Senate Undergraduate Council

November 19, 2024

1:00 p.m. - 3:00 p.m.

Needles Hall

NH 3318 / Virtual Option

Waterloo Campus

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2024 11 19 Senate Undergraduate Council Meeting Book

AGENDA

13. Adjournment

Next meeting of SUC is January 28, 2025

Excerpt from Senate Bylaw 1

8. Declarations of conflict of interest

8.01	At the beginning of each meeting of Senate or any of Senate's committees or councils, the chair will call for members to declare any conflicts of interest with regard to any agenda item. For agenda items to be discussed in closed session, the chair will call for declarations of conflict of interest at the beginning of the closed portion of the meeting. Members may nonetheless declare conflicts at any time during a meeting.
8.02	A member shall be considered to have an actual, perceived or potential conflict of interest, when the opportunity exists for the member to use confidential information gained as a member of Senate, or any of Senate's committees or councils, for the personal profit or advantage of any person, or use the authority, knowledge or influence of the Senate, or a committee or council thereof, to further her/his personal, familial or corporate interests or the interests of an employee of the university with whom the member has a marital, familial or sexual relationship.
8.03	Members who declare conflicts of interest shall not enter into debate nor vote upon the specified item upon which they have declared a conflict of interest. The chair will determine whether it is appropriate for said member to remove themselves from the meeting for the duration of debate on the specified item(s).
8.04	Where Senate or a committee or council of Senate is of the opinion that a conflict of interest exists that has not been declared, the body may declare by a resolution carried by two-thirds of its members present at the meeting that a conflict of interest exists and a member thus found to be in conflict shall not enter into debate on the specified item upon which they have declared a conflict of interest. The chair will determine whether it is appropriate for said member to remove themselves from the meeting for the duration of debate on the specified item(s).

University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Minutes of the September 17, 2024 Meeting

Present: Katherine Acheson, Faisal Al-Faisal, Veronica Austen, Benoit Charbonneau, Victoria Chu, Ashley Day (secretary) Laura Deakin, Chloe Ding, David DeVidi (chair), Leanne Ferries, Mike Grivicic (secretary) Jason Grove, Carol Ann MacGregor, Kristiina Montero, Cathy Newell Kelly, Alex Pawelko, Cynthia Richard, Helena Shilomboleni, Chris Vigna, Johanna Wandel, Richard Wikkerkink

Resources/Guests: Maya Baboolal, Angela Christelis, Maysah Eid, Danielle Jeannault, Carrie MacKinnon Molson, Melanie Will, Susan Willsie

Absent: Avery Akkerman, Namrah Hasan, Nicholas Pfeifle, Brandon Que, Victoria Swanson, William Wong

Organization of Meeting David DeVidi took the chair, and Ashley Day acted as secretary. The secretary advised that a quorum was present. The agenda was approved without 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. Charbonneau and Deakin. Carried.

2. MINUTES OF THE JUNE 17, 2024 MEETING
Council approved the minutes of the meeting as distributed.

3. CURRICULAR SUBMISSIONS
Council approved item 3(a) on behalf of Senate.

REGULAR AGENDA

4. BUSINESS ARISING FROM THE MINUTES
There was no business arising.

5. Chair's Remarks
DeVidi introduced Ashley Day, a new member of the Secretariat team who will be supporting this council as well as other governance bodies within the Senate Portfolio. DeVidi welcomed back Benoit Charbonneau and Veronica Austen from sabbatical and new members Faisal Al-Faisal and Alex Pawelko. It was noted that the calendar invites for SUC will indicate a two-hour length, but the intent is for the meeting to normally be completed within 90 minutes, dependent on the agenda required.

6. Curricular Submissions
Charbonneau spoke to the Mathematics submissions and the two recommendations.

Recommendation 1: Quantum Information Option - Creation of a new option. To be governed by the faculty with owner units AM, CO, CS and PM.

Recommendation 2: Averages and Academic Standings – Addition of First-Term Withdrawal Policy. There is a first term withdrawal provision, in 2019 we introduced a triple counting rule and haven't revisited this until recently. It was important to bring it into full view in the calendar, so all students are aware. Members discussed: the process in place for advisory support if students intend to be absent; data will be collected on the success of this change; goal of the policy is to provide additional clarity to students.

A motion was heard to recommend Senate approve the proposed changes, as presented (1 Senate Regular & 2 Senate Consent). Al-Faisal and Acheson. Carried.

7. Waterloo Values

Melanie Will and Susan Willsie presented an update on the Institutional Values project: the project speaks to UW culture, values and actions, and why they are important; what do we value and how does it shape our culture; aim for the message to go wider, to provide common language, and to speak with people throughout the campus community about the work. Next steps include a taskforce being established, values champions being identified, integration into onboarding and performance development, and the drafting of behaviour statements is in progress. Members discussed how changes to existing processes would be made through the taskforce; ensuring people are empowered to make change and the importance of having the right decision makers in the room; using the values as guidelines to daily work and decision making.

Members also discussed: how do you ensure you are creating what you hope for out of the values; use of taskforce to help vet changes and tracking how the values make change across the institution; this is applied relatively easily in the HR space but the trickier parts will be elsewhere and embedding this into the regular work of the University; hope that the values can be used as a tool for how to think differently about a problem; seeking to have faculty on the taskforce; highlighted the importance of personal reflection; want students to translate these values into the work they are doing; student members spoke to identification of tangible outcomes or projects linked to this work; members would like to see more student engagement and a summary of faculty engaged in the development process for visibility.

DeVidi thanked Melanie and Susan for presenting.

As an additional resource, Imperial College offers case studies on their website that offers context as a follow-up to the conversation: https://www.imperial.ac.uk/about/values/embedding-the-values/casestudies/

The Waterloo Values can be found on the Values webpage: https://uwaterloo.ca/values/

8. Curricular Subcommittee Pilot

DeVidi spoke to the outcomes seen from the subcommittee pilot: membership comprised of ADs and a student member who produce consent agenda items for the larger SUC; goal to free up bandwidth at SUC for discussion of larger, strategic issues; the pilot was approved with the requirement for reporting back on its effectiveness. Members discussed: meeting in person vs online; importance of reviewing the consent agendas carefully; SUC would like to see more student feedback; feedback regarding curriculum changes since pilot has increased in quality; Senate orientation or faculty onboarding could facilitate training on what to look for as part of governance processes pertaining to curriculum review; transition of student members is important.

A motion was heard to recommend to Senate that SUC will continue the curriculum subcommittee indefinitely. DeVidi and Pawelko. Carried.

9. OTHER BUSINESS

DeVidi requested that members send ideas for committee agenda/discussion items to Day or himself, to develop a list of items for future meetings. The Credential Framework report is slated for the next meeting, where the proposed next steps will be for SUC to support the report prior to Senate submission.

Charbonneau asked for clarification on the implementation of the BoardEffect portal, and Grivicic indicated: the portal is an outcome of the Senate Governance Review; objective to provide a single place to facilitate all governance activity; we currently are in a transition period and running both SharePoint and BoardEffect in parallel; open version of minutes and agenda packages will still be available publicly on the Secretariat website; there are known issues for MAC users and shared email accounts.

10. ADJOURNMENT

With no further business, the meeting adjourned. The next meeting will be held on Tuesday, November 19, 2024, from 1-3pm in NH 3318.

September 23, 2024

Ashley Day
Governance Officer

SUC - 2024-11 - Consent Agenda - Faculty of Mathematics

Meeting Information

Agenda Page Title

SUC - 2024-11 - Consent Agenda - Faculty of Mathematics

Career Level	Faculty/Unit
Undergraduate	Mathematics

Date	Time	Location
11/19/2024	1:00pm	Needles Hall 3318 / Virtual option

Summary

1. Retired Courses

No Business.

2. New Courses

- **AMATH 345** - Creation of a new course in Data-Driven Mathematical Models.

3. Course Changes

- **ACTSC 232** - MTHEL 131 moved from prerequisite to corequisite.
- **ACTSC 445** - Updated prerequisites.
- **ACTSC 446** - Updated prerequisites.
- **AMATH 242** - Updated prerequisites (cross-listed with CS 371).
- **AMATH 391** - Updated title, abbreviated title, description, and prerequisites.
- **AMATH 451** - Updated prerequisites.
- **AMATH 453** - Updated prerequisites.
- **AMATH 455** - Updated prerequisites.
- **CS 371** - Updated prerequisites (cross-listed with AMATH 242).
- **CS 453** - Addition of antirequisite.
- **CS 459** - Addition of antirequisite.

4. Minor Program/Plan Modifications

- **H-Actuarial Science** - Updated Declaration Requirements and removal of restricted-enrolment plan.
- **JH-Actuarial Science** - Updated Declaration Requirements.
- **Engineering Specialization** - Updated Required Courses to include common substitution.
- **Computing Minor** - Computer Engineering Option, Software Engineering Option, and Computing Option added to List of Invalid Combinations.

Other Business

Attachment(s)

Course Proposals

Course Proposal Details

Courses: Retire

No proposals have been added.

Courses: New

Code	Title	Type	Workflow Step
AMATH 345	Data-Driven Mathematical Models	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review

Courses: Changes

Code	Title	Type	Workflow Step
ACTSC 232	Life Contingencies 1	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
ACTSC 445	Quantitative Enterprise Risk Management	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
ACTSC 446	Mathematics of Financial Markets	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
AMATH 242	Introduction to Computational Mathematics	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
AMATH 391	Data Analysis with Fourier and Wavelet Methods	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
AMATH 451	Introduction to Dynamical Systems	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
AMATH 453	Partial Differential Equations 2	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
AMATH 455	Control Theory	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
CS 371	Introduction to Computational Mathematics	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
CS 453	Software and Systems Security	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
CS 459	Privacy, Cryptography, Network and Data Security	Course	SUC Subcommittee, SUC Curricular Subcommittee | Under Review

Programs & Plans Proposals

Programs & Plans Proposal Details

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-Actuarial Science	Actuarial Science (Bachelor of Mathematics - Honours)	Program	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
JH-Actuarial Science	Actuarial Science (Joint Honours)	Program	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
Engineering Specialization	Engineering Specialization	Program	SUC Subcommittee, SUC Curricular Subcommittee | Under Review
Computing Minor	Computing Minor	Program	SUC Subcommittee, SUC Curricular Subcommittee | Under Review

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.

AMATH 345
Data-Driven Mathematical Models

Under Review | Fall 2025

Proposal Information

Workflow Status

In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand

Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Effective Date & Career

Career
Undergraduate

Important!

Quest Course ID

Effective Term and Year
Fall 2025

Offering Number

Proposal Details

Proposal Type
New

Academic Unit Approval
09/16/2024

Rationale for New Course

There is an increasing overlap between data-driven methods, neural networks, and the field of applied mathematics. Data-driven discovery is revolutionizing the modeling and prediction of complex systems.

