following questions should be considered:
    - Is the requirement rationally connected to the task or purpose it is intended for (as opposed to habit, tradition, ease)?
    - Is there evidence to support that the requirement is essential?
    - Is the requirement socially constructed such that it excludes specific groups for a reason that is irrelevant based on assumptions about function or the group?

Why are learning outcomes (LOs) part of the working definition of ERs?

- LOs identify the learning (knowledge, skills, attitudes) that students demonstrate to achieve grades. In other words, LOs are "what" successful students should demonstrate by the end of a course or program. All programs have written LOs as do many courses.
- Instructors are key to defining ERs and can draft course-level ERs, but they should engage in program-level discussions with program leaders (e.g., department chairs, curriculum committees) to ensure alignment throughout the program. Any ER can be disputed or disrupted (e.g., by a student or technological advances).
- Details about ER disputes, including undue hardship, are beyond the scope of this project; UW's dispute process can be found in the Student Academic Accommodation Guidelines.

Implementing Essential Requirements within Academic Programs

12/09/25

Presented for Senate Undergraduate Council by:

Donna Ellis and Victoria Feth, Centre for Teaching Excellence
Diana Skrzydlo, Department of Statistics and Actuarial Science

We would like to acknowledge the contributions of the Accessible Education Project – Instructional Programs and Practices team.

UNIVERSITY OF WATERLOO

Why Are Program Essential Requirements Important to Identify?

Students	Programs	Instructors	AccessAbility Services (AAS)
• Students can make better informed decisions about which programs to apply to.	• Program designs and expectations are more transparent to instructors.	• Instructors can design courses to align to program essential requirements (PERs).	• PERs can support AAS in accommodations conversations, which often refer to course learning outcomes.

- Accessibility for Ontarians with Disabilities Act (AODA)
- Proposed postsecondary education standards – Recommendation 49: Identification of essential requirements

University of Waterloo's Working Definition

Essential requirements (ERs) are specific learning outcomes (LOs) and/or specifically identified elements of LOs that **all** students must demonstrate in a course or program (including program milestones).

ERs are also the skills and knowledge needed to participate in learning activities and assessment activities.

ERs must be demonstrated with or without using accommodations, depending on the nature of the ER.

Important Foundations of the Working Definition

- Instructors are key to defining ERs and can draft course ERs, but they should engage in program-level discussions with program leaders to ensure alignment throughout the program.
- PERs are not all content in courses that make up a program.
- PERs should stand up to scrutiny. **They are for all students** (i.e., not arbitrary).
- Any ER can be disputed or disrupted (e.g., by a student or technological advances).
    - E.g., “hear a heartbeat” vs. “perceive a heartbeat” – the latter considers technology (amplified stethoscopes)

Learning Outcomes and Essential Requirements

- What indicates that an LO, or an element of an LO, is **likely** an ER?
  - The LO cannot be altered and must be demonstrated in one specific way. These LOs may not be able to be modified or omitted without compromising safety or the integrity of the program.
  - If students cannot do the LO, they will fail the course and/or be unable to proceed in their program.
- Why aren't all LOs also ERs?
  - LOs may be poorly articulated and/or incomplete and/or miss stating assumed skills.
  - LOs may include outcomes that are typically not essential, such as aspirational outcomes, values, and attitudes.
  - LOs may include ways in which outcomes must be demonstrated that are not essential, e.g., how a student must demonstrate their knowledge and skills; the "how" is often what can be modified.

Participation and Essential Requirements

- Why is participation part of the working definition of ERs?
  - According to the Ontario Human Rights Commission (OHRC), otherwise qualified students with a disability should be able to **access** and **participate** in university-sponsored programs.
  - Participation includes formative (ungraded or low stakes) assessments and learning activities, given their importance to student learning and preparation for summative assessments.
- ERs should not include ableist assumptions about how students can participate in assessment activities and learning activities.

Resources

- Essential Requirements Backgrounder (shared beforehand)
- Writing Intended Learning Outcomes teaching tip (UW – CTE website)
- Student Academic Accommodation Guidelines (UW website)
- Get in touch!
  - victoria.feth@uwaterloo.ca
  - donnae@uwaterloo.ca
  - dkchisho@uwaterloo.ca

QUESTIONS?

UNIVERSITY OF WATERLOO

Thank you!

UNIVERSITY OF WATERLOO | Senate

For Approval **Open Session**

To:	Senate Undergraduate Council
From:	David DeVidi Associate Vice-President, Academic
Date of Meeting:	December 9, 2025
Agenda Item:	**9. Credentials Framework Report Recommendation - Senate Alternative Credentials Committee**

Summary
David DeVidi, AVP, Academic, will provide an overview of the draft proposal for the creation of the Senate Alternative Credentials Committee as presented to Senate Executive Committee. The proposal is being brought to SUC for feedback and, we hope, a formal recommendation to Senate to proceed with the creation of SACC. As noted below, the idea for this committee was previously discussed at SUC in November 2024.