This course aims to bridge the gap between modern data science methods and classical fields of applied mathematics, mathematical physics, applied sciences, and engineering. Typically, students of applied math and engineering have backgrounds in linear algebra, differential equations, and scientific computing but may have limited exposure to data-driven methods. Similarly, computer scientists and statisticians may have little experience with dynamical systems models of physical reality.

The course provides an integrated introduction to modeling of dynamical systems using modern data science methods. It prepares students to apply recent advances in data-driven methods to a wide range of applications.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations

Supporting Documentation

- AMATH345_Outline.pdf.pdf

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Subject Code
AMATH

Number
345

Course Level
300

Title
Data-Driven Mathematical Models

Abbreviated Title
Data-Driven Models

Description
An introduction to data-driven mathematical methods for modelling and prediction of complex systems in science, medicine, and technology. Topics include singular value decomposition, sparsity and compressed sensing, calibration and parameter inference for differential equation models, as well as neural networks and data-driven methods for dynamical systems. Throughout the course, students will learn to use modern data science methods and apply recent advances in data-driven methods to a wide range of applications.

Units
0.50

Undergraduate Communication Requirement Identifier
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:
    - AMATH250 - Introduction to Differential Equations (0.50)
    - AMATH251 - Introduction to Differential Equations (Advanced Level) (0.50)
    - MATH228 - Differential Equations for Physics and Chemistry (0.50)
  - Must have completed at least 1 of the following:
    - PHYS267 - Probability, Statistics, and Data Analysis for Physics and Astronomy (0.50)
    - STAT202 - Introductory Statistics for Scientists (0.50)
    - STAT206 - Statistics for Software Engineering (0.50)
    - STAT221 - Statistics (Non-Specialist Level) (0.50)
    - STAT231 - Statistics (0.50)
    - STAT241 - Statistics (Advanced Level) (0.50)
  - Must have completed at least 1 of the following:
    - CS114 - Principles of Computing for Science (0.50)
    - 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)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path

Committee approvals

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Dependent Courses and Programs/Plans

There are no dependencies

ACTSC 232
Life Contingencies 1

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Corequisites
- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
3294

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
1

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
06/28/2024

Rationale for Change
Students can safely take MTHEL 131 in the same term they are taking ACTSC 232. The change from pre-req to co-req will provide additional flexibility to allow students to choose to pursue their ACTSC major a bit later in their academic journey.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Statistics and Actuarial Science

Subject Code
ACTSC

Number
232

Course Level
200

Title
Life Contingencies 1

Abbreviated Title
Life Contingencies 1

Description
The future lifetime random variable: probability and survival functions; force of mortality; complete and curtate expectation of life; Makeham and Gompertz mortality laws. Life tables: characteristics of population and insurance life tables; selection; fractional age assumptions. Life insurance payments and annuity payments: present value random variables; expected present values; higher moments; actuarial notation. Annual, 1/mthly, and continuous cases. Relationships between insurance and annuity functions. Premiums: expense loadings. Present value of future loss random variables and distribution, net and gross cases. Equivalence principle. Portfolio percentile principle. Extra risks.

Units
0.50

Undergraduate Communication Requirement Identifier
No

Components
LectureTest SlotTutorial

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:
    - STAT230 - Probability (0.50)
    - STAT240 - Probability (Advanced Level) (0.50)
  - Earned a minimum grade of 60% in each of the following:
    - ACTSC231 - Introductory Financial Mathematics (0.50)
  - ~~Earned a minimum grade of 60% in each of the following:~~
    - ~~MTHEL131 - Introduction to Actuarial Practice (0.50)~~

Corequisites

- **Completed or concurrently enrolled in:**
  - **MTHEL131 - Introduction to Actuarial Practice (0.50)**

Antirequisites

- Not completed nor concurrently enrolled in:
  - ACTSC331 - Life Contingencies 2 (0.50)

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

ANTIREQUISITES

- ACTSC 231 - Introductory Financial Mathematics — View Courses

COURSE REQUIREMENTS (NO UNITS)

- Actuarial Science Minor - Actuarial Science Minor — View Programs
- JH-Actuarial Science - Actuarial Science (Joint Honours) — View Programs
- H-Actuarial Science - Actuarial Science (Bachelor of Mathematics - Honours) — View Programs

PREREQUISITES

- ACTSC 331 - Life Contingencies 2 — View Courses

ACTSC 445
Quantitative Enterprise Risk Management

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career
Undergraduate

Important!

Quest Course ID
9492

Proposed
Effective Term and Year
Fall 2025

Offering Number
1

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
06/28/2024

Rationale for Change
In the past, Math/CPA and CFM students were allowed to take ACTSC 445. This is no longer the case as both plans are not listed on the list of eligible plans to take this course. In fact, none of these students have taken ACTSC 445 in the last 10 years. The pre-requisites of AFM 275/AFM 372/ACTSC 391 were the paths previously taken by these students to take the course and need to be removed.
For students transferring into ACTSC later in their academic career, the prerequisite of ACTSC 372 will remain necessary, as it is a degree requirement for all ACTSC majors and is deemed necessary to adequately prepare students for the mathematical rigor of ACTSC 445.
Additionally, ACTSC 371 is a discontinued course (since the 2023-2024 calendar). ACTSC 231 will need to be removed with it, as prior to the transition to Kuali the prerequisite required students to take both ACTSC 371 and ACTSC 231, which is no longer possible. The last offering of the course was in Winter 2023. This pre-requisite path was kept in the calendar for 2 more years to allow students to use this pre-requisite to enroll into ACTSC 445.
Approved at UAC on 20240930
Approved at FC on 20241022

Consultations
Consultation with Darren Charters, Deputy Director Student Experience, SAF, 2024-11-06, and with ADUG Arts Katherine Acheson on 2024-10-30.

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Statistics and Actuarial Science

Subject Code
ACTSC

Number
445

Course Level
400

Title
Quantitative Enterprise Risk Management

Abbreviated Title
Quantitative Ent Risk Mgmt

Description

This course introduces enterprise risk management, with a focus on quantitative analysis and economic capital. Risk classification is first discussed with an emphasis on the types of risk most suited to quantitative methods. Risk measures, such as Value-at-Risk (VaR) and Conditional Tail Expectation (CTE or TVaR), are then introduced and their use by firms and regulators to determine risk capital requirements is further highlighted. Different approaches are considered for developing loss distributions, including frequency/severity analysis and extreme value theory. Copulas and economic scenario generators are used to aggregate dependent risks. Different strategies for mitigating or transferring risk are reviewed. Additional topics that may be covered include credit risk, capital allocation, and regulation of financial institutions.

Units

0.50

Undergraduate Communication Requirement Identifier

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
    - Complete 1 of the following
        - ~~Complete 1 of the following~~
            - ~~Must have completed at least 1 of the following:~~
                - ~~ACTSC391 - Corporate Finance~~ ~~(0.50)~~
                - ~~AFM275 - Corporate Finance~~ ~~(0.50)~~
            - ~~Must have completed the following: AFM372~~
        - ~~Complete all of the following~~
            - ~~Must have completed the following:~~
                - ~~ACTSC231 - Introductory Financial Mathematics~~ ~~(0.50)~~
            - ~~Must have completed the following: ACTSC371~~
        - Must have completed the following:
            - ACTSC372 - Investment Science and Corporate Finance (0.50)
        - Must have completed the following: BUS393W
    - Complete 1 of the following
        - Must have completed the following:
            - STAT330 - Mathematical Statistics (0.50)
            - STAT333 - Stochastic Processes 1 (0.50)
        - Must have completed the following:
            - STAT334 - Probability Models for Business and Accounting (0.50)
    - Enrolled in H-Actuarial Science, JH-Actuarial Science, H-Mathematical Finance, H-Math/FARM - Chartered Financial Analyst Spec, or H-Math/FARM - Professional Risk Management Spec

Corequisites

No Rules

Antirequisites

- Complete all of the following
    - Not completed nor concurrently enrolled in:
        - AFM422 - Management of Financial Institutions (0.50)
        - MATBUS472 - Risk Management (0.50)
    - Not completed nor concurrently enrolled in: BUS433W, BUS439W

Course Notes

Fee Statement

Notes

ACTSC 446
Mathematics of Financial Markets

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
3305

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
1

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
06/28/2024

Rationale for Change
In the past, Math/CPA and CFM students were allowed to take ACTSC 446. This is no longer the case as both plans are not listed on the list of eligible plans to take this course. In fact, none of these students have taken ACTSC 446 in the last 10 years. The pre-requisites of AFM 275/AFM 372/ACTSC 391 were the paths previously taken by these students to take the course and need to be removed.
For students transferring into ACTSC later in their academic career, the prerequisite of ACTSC 372 will remain necessary, as it is a degree requirement for all ACTSC majors and is deemed necessary to adequately prepare students for the mathematical rigor of ACTSC 446.
Additionally, ACTSC 371 is a discontinued course (since the 2023-2024 calendar). ACTSC 231 will need to be removed with it, as prior to the transition to Kuali the prerequisite required students to take both ACTSC 371 and ACTSC 231, which is no longer possible. The last offering of the course was in Winter 2023. This pre-requisite path was kept in the calendar for 2 more years to allow students to use this pre-requisite to enroll into ACTSC 446.
Approved at UAC on 20240930
Approved at FC on 20241022

Consultations
Consultation with Darren Charters, Deputy Director Student Experience, SAF, 2024-11-06, and with ADUG Arts Katherine Acheson on 2024-10-30.

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Statistics and Actuarial Science

Subject Code
ACTSC

Number
446

Course Level
400

Title
Mathematics of Financial Markets

Abbreviated Title
Math of Financial Markets

Description
This course covers mathematical techniques for no-arbitrage pricing and hedging financial derivatives. Topics to be covered can be classified into three broad areas: derivatives markets (options; forwards and futures; other derivatives; put-call parity), discrete-time financial models (binomial models; general multi-period models; Fundamental Theorems of Asset Pricing; risk-neutral probability), and continuous-time financial models (basic stochastic calculus and Itô's lemma; Black-Scholes model; interest rate models and bond pricing).

Units
0.50

Undergraduate Communication Requirement Identifier
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
  - ~~Complete 1 of the following~~
    - ~~Complete 1 of the following~~
      - ~~Must have completed at least 1 of the following:~~
        - ~~ACTSC391 - Corporate Finance (0.50)~~
        - ~~AFM275 - Corporate Finance (0.50)~~
      - ~~Must have completed the following: AFM372~~
    - ~~Complete 1 of the following~~
      - ~~Must have completed at least 1 of the following:~~
        - ~~ACTSC231 - Introductory Financial Mathematics (0.50)~~
      - ~~Must have completed the following: ACTSC371~~
    - ~~Complete 1 of the following~~
      - ~~Must have completed the following:~~
        - ~~ACTSC372 - Investment Science and Corporate Finance (0.50)~~
      - ~~Must have completed the following: BUS 393W~~
  - **Complete 1 of the following**
    - **Must have completed the following:**
      - **ACTSC372 - Investment Science and Corporate Finance (0.50)**
    - **Must have completed the following: BUS393W**
  - Must have completed at least 1 of the following:
    - STAT333 - Stochastic Processes 1 (0.50)
    - STAT334 - Probability Models for Business and Accounting (0.50)
  - Enrolled in H-Actuarial Science, JH-Actuarial Science, H-Biostatistics, H-Math/FARM - Chartered Financial Analyst Spec, H-Math/FARM - Professional Risk Management Spec, H-Mathematical Finance, H-Statistics, JH-Statistics, or Statistics Minor

Corequisites

No Rules

Antirequisites

- Complete all of the following
  - Not completed nor concurrently enrolled in:
    - AFM322 - Derivative Securities (0.50)
    - ECON372 - Business Finance 2 (0.50)
    - MATBUS470 - Derivatives (0.50)
  - Not completed nor concurrently enrolled in: BUS423W

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

ANTIREQUISITES

- ECON 372 - Business Finance 2 — View Courses
- AFM 322 - Derivative Securities — View Courses
- MATBUS 470 - Derivatives — View Courses

COREQUISITES

- ACTSC 455 - Life Contingencies 3 — View Courses

COURSE REQUIREMENTS (NO UNITS)

- JH-Actuarial Science - Actuarial Science (Joint Honours) — View Programs
- H-Mathematical Finance - Mathematical Finance (Bachelor of Mathematics - Honours) — View Programs
- H-Math/FARM - Chartered Financial Analyst Spec - Mathematics/Financial Analysis and Risk Management - Cha... — View Programs
- H-Math/FARM - Professional Risk Management Spec - Mathematics/Financial Analysis and Risk Management - ... — View Programs
- H-Actuarial Science - Actuarial Science (Bachelor of Mathematics - Honours) — View Programs

AMATH 242
Introduction to Computational Mathematics

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
11363

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
1

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval

Rationale for Change
In general, for any CS courses that have CS 116 as a prerequisite, CS added (CS 114 with at least 60% and one of CS 115, CS 135, CS145)) as an alternative prerequisite to CS 116. They wish to do the same for CS 371. The additional requirement of (one of CS 115, CS 135, CS145) is because CS 116 transitively requires one of these as a prerequisite while CS 114 does not.

Approved at UAC on 20240527
Approved at FC on 20241022

Consultations
School of Computer Science.

Supporting Documentation

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

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

Undergraduate Communication Requirement Identifier
No

Components
LaboratoryLecture

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 (0.50)

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)~~
    - ~~CS138 - Introduction to Data Abstraction and Implementation (0.50)~~
    - ~~CS146 - Elementary Algorithm Design and Data Abstraction (Advanced Level) (0.50)~~
  - **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**
      - **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:**
        - **CS115 - Introduction to Computer Science 1 (0.50)**
        - **CS135 - Designing Functional Programs (0.50)**
        - **CS145 - Designing Functional Programs (Advanced Level) (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

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

ANTIREQUISITES

- CS 370 - Numerical Computation — View Courses
- CS 335 - Computational Methods in Business and Finance — View Courses

COURSE LISTS

- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours) — View Programs

COURSE REQUIREMENTS (NO UNITS)

- H-Biostatistics - Biostatistics (Bachelor of Mathematics - Honours) — View Programs
- H-Computer Science (BMath) - Computer Science (Bachelor of Mathematics - Honours) — View Programs
- H-Statistics - Statistics (Bachelor of Mathematics - Honours) — View Programs
- H-Mathematical Optimization - Operations Research Specialization - Mathematical Optimization - Operations Re... — View Programs
- H-Applied Mathematics with Scientific Computing - Applied Mathematics with Scientific Computing (Bachelor of... — View Programs
- ACTSC-Finance Specialization - Finance Specialization — View Programs
- H-Mathematical Optimization - Business Specialization - Mathematical Optimization - Business Specialization (B... — View Programs
- H-Mathematical Finance - Mathematical Finance (Bachelor of Mathematics - Honours) — View Programs
- JH-Applied Mathematics - Applied Mathematics (Joint Honours) — View Programs
- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours) — View Programs
- H-Mathematical Physics (BMath) - Mathematical Physics (Bachelor of Mathematics - Honours) — View Programs
- Quantum Information Option - Quantum Information Option — View Programs
- H-Computational Mathematics - Computational Mathematics (Bachelor of Mathematics - Honours) — View Programs
- Computational Mathematics Minor - Computational Mathematics Minor — View Programs

PREREQUISITES

- CS 479 - Neural Networks — View Courses
- AMATH 342 - Computational Methods for Differential Equations — View Courses
- CS 475 - Computational Linear Algebra — View Courses
- ACTSC 447 - Numerical Computation for Financial Modelling — View Courses
- CS 476 - Numerical Computation for Financial Modelling — View Courses
- CS 484 - Computational Vision — View Courses

AMATH 391
Data Analysis with Fourier and Wavelet Methods

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Title
- Abbreviated Title
- Description
- Prerequisites
- Effective Term and Year

Show All ▼

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
12282

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
1

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
09/18/2024

Rationale for Change
The new title and description better describe the current contents and emphasis of the course.

In 2010-2011, ECE 207 and ECE 342 were two courses offered under the title "Signals and Systems". This was replaced in 2011-2012 by the single course ECE 207. ECE has confirmed those courses are the same and that the change was made to reflect the course moving from the 3A to the 2B term. AMATH 391's prerequisite was never updated, which we now correct.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations
ECE through Eng ADUG Jason Grove September 2024.

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Subject Code
AMATH

Number
391

Course Level
300

Proposed
Title
Data Analysis with Fourier and Wavelet Methods

Existing
Title
From Fourier to Wavelets

Proposed
Abbreviated Title
Data Analysis:Fourier/Wavelets

Existing
Abbreviated Title
From Fourier to Wavelets

Proposed

Description

Fourier and wavelet methods are fundamental tools in data analysis ranging from time-series data to image and audio compression. These methods are increasingly finding application in areas such as machine learning and quantum computing alongside traditional application areas such as signal processing for images and audio. This course covers the mathematical development of Fourier and wavelet analysis, with an emphasis on both theory and practical application. Students will learn the necessary theory to apply Fourier and wavelet methods to the analysis of a variety of practical problems with hands on coding experience through a number of assignments.

Existing

Description

An introduction to contemporary mathematical concepts in signal analysis. Fourier series and Fourier transforms (FFT), the classical sampling theorem and the time-frequency uncertainty principle. Wavelets and multiresolution analysis. Applications include oversampling, denoising of audio, data compression, and singularity detection.

Units

0.50

Undergraduate Communication Requirement Identifier

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
    - ~~Complete 1 of the following~~
        - ~~Must have completed at least 1 of the following:~~
            - ~~AMATH231 - Calculus 4 (0.50)~~
            - ~~PHYS364 - Mathematical Physics 1 (0.50)~~
            - ~~SYDE252 - Linear Systems and Signals (0.50)~~
        - ~~Must have completed the following: ECE342~~
    - **Must have completed at least 1 of the following:**
        - **AMATH231 - Calculus 4 (0.50)**
        - **PHYS364 - Mathematical Physics 1 (0.50)**
        - **SYDE252 - Linear Systems and Signals (0.50)**
        - **ECE207 - Signals and Systems (0.50)**
    - Must have completed at least 1 of the following:
        - 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)
        - SYDE114 - Matrices and Linear Systems (0.25)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path

Committee approvals

Faculty/AFIW Path(s) for Workflow

Faculty of Mathematics

Dependencies

Dependent Courses and Programs/Plans

COURSE REQUIREMENTS (NO UNITS)

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

AMATH 451
Introduction to Dynamical Systems

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
3354

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
1

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
09/18/2024

Rationale for Change
Requisites have been changed to adapt to the content of the new differential equations curriculum in the AMATH courses.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations
Engineering ADUG Jason Grove approved change on 2024-10-30 in context of Neural Engineering Specialization.

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Subject Code
AMATH

Number
451

Course Level
400

Title
Introduction to Dynamical Systems

Abbreviated Title
Intro to Dynamical Systems

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

Undergraduate Communication Requirement Identifier
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 the following:~~
  - ~~AMATH351 - Ordinary Differential Equations (0.50)~~
- **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

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans
COURSE REQUIREMENTS (NO UNITS)
Neural Engineering Specialization - Neural Engineering Specialization View Programs

AMATH 453
Partial Differential Equations 2

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
3355

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
1

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
09/18/2024

Rationale for Change
This is part of the changes to the overall differential equations curriculum. Prerequisites have been changed to adapt to the new content of previous differential equations courses.

AMATH 250 and 251 are themselves possible prerequisites for the prerequisite AMATH 353, but note that they appear in a list of 6 courses (pick one of AMATH 250, AMATH 251, ECE 205, MATH 211, MATH 218 or MATH 228). The other four courses are not considered adequate prerequisite for AMATH 453. Additionally, AMATH 250 and 251 do cover the material necessary for AMATH 453 that was covered in AMATH 351.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Subject Code
AMATH

Number
453

Course Level
400

Title
Partial Differential Equations 2

Abbreviated Title
Partial Diff Equations 2

Description
A thorough discussion of the class of second order linear partial differential equations with constant coefficients, in two independent variables. Laplace's equation, the wave equation and the heat equation in higher dimensions. Theoretical/qualitative aspects: well-posed problems, maximum principles for elliptic and parabolic equations, continuous dependence results, uniqueness results (including consideration of unbounded domains), domain of dependence for hyperbolic equations. Solution procedures: elliptic equations -- Green functions, conformal mapping; hyperbolic equations -- generalized d'Alembert solution, spherical means, method of descent; transform methods -- Fourier, multiple Fourier, Laplace, Hankel (for all three types of partial differential equations); Duhamel's method for inhomogeneous hyperbolic and parabolic equations.

Units
0.50

Undergraduate Communication Requirement Identifier
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:
    - ~~AMATH351 - Ordinary Differential Equations (0.50)~~
    - AMATH353 - Partial Differential Equations 1 (0.50)
  - **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

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans
There are no dependencies

AMATH 455
Control Theory

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career
Undergraduate

Important!

Quest Course ID
3356

Proposed
Effective Term and Year
Fall 2025

Offering Number
1

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval

Rationale for Change
This is part of the overall changes to our differential equations curriculum. Prerequisites have been changed to reflect the new content of our ODEs courses.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Subject Code
AMATH

Number
455

Course Level
400

Title
Control Theory

Abbreviated Title
Control Theory

Description
Feedback control with applications. System theory in both time and frequency domain, state-space computations, stability, system uncertainty, loopshaping, linear quadratic regulators, and estimation.