In alignment with the 2021–2025 Strategic Plan *Connecting Imagination with Impact*, particularly the theme *Developing Talent for a Complex Future*, the University established a working group to develop a Credentials Framework. Throughout 2023, the working group conducted extensive consultations with faculty, students, and staff, and undertook significant research.

The finalized Credentials Framework Report was released in Spring 2024 and recommended the creation of a new Senate committee to oversee the approval of alternative (non-credit) credentials. This committee will replace the existing Alternative Credentials Approval Committee (ACAC), currently managed by the AVPA Office, and will strengthen the formal connection between Senate and the University's growing engagement with alternative academic credentials while maintaining the efficacy of the ACAC structure.

Jurisdictional Information
Section 22 of the University of Waterloo Act, 1972 empowers Senate:

> (m) to create councils and committees to exercise its powers;

Proposed Governance Pathway
Senate Graduate and Research Council: October 21, 2024 (initial discussion)

Senate Undergraduate Council: November 19, 2024 (initial discussion)

Senate Executive Committee: November 10, 2025

Senate Graduate Council: November 17, 2025

Senate Undergraduate Council: December 9, 2025

Prospective:

Senate Executive Committee: January 12, 2026

Senate: January 26, 2026

Documentation Provided
Draft Senate Alternative Credentials Committee Terms of Reference

Draft Senate motion creating Senate Alternative Credentials Committee

Recommendation/Motion:
To recommend Senate approve the creation of the proposed Senate Alternative Credentials Committee, as presented.

Summary:
In response to the recommendations of the 2021-2025 Strategic Plan, *Connecting Imagination with Impact*, and in particular the objectives and recommendations under the theme of Developing Talent for a Complex Future, the University established a working group tasked with developing a Credentials Framework to address the following objectives articulated in that Plan:

- Promoting quality and innovation in teaching and learning
- Removing barriers to collaboration, interdisciplinarity, and the integration of knowledge
- Increasing the flexibility of curricula
- Facilitating the development of academic programs that stimulate reflective, deep learning and developing competencies to address global challenges and opportunities
- Developing more flexible graduate-level academic programming
- Establishing a lifelong learning centre that will enable and encourage our alumni and other professionals to reskill in a society that increasingly values lifelong learning
- Leveraging and optimizing government, industry and community partnerships that create lifelong learning opportunities

Co-Chaired by the Associate Vice-President, Academic and the Registrar, and comprising faculty representatives and professional staff with relevant expertise, the Working Group consulted widely on campus with faculty, students and staff in 2023 and carried out substantial research. The Group synthesized what it learned into a series of recommendations, which were then shared with experts on campus who helped identify any potential unintended consequences of the recommendations as drafted. The recommendations were then finalized in a Credentials Framework Report shared with the senior academic leadership of the University in Spring 2024.

One of the key recommendations of the Credentials Framework Report is the creation of a new Senate committee to handle approval of alternative (i.e., non-credit) credentials, which the working group proposes could be called the *Senate Alternative Credentials Committee (SACC).* The intention is to replace the current Alternative Credentials Approval Committee (ACAC), which runs out of the AVPA Office. The new committee will create a closer and more formalized link between Senate and the University increasingly substantial academic involvement in alternative credentials while preserving the virtues of the existing ACAC framework. The draft proposal of the committee's composition and remit is included below.

Governance Path: TBD

Proposal:
That Senate creates a new Senate Alternative Credentials Committee.
Contextual Remarks:

In 2020-21, the University established WatSPEED as an ancillary unit to accelerate the development of non-credit academic programming aimed at mid-career professionals. A small working group led by the AVPA and including the AVPGSPA was tasked with considering governance questions for this programming. It quickly became clear that two considerations needed to be balanced:

i. The University community wanted assurance that our offerings would have academic credibility and that the reputation of the University was safeguarded.
ii. To be a viable player in this market, WatSPEED needs to be able to "move at the speed of business," so the approval pathway needs to be much more efficient than the pathways for for-credit offerings.

The solution devised by this working group was the creation of the Alternative Credentials Approval Committee (ACAC). ACAC replaced an existing committee, the Professional Development Advisory Committee (PDAC) chaired by the AVPA (as the Executive Committee members to whom the Centre for Extended Learning, then the unit responsible for PD offerings, reported). Since at least 1973, Senate has not required approval of non-credit credentials via one of its established Councils. In 2003 Senate approved a recommendation regarding definitions and approvals of (what we can call for convenience) for-credit offerings and distinguishing them from other sorts of credentials. In 2005 it was specified that what is now CEL should have its non-credit offerings overseen by a council or committee that would establish a "policy" or standards for continuing education programming, headed by the position that is now the AVPA and including representation from the Faculties. There are no Senate records of the decisions or work of the PDAC since 2005.