Units
0.50

Undergraduate Communication Requirement Identifier
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:~~
    - ~~AMATH351 - Ordinary Differential Equations (0.50)~~
  - **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)**
  - Must have completed at least 1 of the following:
    - AMATH332 - Applied Complex Analysis (0.50)
    - PMATH332 - Applied Complex Analysis (0.50)
    - PMATH352 - Complex Analysis (0.50)

Corequisites
No Rules

Antirequisites
No Rules

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

COURSE REQUIREMENTS (NO UNITS)

- Engineering Specialization - Engineering Specialization — View Programs
- H-Computational Mathematics - Computational Mathematics (Bachelor of Mathematics - Honours) — View Programs
- Computational Mathematics Minor - Computational Mathematics Minor — View Programs

CS 371
Introduction to Computational Mathematics

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- participants
- Prerequisites
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career ?
Undergraduate

Important! ?

Quest Course ID
11363

Proposed
Effective Term and Year ?
Fall 2025

Offering Number
2

Existing
Effective Term and Year ?
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
05/08/2024

Rationale for Change
Prequisites for CS371: Add (CS 114 with a grade of at least 60% and (CS 115 or CS 135 or CS 145)) as an alternative to CS 116 in the prerequisites of CS 371.

Rationale: CS 114 covers similar material as CS 116. Other courses with CS 116 as a prerequisite have the same alternative prerequisite.

Approved at UAC on 20240527
Approved at FC on 20241022

Consultations

Supporting Documentation

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

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

Undergraduate Communication Requirement Identifier
No

Components
LaboratoryLecture

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 (0.50)

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)~~
    - ~~CS138 - Introduction to Data Abstraction and Implementation (0.50)~~
    - ~~CS146 - Elementary Algorithm Design and Data Abstraction (Advanced Level) (0.50)~~
  - **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**
      - **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:**
        - **CS115 - Introduction to Computer Science 1 (0.50)**
        - **CS135 - Designing Functional Programs (0.50)**
        - **CS145 - Designing Functional Programs (Advanced Level) (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

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

ANTIREQUISITES

CS 370 - Numerical Computation	View Courses
ECE 204 - Numerical Methods	View Courses
CS 335 - Computational Methods in Business and Finance	View Courses

COURSE LISTS

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

COURSE REQUIREMENTS (NO UNITS)

H-Biostatistics - Biostatistics (Bachelor of Mathematics - Honours)	View Programs
H-Computer Science (BMath) - Computer Science (Bachelor of Mathematics - Honours)	View Programs
H-Statistics - Statistics (Bachelor of Mathematics - Honours)	View Programs
H-Mathematical Optimization - Operations Research Specialization - Mathematical Optimization - Operations Re...	View Programs
H-Applied Mathematics with Scientific Computing - Applied Mathematics with Scientific Computing (Bachelor of...	View Programs
ACTSC-Finance Specialization - Finance Specialization	View Programs
H-Mathematical Optimization - Business Specialization - Mathematical Optimization - Business Specialization (B...	View Programs
H-Mathematical Finance - Mathematical Finance (Bachelor of Mathematics - Honours)	View Programs
H-Mathematics/Teaching - Mathematics/Teaching (Bachelor of Mathematics - Honours)	View Programs
JH-Applied Mathematics - Applied Mathematics (Joint Honours)	View Programs
H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours)	View Programs
H-Mathematical Physics (BMath) - Mathematical Physics (Bachelor of Mathematics - Honours)	View Programs
Quantum Information Option - Quantum Information Option	View Programs
H-Computational Mathematics - Computational Mathematics (Bachelor of Mathematics - Honours)	View Programs
Computational Mathematics Minor - Computational Mathematics Minor	View Programs

PREREQUISITES

CS 479 - Neural Networks	View Courses
AMATH 342 - Computational Methods for Differential Equations	View Courses
CS 475 - Computational Linear Algebra	View Courses
ACTSC 447 - Numerical Computation for Financial Modelling	View Courses
CS 476 - Numerical Computation for Financial Modelling	View Courses
CS 488 - Introduction to Computer Graphics	View Courses
CS 484 - Computational Vision	View Courses

CS 453
Software and Systems Security

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Antirequisites
- Effective Term and Year
- participants

Effective Date & Career

Career
Undergraduate

Important!

Quest Course ID
16619

Proposed
Effective Term and Year
Fall 2025

Offering Number
1

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
09/11/2024

Rationale for Change
Between the time the course was approved by UAC (March 2023) and when it first was possible to teach it (Fall 2024), the School of CS offered the same course as a topics course with subject "Software and Systems Security" (S23, W24, W25). Students who took that topics course should not be able to also take CS 453. Though most students who took the topics course will likely have graduated by Fall 2025, there is a possibility that a few won't have.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations

Supporting Documentation

Course Information

Faculty
Faculty of Mathematics

Academic Unit
David R. Cheriton School of Computer Science

Subject Code
CS

Number
453

Course Level
400

Title
Software and Systems Security

Abbreviated Title
Software & Systems Security

Description
Introduction to security issues in modern software, operating systems, and other computing platforms (e.g., mobile and cloud environments). Causes of security breaches and methods to help detect, isolate, and prevent them. Specific topics include comparing security and privacy, program security, operating system security, mobile security, hardware security, administrating security, and legal and ethical issues.

Units
0.50

Undergraduate Communication Requirement Identifier
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)
  - 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
No Rules

Antirequisites

- **Not completed nor concurrently enrolled in: CS489 (Topic 26: Software and Systems Security)**

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

COURSE LISTS

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

COURSE REQUIREMENTS (NO UNITS)

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

CS 459
Privacy, Cryptography, Network and Data Security

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Antirequisites
- Effective Term and Year
- participants

Effective Date & Career

Career
Undergraduate

Important!

Quest Course ID
16620

Proposed
Effective Term and Year
Fall 2025

Offering Number
1

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
09/11/2024

Rationale for Change
Between the time the course was approved by UAC (March 2023) and when it first was possible to teach it (Fall 2024), the School of CS offered the same course as a topics course with subject "Privacy, Cryptography, Network and Data Security" (S23, W24, W25). Students who took that topics course should not be able to also take CS 459. Though most students who took the topics course will likely have graduated by Fall 2025, there is a possibility that a few won't have.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations

Supporting Documentation

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

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

Undergraduate Communication Requirement Identifier
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

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

Antirequisites

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

Course Notes

Fee Statement

Notes

Workflow Information

Workflow Path
Committee approvals

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

Dependencies

Dependent Courses and Programs/Plans

COURSE LISTS

- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours) — View Programs

COURSE REQUIREMENTS (NO UNITS)

- SE-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization — View Programs
- CS-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization — View Programs
- CS-Software Engineering Specialization - Software Engineering Specialization — View Programs

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

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
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Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Declaration Requirements
- participants
- Effective Term and Year
- Admin Notes

Effective Date and Career

Career
Undergraduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
06/28/2024

Quality Assurance Designation
Minor Modification

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

Rationale and Background for Change(s)
To declare the plan, students who do not have a SMAV are required to have completed at least 10 courses with a minimum cumulative average of 70% and no failures. The "no failure requirement" is viewed as too restrictive (in addition to creating confusion among students regarding their eligibility to declare the plan). Additionally, it is viewed as a deterrent for potential students to declare an ACTSC plan. As such, the proposal is to remove the "no failure" requirement from the declaration requirements in an effort to increase enrolment in the plan.

Simultaneously, we propose to remove the mention "Actuarial Science is a restricted-enrolment plan" in the declaration requirements. We acknowledge that this will result in us admitting all students who apply and meet the declaration requirements, but this has already been our practice in the department. The department has the capacity to accommodate these requests, as demonstrated by the fact that we have not been utilizing the current “restricted-enrolment plan” to refuse students.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Statistics and Actuarial Science

Field of Study
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

Online Degree/Diploma

Admissions

Admissions Entry Point
Declare Plan

Proposed

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 special major average (SMAV) of 70.0%; or if a SMAV 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.

Existing

Declaration Requirements

- Actuarial Science is a restricted-enrolment plan.
- 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 special major average (SMAV) of 70.0%; or if a SMAV does not yet exist a minimum cumulative average of 70.0% on at least 10 courses, and no failed courses (i.e., no grades below 50.0%, or DNWs, or WFs).
- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations
Yes

List of Invalid Combinations
H-Data Science (BCS)H-Data Science (BMath)

Average Requirement

Yes

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative special 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

0
Units to Complete

No Rules

Course Requirements (no units)

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)
    - MTHEL131 - Introduction to Actuarial Practice (0.50)
    - STAT330 - Mathematical Statistics (0.50)
    - STAT331 - Applied Linear Models (0.50)
    - STAT333 - Stochastic Processes 1 (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:
    - ENGL378 - Professional Communications in Statistics and Actuarial Science (0.50)
    - MTHEL300 - Professional Communications in Statistics and Actuarial Science (0.50)
  - Complete 1 of the following:
    - MATH237 - Calculus 3 for Honours Mathematics (0.50)
    - MATH247 - Calculus 3 (Advanced Level) (0.50)
  - Complete 1 of the following:
    - STAT340 - Stochastic Simulation Methods (0.50)
    - STAT341 - Computational Statistics and Data Analysis (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)
      - STAT441 - Statistical Learning - Classification (0.50)
      - STAT443 - Forecasting (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/MTHEL300.
    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.

Notes

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

Workflow Information

Change to Undergraduate Communication Requirement
No

Workflow Path
Committee approvals

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

Senate Workflow
--

Dependencies

Dependent Courses and Programs/Plans

ANTIREQUISITES

- ECON 372 - Business Finance 2 — View Courses
- ACTSC 221 - Introductory Financial Mathematics (Non-Specialist Level) — View Courses

PREREQUISITES

- ACTSC 453 - Basic Pension Mathematics — View Courses
- ACTSC 455 - Life Contingencies 3 — View Courses
- ACTSC 468 - Readings in Actuarial Science 1 — View Courses
- ACTSC 469 - Readings in Actuarial Science 2 — View Courses
- ACTSC 489 - Advanced Topics in Actuarial Science — View Courses
- AFM 476 - Corporate Financial Decision Making — View Courses
- ACTSC 471 - Corporate Financial Decision Making — View Courses
- ACTSC 331 - Life Contingencies 2 — View Courses
- ACTSC 363 - Casualty and Health Insurance Mathematics 1 — View Courses
- ACTSC 362 - Introduction to Property and Casualty Practice — View Courses
- ACTSC 431 - Casualty and Health Insurance Mathematics 2 — View Courses
- ACTSC 432 - Credibility and Risk Theory — View Courses
- ACTSC 445 - Quantitative Enterprise Risk Management — View Courses
- ACTSC 446 - Mathematics of Financial Markets — View Courses
- ACTSC 454 - Longevity and Mortality Using Predictive Analytics — View Courses
- ENGL 378 - Professional Communications in Statistics and Actuarial Science — View Courses
- MTHEL 300 - Professional Communications in Statistics and Actuarial Science — View Courses

SPECIALIZATION IS AVAILABLE FOR STUDENTS IN THE FOLLOWING MAJORS

- ACTSC-Predictive Analytics Specialization - Predictive Analytics Specialization — View Programs
- ACTSC-Finance Specialization - Finance Specialization — View Programs

JH-Actuarial Science
Actuarial Science (Joint Honours)

Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Effective Term and Year
- Declaration Requirements
- participants

Effective Date and Career

Career
Undergraduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Fall 2023

Proposal Details

Proposal Type
Change

Academic Unit Approval
06/28/2024

Quality Assurance Designation
Minor Modification

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

Rationale and Background for Change(s)
To declare the plan, students who do not have a SMAV are required to have completed at least 10 courses with a minimum cumulative average of 70% and no failures. The "no failure requirement" is viewed as too restrictive (in addition to creating confusion among students regarding their eligibility to declare the plan). Additionally, it is viewed as a deterrent for potential students to declare an ACTSC plan. As such, the proposal is to remove the "no failure" requirement from the declaration requirements in an effort to increase enrolment in the plan.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Statistics and Actuarial Science

Field of Study
Actuarial Science

Faculty
Faculty of Mathematics

Undergraduate Credential Type
Major

Program Type
Joint Honours

Program/Plan Name
Actuarial Science (Joint Honours)

Systems of Study
Co-operative
Regular

Online Degree/Diploma

Admissions

Admissions Entry Point
Declare Plan

Proposed

Declaration Requirements

- Must be combined with at least one other major or joint major (Bachelors of Mathematics).
- To declare Joint Honours 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 special major average (SMAV) of 70.0%; or, if a SMAV 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.

Existing

Declaration Requirements

- Must be combined with at least one other major or joint major (Bachelors of Mathematics).
- To declare Joint Honours 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 special major average (SMAV) of 70.0%; or if a SMAV does not yet exist a minimum cumulative average of 70.0% on at least 10 courses, and no failed courses (i.e., no grades below 50.0%, or DNWs, or WFs).
- Before declaring this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations
Yes

List of Invalid Combinations
H-Data Science (BCS)H-Data Science (BMath)

Average Requirement
Yes

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative special 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 (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

0
Units to Complete

No Rules

Course Requirements (no units)

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)
        - MTHEL131 - Introduction to Actuarial Practice (0.50)
        - STAT330 - Mathematical Statistics (0.50)
        - STAT333 - Stochastic Processes 1 (0.50)
    - Complete 1 of the following:
        - ENGL378 - Professional Communications in Statistics and Actuarial Science (0.50)
        - MTHEL300 - Professional Communications in Statistics and Actuarial Science (0.50)
    - Complete 1 of the following:
        - MATH237 - Calculus 3 for Honours Mathematics (0.50)
        - MATH247 - Calculus 3 (Advanced Level) (0.50)
    - Complete 1 additional ACTSC course at the 400-level

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/MTHEL300.
    4. BUS393W for ACTSC372.
2. STAT334 is not an acceptable substitute for STAT330 or STAT333.

Notes

Specializations

Specializations for this Major
No

Workflow Information

Change to Undergraduate Communication Requirement
No

Workflow Path	Faculty/AFIW Path(s) for Workflow	Senate Workflow
Committee approvals	Faculty of Mathematics	--

Dependencies

Dependent Courses and Programs/Plans

ANTIREQUISITES

- ECON 372 - Business Finance 2 — View Courses
- ACTSC 221 - Introductory Financial Mathematics (Non-Specialist Level) — View Courses

PREREQUISITES

- ACTSC 453 - Basic Pension Mathematics — View Courses
- ACTSC 455 - Life Contingencies 3 — View Courses
- ACTSC 468 - Readings in Actuarial Science 1 — View Courses
- ACTSC 469 - Readings in Actuarial Science 2 — View Courses
- ACTSC 489 - Advanced Topics in Actuarial Science — View Courses
- AFM 476 - Corporate Financial Decision Making — View Courses
- ACTSC 471 - Corporate Financial Decision Making — View Courses
- ACTSC 331 - Life Contingencies 2 — View Courses
- ACTSC 363 - Casualty and Health Insurance Mathematics 1 — View Courses
- ACTSC 362 - Introduction to Property and Casualty Practice — View Courses
- ACTSC 431 - Casualty and Health Insurance Mathematics 2 — View Courses
- ACTSC 432 - Credibility and Risk Theory — View Courses
- ACTSC 445 - Quantitative Enterprise Risk Management — View Courses
- ACTSC 446 - Mathematics of Financial Markets — View Courses
- ACTSC 454 - Longevity and Mortality Using Predictive Analytics — View Courses
- ENGL 378 - Professional Communications in Statistics and Actuarial Science — View Courses
- MTHEL 300 - Professional Communications in Statistics and Actuarial Science — View Courses

Engineering Specialization
Engineering Specialization
Under Review | Fall 2025

Proposal Information

Status
Active

Workflow Status
In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲
Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- Course Requirements (no units)
- Effective Term and Year
- Admin Notes

Effective Date and Career

Career
Undergraduate

Important!

Proposed
Effective Term and Year
Fall 2025

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Academic Unit Approval
09/18/2024

Quality Assurance Designation
Minor Modification

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

Rationale and Background for Change(s)
GENE 123 is often full when our students request enrolment for the Engineering specialization. It has been common to accept ECE 140 as an alternative. We would like to make the substitution formal.

Also proposing the correction of a typo in the title of Theme 3: Heat~~h~~ and Mass Transfer.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations (Departmental)
Consultation and approval from Mahesh Tripunitara (ECE) - September 25, 2024.

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Field of Study
Applied Mathematics

Faculty
Faculty of Mathematics

Undergraduate Credential Type
Specialization

Program/Plan Name

Engineering Specialization

Admissions

Specialization is available for students in the following majors

- H-Applied Mathematics

Admissions Entry Point

Declare Plan

Declaration Requirements

Enrolment in this Specialization is limited; a minimum cumulative average of 70% is strongly recommended.

Requirements Information

Invalid Combinations

No

Average Requirement

No

Graduation Requirements

- Complete the required courses for one theme described below.
    - Theme 1: Complete a total of 6.0 units.
    - Theme 2: Complete a total of 5.0 units.
    - Theme 3: Complete a total of 4.5 units.

Course Requirements (units)

Required Courses

0
Units to Complete

No Rules

Course Requirements (no units)

Required Courses

- Complete 1 of the following

  Theme 1: Fluids and Heat
    - Complete all of the following
        - Complete all the following:
            - AMATH271 - Introduction to Theoretical Mechanics (0.50)
            - AMATH361 - Continuum Mechanics (0.50)
            - AMATH463 - Fluid Mechanics (0.50)
            - ~~GENE123 - Electrical Circuits and Instrumentation~~ ~~(0.50)~~

        - ME219 - Mechanics of Deformable Solids 1 (0.50)
        - ME250 - Thermodynamics 1 (0.50)
        - ME353 - Heat Transfer 1 (0.50)
        - ME354 - Thermodynamics 2 (0.50)
        - ME456 - Heat Transfer 2 (0.50)
        - PHYS122 - Waves, Electricity and Magnetism (0.50)
    - **Complete 1 of the following:**
        - **ECE140 - Linear Circuits (0.50)**
        - **GENE123 - Electrical Circuits and Instrumentation (0.50)**
    - Complete 1 of the following:
        - CO250 - Introduction to Optimization (0.50)
        - CO255 - Introduction to Optimization (Advanced Level) (0.50)
        - STAT331 - Applied Linear Models (0.50)
        - STAT340 - Stochastic Simulation Methods (0.50)
    - Complete 1 of the following:
        - ME557 - Combustion 1 (0.50)
        - ME564 - Aerodynamics (0.50)
        - ME571 - Clean Air Technologies (0.50)

Theme 2: Communication and Control

- Complete all of the following
    - Complete all the following:
        - AMATH455 - Control Theory (0.50)
        - ECE207 - Signals and Systems (0.50)
        - ECE240 - Electronic Circuits 1 (0.50)
        - ECE318 - Communication Systems (0.50)
        - ECE380 - Analog Control Systems (0.50)
        - ~~GENE123 - Electrical Circuits and Instrumentation (0.50)~~
        - PHYS122 - Waves, Electricity and Magnetism (0.50)
    - **Complete 1 of the following:**
        - **ECE140 - Linear Circuits (0.50)**
        - **GENE123 - Electrical Circuits and Instrumentation (0.50)**
    - Complete 1 of the following:
        - CO250 - Introduction to Optimization (0.50)
        - CO255 - Introduction to Optimization (Advanced Level) (0.50)
        - CS475 - Computational Linear Algebra (0.50)
        - STAT331 - Applied Linear Models (0.50)
        - STAT340 - Stochastic Simulation Methods (0.50)
    - Complete 2 of the following:
        - ECE313 - Digital Signal Processing (0.50)
        - ECE484 - Digital Control Applications (0.50)
        - ECE486 - Robot Dynamics and Control (0.50)
        - SYDE544 - Biomedical Measurement and Signal Processing (0.50)
        - SYDE572 - Introduction to Pattern Recognition (0.50)

~~Theme 3: Heath and Mass Transfer~~ Theme 3: Heat and Mass Transfer

- Complete all of the following
    - Complete all the following:
        - AMATH361 - Continuum Mechanics (0.50)
        - AMATH463 - Fluid Mechanics (0.50)

- CHE230 - Physical Chemistry 1 (0.50)
- CHE231 - Physical Chemistry 2 (0.50)
- CHE312 - Mathematics of Heat and Mass Transfer (0.50)
- CHE313 - Applications of Heat and Mass Transfer (0.50)
- CHE330 - Chemical Engineering Thermodynamics (0.50)

- Complete 2 of the following:
  - CHE314 - Chemical Reaction Engineering (0.50)
  - CHE331 - Electrochemical Engineering (0.50)
  - CHE341 - Introduction to Process Control (0.50)
  - CHE361 - Bioprocess Engineering (0.50)
  - CHE522 - Advanced Process Dynamics and Control (0.50)

Course Lists

Required Courses

No Rules

Are there cross-listed courses listed in requirements?
No

Additional Constraints

1. Theme 1:
   1. ME courses can be used to fulfil the subject concentration requirement of the Honours Applied Mathematics academic plan.
   2. AMATH361 and AMATH463 can be used to satisfy the AMATH courses at the 300- or 400-level requirement of the Honours Applied Mathematics academic plan.
2. Theme 2:
   1. ECE and SYDE courses can be used to fulfil the subject concentration requirement of the Honours Applied Mathematics academic plan.
   2. AMATH455 can be used to satisfy the AMATH courses at the 300- or 400-level requirement of the Honours Applied Mathematics academic plan.
3. Theme 3:
   1. CHE courses can be used to fulfil the subject concentration requirement of the Honours Applied Mathematics academic plan.
   2. AMATH361 and AMATH463 can be used to satisfy the AMATH courses at the 300- or 400-level requirement of the Honours Applied Mathematics academic plan.