ACAC carries out its work asynchronously and online. As voting members, it includes faculty representatives from every Faculty appointed by the Dean, the AVPA (who serves as chair), and the AVPGSPA. ACAC also includes, as non-voting resources to the committee, delegates from several of the Academic Support Units on campus. Since 2021 it has approved approximately two dozen non-credit credentials. Most are developed in collaboration with WatSPEED but there have also been credentials developed without WatSPEED involvement, including those developed by the Centre for Teaching Excellence, Cooperative and Experiential Education, and the Sustainability Office.

There are two primary reasons for recommending that ACAC be replaced by an official Senate Committee and clarifying its remit.

1. The lifelong learning offerings that are now the primary work of ACAC are generally of a different sort, and aimed at a different audience, than the offerings traditionally approved by the PDAC. (These were primarily the sort of "interest courses" that are the traditional subjects of continuing education offerings or the professional development courses that were the primary business of the PD unit of the Centre for Extended Learning.) The current credentials are generally aimed at mid-career professionals and are clearly "university level learning," sometimes at the graduate level. The rationale that presumably removed PDAC credentials from Senate oversight in 2005 do not apply in the same way to credentials of the sort ACAC has been approving.
2. The existing Senate rationale legitimizing PDAC activities is somewhat vague, places constraints on what ACAC can legitimately approve, and is likely to prove unduly restrictive as the University's academic programming evolves to meet the needs of the future. For instance, the Senate materials from 2005 say that any "course" that "approximates the length and content of 0.5 unit on campus courses" requires approval from an official Senate Committee, a process that can take a significant amount of time (at least weeks and probably months, vs. the

five-day turnaround typical for ACAC). [This proscription may rule out, for instance, the development of partnerships between WatSPEED and professional organizations seeking to offer programming related to maintenance of professional standing, where something that "approximates" a 12-week course may be exactly what is required, and the current wording suggests it would therefore need approval by Senate Undergrad or Senate Grad an Research, where the approval pathways are too cumbersome. In accordance with the recommendations of the Credentials Framework Report, the proposed remit for SACC distinguishes credit from non-credit offerings in terms of the audience and whether a course can count towards a degree, instead of focusing on whether the offering "approximates a 0.5 credit course".]

The Credentials Framework Report includes as a subsidiary recommendation that

i. The new SACC needs to maintain the nimbleness for which ACAC has been praised while providing an appropriate degree of academic oversight for the sorts of credentials on offer. That is, a credential certifying participation in a workshop of mastery of a particular practical skill does not require the level of detailed scrutiny required for a new degree program. We therefore recommend that: SACC should be much smaller than either SUC or SGRC (as ACAC is currently)
ii. SACC continue to work primarily online and asynchronously
iii. SACC's voting membership should include a representative from each Faculty in addition to the AVPA and AVP GSPA

SACC's membership should include "resource" members from relevant ASUs who can inform decision-making in a timely and effective manner.

Proposed Structure and Remit for Senate Alternative Credentials Committee:

Draft Terms of Reference - Senate Alternative Credentials Committee

Whereas at the University of Waterloo a degree is generally understood to require the completion of specified courses and milestones (e.g., at the graduate level milestones may include comprehensive exams, major research projects, theses, and the like), those courses and milestones which *can* count towards a degree shall be defined as those "for credit." Academic offerings that are not "for credit" in that sense shall be referred to as "alternative credentials."

The Senate Alternative Credentials Committee shall have the following powers and responsibilities:

1. On behalf of Senate, to approve alternative credentials, including microcredentials.
2. On behalf of Senate, to establish rules and procedures for the development and approval of alternative credentials, which appropriately balance between ensuring the academic credibility of credentials and the need for efficient decision-making to meet the needs of the learners who earn the alternative credentials.
3. To report annually to Senate on the which alternative credentials have been approved.
4. To work collaboratively with Senate and the Senate councils allocated responsibility for the academic quality of undergraduate and graduate studies, for situations where it is unclear whether the credentials under development are for credit or alternative credentials.

Membership
Voting members:

- The Associate Vice-President, Academic, who shall chair this committee.
- The Associate Vice-President, Graduate Studies and Postdoctoral Affairs.
- Six faculty members, one from each Faculty, to be appointed by the Dean of said faculty. Normally this faculty member will be an Associate Dean with responsibility for lifelong learning for the Faculty.

Non-voting resource members will include delegates appointed by:

- The Registrar
- The Director, WatSPEED
- The Director, Centre for Extended Learning
- The Director, Centre for Teaching Excellence
- The Associate Provost, Cooperative and Experiential Education
- The Associate Provost, Institutional Analysis and Planning