Notes

Workflow Information

Workflow Path	Faculty/AFIW Path(s) for Workflow	Senate Workflow
Committee approvals	Faculty of Mathematics	--

Dependencies

Dependent Courses and Programs/Plans

SPECIALIZATIONS LIST

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

Computing Minor
Computing Minor

Revision | Under Review | Fall 2025

Proposal Information

Workflow Status

In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand

Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Changes

- List of Invalid Combinations
- participants

Effective Date and Career

Career

Undergraduate

Important!

Effective Term and Year

Fall 2025

Proposal Details

Proposal Type

Change

Academic Unit Approval

09/11/2024

Quality Assurance Designation

Minor Modification

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
Yes

Invalid Combinations Consultations
E-mail consultations with Mahesh Tripunitara (ECE Associate Chair Undergraduate Studies), Jason Grove (Engineering Associate Dean Undergraduate Studies), and Derek Rayside took place in May 2024. They agreed with the proposed invalid combinations.

Rationale and Background for Change(s)
There is a large conceptual overlap between the Computing Minor and these Options from the Faculty of Engineering: Computer Engineering Option, Software Engineering Option, and Computing Option.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Mathematics

Academic Unit
David R. Cheriton School of Computer Science

Field of Study
Computer Science

Faculty
Faculty of Mathematics

Undergraduate Credential Type
Minor

Program/Plan Name
Computing Minor

Admissions

Admissions Entry Point

Declare Plan

Declaration Audience

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

Declaration Requirements

- Before requesting admission to this academic plan, see invalid credential combinations.

Requirements Information

Invalid Combinations

Yes

Proposed

List of Invalid Combinations

Bioinformatics OptionComputer Science Minor
H-Computer Science (BCS)H-Computer Science (BMath)
JH-Computer Science (BCS)JH-Computer Science (BMath)
H-Computing & Financial ManagementH-Data Science (BCS)
H-Information Technology ManagementH-Software Engineering
H-Data Science (BMath)Computer Engineering Option
Software Engineering OptionComputing Option

Existing

List of Invalid Combinations

Bioinformatics OptionComputer Science Minor
H-Computer Science (BCS)H-Computer Science (BMath)
JH-Computer Science (BCS)JH-Computer Science (BMath)
H-Computing & Financial ManagementH-Data Science (BCS)
H-Information Technology ManagementH-Software Engineering
H-Data Science (BMath)

Average Requirement

Yes

Minimum Average(s) Required

- A minimum cumulative CS average of 60.0%.

Graduation Requirements

- Complete all the required courses listed below.

Course Requirements (units)

Required Courses

0
Units to Complete

No Rules

Course Requirements (no units)

Required Courses

- Complete all of the following
  - Complete 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)
  - Complete 1 of the following
    - Complete 1 of the following:
      - CS114 - Principles of Computing for Science (0.50)
      - CS116 - Introduction to Computer Science 2 (0.50)
    - Complete all the following:
      - CS136 - Elementary Algorithm Design and Data Abstraction (0.50)
      - CS136L - Tools and Techniques for Software Development (0.25)
    - Complete all the following:
      - CS146 - Elementary Algorithm Design and Data Abstraction (Advanced Level) (0.50)
      - CS136L - Tools and Techniques for Software Development (0.25)
  - Complete 1 of the following
    - Complete 1 CS course at the 200-, 300-, or 400-level
    - Complete all the following:
      - COMM432 - Electronic Business (0.50)
  - Complete 1 additional CS course at the 100-, 200-, 300-, or 400-level
  - Complete 3 additional CS courses at the 200-, 300-, or 400-level
  - Complete 1 additional CS course at the 300- or 400-level
  - The following cannot be used towards this academic plan:
    - CS399 - Readings in Computer Science (0.50)
    - CS499R - Readings in Computer Science (0.50)
    - CS499T - Honours Thesis (0.50)

Course Lists

Required Courses

No Rules

Are there cross-listed courses listed in requirements?
No

Additional Constraints

Notes

Undergraduate Plan Guidelines

Adherence to Academic Plan Guidelines
Yes

Workflow Information

Workflow Path
Committee approvals

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

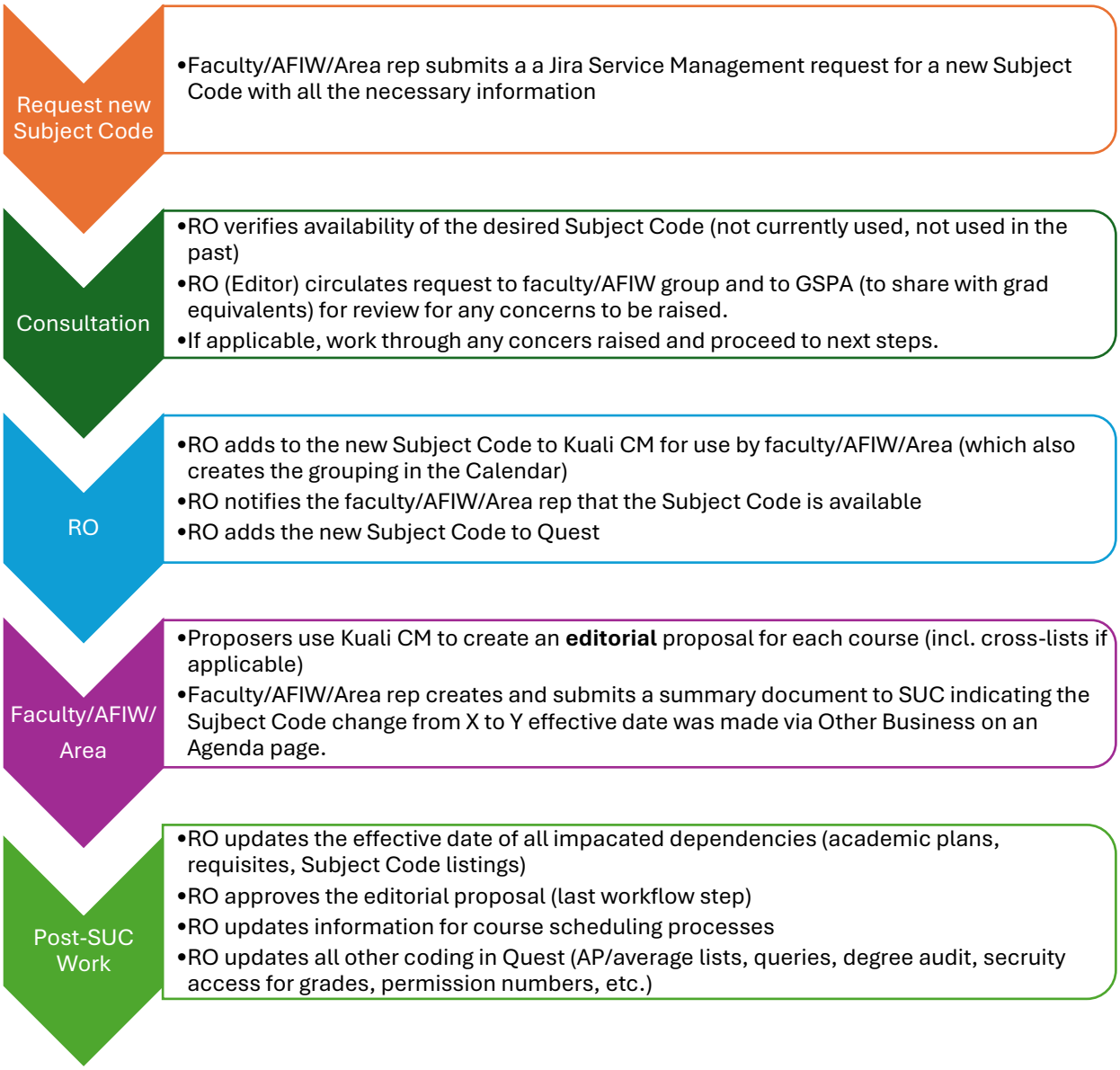
Senate Workflow
--

Dependencies

Dependent Courses and Programs/Plans
There are no dependencies

UG process to create a new Subject Code (change from existing)

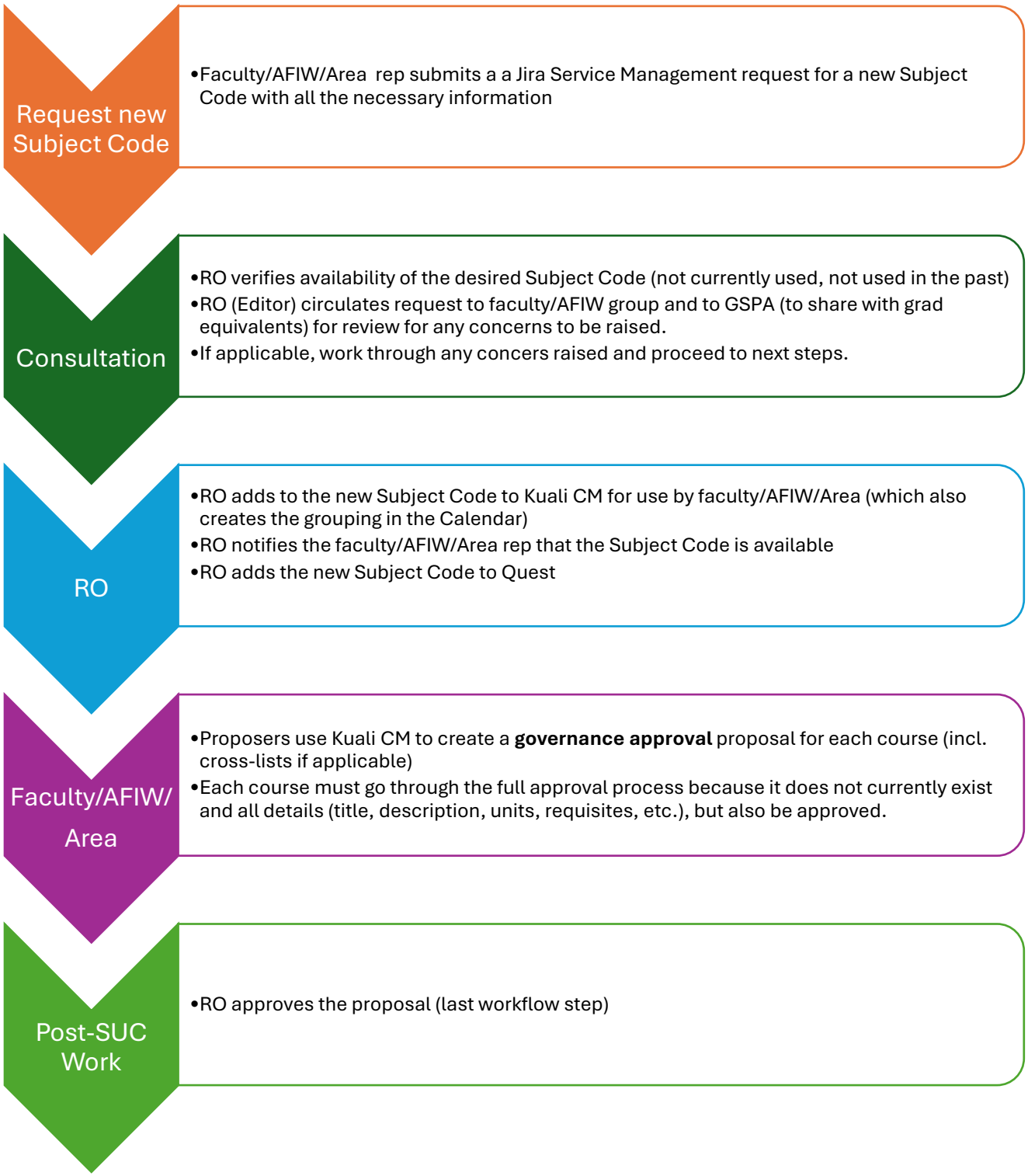
This is the process used when a new subject code needs to be created that will replace an existing subject code (e.g., RS to RCS, or DRAMA to THPERF).



Note for Steps 3 & 4: Once the new code is approved to move forward (after the consultation phase is complete), the better order is to have the SUC motion on the record first and then finish processing the courses in the RO, but the work can happen simultaneously. A large part will **depend on SUC meeting timing**. Course proposals can begin to be prepared as soon as the subject coded is available in the system.

UG process to create a new Subject Code (new area)

This is the process used when a new subject code needs to be created that will be used to create a brand new area of study (e.g., BLKST or HHUM).



SUC – 2024-11-19 – Consent Agenda – Registrar's Office

Meeting Information

Agenda Page Title
SUC – 2024-11-19 – Consent Agenda – Registrar's Office

Career Level
Undergraduate

Faculty/Unit
Registrar's Office

Date
11/19/2024

Time
1 p.m.

Location
NH 3318

Summary

- Regulations:
  - Assessments: Academic Considerations and Accommodations > adding FLD component to list of restricted components for self-declaration short-term absences to the calendar for winter 2025 term.

Other Business

- Academic dates for 2025-2026 (joint submission with graduate studies - see attached PDF)

Attachment(s)

- 2025-2026 Academic Calendar Dates - for SUC.pdf

Course Proposals

Course Proposal Details

Courses: Retire
No proposals have been added.

Courses: New
No proposals have been added.

Courses: Changes
No proposals have been added.

Programs & Plans Proposals

Programs & Plans Proposal Details

Programs & Plans: Retire
No proposals have been added.

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

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

Regulations Proposals

Regulations Proposal Details

Regulations: Retire
No proposals have been added.

Regulations: New
No proposals have been added.

Regulations: Changes

Code	Title	Type	Workflow Step
UG-AR-Assessments: Accommodations	Assessments: Academic Considerations and Accommodations	Policy	SUC Subcommittee, SUC Curricular Subcommittee | Under Review

UG-AR-Assessments: Accommodations
Assessments: Academic Considerations and Accommodations

Under Review | Winter 2025

Proposal Information

Status
Active

Workflow Status
In Progress
SUC Subcommittee, SUC Curricular Subcommittee expand
Waiting for Approval | Approval Delegate(s)

- Tim Weber-Kraljevski
- Mike Grivicic
- Diana Goncalves
- Kuali - Arts
- Kuali - Env
- Melanie Figueiredo
- Kuali - Math
- Kuali - Eng
- Kuali - Hlth
- Ashley Day
- Kuali - Science

Changes

- Regulation Details
- participants
- Effective Term and Year
- Admin Notes

Effective Date & Career

Career
Undergraduate

IMPORTANT!

Proposed
Effective Term and Year
Winter 2025

Existing
Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change

Rationale and Background
The proposal is to further restrict the self-declaration of a short-term absence by excluding courses with the component of Field Studies (FLD).

- FLD components are typically offered as block courses (compressed time-frame courses) with elements that cannot be easily accommodated with alternate means.
- The impact of missing days (through the self-declaration of a short-term absence) is that a significant amount of teaching and learning time is missed that, in most cases, cannot be repeated.
- FLD courses frequently have multi-day off-site work, and instructors can't be expected to be responsible for students who elect to take a couple of days off (there are already other accommodations for illness); we don't need to promote taking days off. Take the scenario of a one week field course to the UK, and a student decides that they could get Taylor Swift tickets for a London date in there, so they self-declare a 2-day absence to leave and go to the concert. Or want to hang out on the beach for a couple of days in Costa Rica, etc.

An effective date of January 1, 2025 is being sought so that the change can be in place for spring 2025 when the majority of block courses and field courses occur. The Course Selection Period for spring 2025 will occur late January 2025/early February 2025. This change will appear as an addenda in the 2024-25 UG Calendar on January 1/25.

Supporting Documentation

General Regulation Information

Type of Regulation
University-wide

Regulation Grouping
Academic Regulations

Regulation Page Name
Assessments: Academic Considerations and Accommodations

Description
considerations and accommodation guidelines (illness, religious observances, final exam conflict, short-term absence, extenuating circumstances, athletic events, bereavement, disability).

Regulation Details

Proposed

Regulation Details

Students' ability to complete some component of a course may be affected by short-term extenuating circumstances or long-term or chronic medical conditions (physical or mental). For short-term extenuating circumstances, the term **academic consideration** is applicable and provides students with consistent, fair, and pedagogically appropriate consideration, without compromising the academic integrity of the course or program. Short-term extenuating circumstances might include common illness and ailments such as a cold or flu, minor injuries, compassionate/personal/wellness needs (unrelated to a disability/condition), bereavement, and participation in University of Waterloo sanctioned academic or athletic events that prevent them from meeting academic obligations.

In comparison, the term **academic accommodations** are modifications or adjustments to the way a student receives course curriculum and materials, participates in course activities, or demonstrates knowledge of course content and skills. Reasonable accommodations reduce or eliminate barriers in the academic environment but are not intended to alter the fundamental purpose or essential requirements of the academic program, milestone, or course. The University has a legal duty to accommodate students on a variety of grounds protected from discrimination including disability (which includes physical and mental health related conditions), creed, family status, and sex (including pregnancy and breast feeding).

Whether through academic consideration or academic accommodation, the University supports and upholds the duty to accommodate, and provides support to students who are experiencing extenuating circumstances.

Elective arrangements (such as travel plans) are not considered acceptable grounds for granting an academic consideration. Students who have long-term or chronic medical conditions (physical or mental) which may impede their ability to complete academic responsibilities are directed to seek academic accommodations through AccessAbility Services.

Academic Considerations

Academic Considerations for Short-Term Absences

Students may require a short-term absence from their academic responsibilities for any reason. For academic obligations during the Formal Lecture Period, students may self-declare a short-term absence within the student information system (Quest) using the Self-Declaration of Absence Form. Self-declared short-term absences will not be accepted for the course/class components of Clinic (CLN), Field Studies (FLD), Laboratory (LAB), and Studio (STU).

Students will be permitted one short-term absence declaration per academic term. Thereafter, the student will be required to submit a University of Waterloo Verification of Illness Form (VIF) or register for academic accommodations with AccessAbility Services (depending on the nature of the reasons for the absence).

A self-declared short-term absence will excuse students from their academic responsibilities for up to two consecutive calendar days. It applies to all courses (but not to CLN, FLD, LAB, or STU components, as noted above). There is no expectation that a self-declared short-term absence be total; that is, students may elect to participate in any course and complete any course element despite not being required to.

During the two-day academic consideration period, the instructor cannot require completion of any academic responsibilities. Students must contact the instructor no later than 24 hours after the missed assessment(s). If possible, students should contact the instructor prior to the expected missed assessment(s).

Academic Considerations Due to Illness

When students experience common, short-term illness and require academic consideration, they are required to provide a University of Waterloo Verification of Illness Form (VIF), following the faculty-specific process for their home faculty, if any one of the following is true:

- Absence is not covered by short-term academic consideration.
- Student has used their maximum permissible one self-declared short-term absence previously during the term.
- Student is retroactively reporting an illness.
- Student is seeking academic consideration due to illness for an academic assessment that falls outside the Formal Lecture Period.

Students should seek medical treatment and provide confirmation of the illness within 48 hours of the missed academic obligation by submitting a completed University of Waterloo Verification of Illness Form (VIF) to support requests for academic consideration due to illness.

The University of Waterloo Verification of Illness Form (VIF) is normally the only medical documentation accepted to support requests for academic consideration. Students who consult their physician or nurse practitioner or use the services of an off-campus walk-in clinic must provide this form to the attending physician for completion; notes and forms created by the physician or clinic are normally not acceptable. Medical documentation that contains the same information specified on the University of Waterloo Verification of Illness Form (VIF) may be accepted, though the University is not compelled to accept it. Health Services charges a fee for competing the University of Waterloo Verification of Illness Form (VIF) that is not covered by OHIP/UHIP. Fees for this service or those levied by off-campus practitioners are the student's responsibility.

False claims of illness and/or the submission of false supporting documentation of extenuating circumstances constitute an academic offence that may result in disciplinary action under Policy 71 (Student Discipline).

Adjustments of due dates or deferrals of term terms or final examinations are not automatic upon the presentation of acceptable medical documentation. Documentation along with all other information available will be considered when determining whether academic consideration is warranted.

Students experiencing illnesses or injuries that impact their ability to access and participate in their academics are encouraged to register with AccessAbility Services to explore the need for academic accommodations.

Academic Considerations Due to Final Examination Schedule Conflicts

A **final examination conflict** is when two final examinations that are scheduled on the same day, at the same time.

The University strives to create a conflict-free final examination schedule.

If students have a a final examination conflict with a Wilfrid Laurier University final examination that has been detected during the final examination scheduling process, the Office of the Registrar will notify the academic unit/instructor.

If students have an examination conflict that was not detected during the final examination scheduling process, they are required to complete the Final Examination Timetable Conflict Form. The Office of the Registrar will confirm the conflict then notify the academic unit/instructor.

Academic units/instructors who have been notified of confirmed final examination conflicts will determine alternative final examination arrangements and contact the impacted students to discuss the alternatives.

The University strives to schedule final examinations with:

- No student scheduled to write two final examinations in a row (i.e., back-to-back periods).
- No student writing in the last period on one day and the first period in the next day.

Where this cannot be accomplished for a particular student, the University provides final examination relief by making alternative scheduling arrangements for that student, by shifting one final examination period giving the student an additional hour break. Students can elect to accept final examination combinations that violate these constraints. In doing so, they understand that petitions or appeals based on a violation of the above conflicts will not be granted.

Guidelines for Providing Academic Considerations

University of Waterloo instructors provide academic considerations when appropriate conditions are met (see the criteria above).

When instructors are asked to consider student's extenuating circumstances, the options available to students vary based on the nature of the extenuating circumstances/events they are facing, on the kind of assessment they are unable to complete on time, and the instructor's own grading practices stated in the course outline.

- **For in-term assignments (assignments, poster symposia, presentations, etc.):** Instructors may use an alternative such as extension or transfer of weight to a subsequent assessment or test/examinations. Details shall be included in the course outline.
- **For in-term tests and midterm examinations:** The weighting of the missed test is normally added to the final examination or spread over the remaining tests. In-term tests are normally not deferred (unless there are no remaining tests to transfer weight to).
- **For final examinations:** The final examination may be deferred. Normally, it is to be written at a time mutually agreed by the student and instructor that is as soon after the missed examination as possible; in any case it is to be written no later than the student's next academic term in which a) the student has an academic term, and b) the course is offered.
- **For WaterlooWorks arranged co-op interviews:** Employers may follow up with the student, but the University cannot require an employer to reschedule the interview.

Any University academic activity that appears in the Schedule of Classes will be given precedence over alternate arrangements in the resolution of an academic consideration.

Any unresolved disputes between instructors and students regarding the legitimacy of extenuating circumstances or the suitability of academic considerations will be decided by the appropriate associate dean(s). When in doubt, students should approach the associate dean from their home faculty. For students taught at the Affiliated and Federated Institutions of Waterloo where there is no associate dean, the dean exercises these responsibilities.

Academic Accommodations

Accommodations due to Disability

The University of Waterloo is committed to upholding the rights of persons with disabilities and creating accessible and inclusive learning environments for all. AccessAbility Services is the University's centralized office for the management of academic accommodations for all students with known or suspected disabilities and disabling conditions (injuries, medical conditions, and impacts of trauma). Students seeking academic accommodations as a result of disability/disabling conditions will register with AccessAbility Services to determine eligibility for academic accommodations, and to develop an academic accommodation plan as required. AccessAbility Services will relay the accommodation plan to instructors, and will work with the instructor and the student to ensure an appropriate accommodation plan is implemented. Disability covers a broad range and degree of conditions that can be permanent, temporary, sporadic, and suspected, including, but not limited to, physical disabilities, learning disabilities, developmental disabilities, mental health disabilities, medical conditions, and the physical, emotional, and psychological effects of trauma (e.g., sexual violence, discrimination, or oppression).

Refer to the Student Academic Accommodation Guidelines for more information on eligibility for academic accommodations, the process for registering with AccessAbility Services, and for information on roles and responsibilities in the accommodation process.

Academic Accommodations due to Creed/Religion

The University acknowledges that, due to the pluralistic nature of the University community, some students may seek academic accommodations on religious grounds.

Students can complete the Religious Observance Self-Declaration Form in Quest, which will inform their instructors of the potential conflict for certain dates. As the dates of important religious observances are generally known well in advance, students must consult with their instructor(s) within two weeks of the announcement of the due date or scheduled examination date for which academic accommodation is being sought. The self-declaration form for short-term absences may also be used by students requiring an absence of two days or less during the Formal Lecture Period.

Academic Accommodations due to Other Code Grounds

Students seeking an academic accommodation related to a protected ground (e.g., creed, family status, and sex, including pregnancy and breastfeeding) should inform their instructor/academic unit as soon as they become aware of the need.

Existing

Regulation Details

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Academic Accommodations

Accommodations due to Disability

The University of Waterloo is committed to upholding the rights of persons with disabilities and creating accessible and inclusive learning environments for all. AccessAbility Services is the University's centralized office for the management of academic accommodations for all students with known or suspected disabilities and disabling conditions (injuries, medical conditions, and impacts of trauma). Students seeking academic accommodations as a result of disability/disabling conditions will register with AccessAbility Services to determine eligibility for academic accommodations, and to develop an academic accommodation plan as required. AccessAbility Services will relay the accommodation plan to instructors, and will work with the instructor and the student to ensure an appropriate accommodation plan is implemented. Disability covers a broad range and degree of conditions that can be permanent, temporary, sporadic, and suspected, including, but not limited to, physical disabilities, learning disabilities, developmental disabilities, mental health disabilities, medical conditions, and the physical, emotional, and psychological effects of trauma (e.g., sexual violence, discrimination, or oppression).

Refer to the Student Academic Accommodation Guidelines for more information on eligibility for academic accommodations, the process for registering with AccessAbility Services, and for information on roles and responsibilities in the accommodation process.

Academic Accommodations due to Creed/Religion

The University acknowledges that, due to the pluralistic nature of the University community, some students may seek academic accommodations on religious grounds.

Students can complete the Religious Observance Self-Declaration Form in Quest, which will inform their instructors of the potential conflict for certain dates. As the dates of important religious observances are generally known well in advance, students must consult with their instructor(s) within two weeks of the announcement of the due date or scheduled examination date for which academic accommodation is being sought. The self-declaration form for short-term absences may also be used by students requiring an absence of two days or less during the Formal Lecture Period.

Academic Accommodations due to Other Code Grounds

Students seeking an academic accommodation related to a protected ground (e.g., creed, family status, and sex, including pregnancy and breastfeeding) should inform their instructor/academic unit as soon as they become aware of the need.

Workflow Information

Change to Undergraduate Communication Requirement
No

Workflow Path	Faculty/AFIW Path(s) for Workflow	Senate Workflow
Committee approvals		--

Academic Calendar Dates, 2025-2026

	Fall 2025	Winter 2026	Spring 2026
Co-operative Work Term Begins	Sept. 2 (T)	Jan. 5 (M)	May 11 (M)
Classes Begin	Sept. 3 (W)	Jan. 5 (M)	May 11 (M)
Holidays	Oct. 13 (M)	Feb. 16 (M) Apr. 3 (F)	May 18 (M) July 1 (W) Aug. 3 (M)
Reading Week	Oct. 11-19 (S-U)	Feb. 14-22 (S-U)	N/A
Convocation	Oct. 24, 25 (F,S)	N/A	June 16-20 (T-S)
Classes End	Dec. 2 (T)	Apr. 6 (M)	August 5 (W)
Make-up Day(s) for in-term holidays	N/A	Apr. 6 (M) for Apr. 3 (F schedule)	Aug. 4 (T) for May 18 (M schedule) Aug. 5 (W) for July 1 (W schedule)
Pre-Examination Study Day(s)	Dec. 3, 4 (W, R)	Apr. 7, 8 (T,W)	Aug. 6 (R)
Examinations Begin	Dec. 5 (F)	Apr. 9 (R)	Aug. 7 (F)
In-Person Exam Days for Online Courses	Dec. 5, 6 (F,S) Dec. 10, 13 (W,S)	Apr. 10, 11 (F,S) Apr. 15, 18 (W,S)	Aug. 7, 8 (F,S) Aug. 12, 15 (W,S)
Examinations on Sunday	Dec. 7 (U)	N/A	N/A
No Exams on the Following Days	Dec. 14 (U)	April 12 (U) Apr. 19 (U)	Aug. 9 (U) Aug. 16 (U)
Examinations End (including Emergency Day)	Dec. 19 (F)	Apr. 24 (F)	Aug. 20 (R)
Co-operative Work Term Ends	Dec. 19 (F)	Apr. 24 (F)	Aug. 21 (F)
Teaching days	60	60	60
Pre-examination Study Day(s)	2	2	1
Examination days	13 (+1 Emergency Day)	13 (+1 Emergency Day)	11 (+1 Emergency Day)

Symbols and abbreviations:

(M) Monday, (T) Tuesday, (W) Wednesday, (R) Thursday, (F) Friday, (S) Saturday, (U) Sunday, N/A – Not Applicable

Guidelines for Determining Academic Calendar of Dates

The following are principles and guidelines either formally agreed upon by Senate or adopted as common practice in determining the dates for the academic year.

1. That the practice of setting dates for each academic year continues to be an annual exercise.

2. That there be no fewer than 60 teaching days (12 weeks) in a term. A clear rationale for fewer than 60 teaching days must be communicated to Senate at the time calendar dates are approved. In calculating teaching days in a term, Saturdays, Sundays, and statutory or University holidays are excluded.

3. That attention be given to balancing the number of meets in courses. Where an imbalance may occur because of statutory holidays, the class schedule for a day different than the calendar day can be used to balance the number of course meets.

4. That Fall Convocation be the Friday and Saturday that fall in the third full week (beginning Sunday) of October.

5. That Spring Convocation be the Tuesday to Saturday in the second full week (beginning Sunday) in June.

6. That the Reading Weeks occur in all Faculties in the fall and winter terms. They must begin on the Saturday before the public holidays of Thanksgiving Day and Family Day and will end on the following Sunday.

7. That Fall Term classes in September begin on the Wednesday following the Labour Day holiday.
   Exception: The Fall Term begins on Tuesday, September 8th when Labour Day is September 7th.

8. That the start date for Winter Term be set as follows:
   - If January 1st is a Sunday, then start of classes is Monday, January 9th.
   - If January 1st is a Monday, then start of classes is Monday, January 8th.
   - If January 1st is a Tuesday, then start of classes is Monday, January 7th.
   - If January 1st is a Wednesday, then start of classes is Monday, January 6th.
   - If January 1st is a Thursday, then start of classes is Monday, January 5th.
   - If January 1st is a Friday, then start of classes is Monday, January 11th.
   - If January 1st is a Saturday, then start of classes is Monday, January 10th.

9. The start date for Spring Term be set as follows:
   - If May 1st is a Sunday, then start of classes is Monday, May 9th.
   - If May 1st is a Monday, then start of classes is Monday, May 8th.
   - If May 1st is a Tuesday, then start of classes is Monday, May 7th.

- If May 1st is a Wednesday, then start of classes is Monday, May 6th.
- If May 1st is a Thursday, then start of classes is Monday, May 5th.
- If May 1st is a Friday, then start of classes is Monday, May 11th.
- If May 1st is a Saturday, then start of classes is Monday, May 10th.

10. That there be no fewer than one pre-examination study day and when possible, two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of examinations. A clear rationale for using fewer than 2 days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

11. That there be no fewer than 13 examination days in the Fall and Winter Terms, and 11 examination days in the Spring Term. In addition, one Emergency Day with no scheduled examinations is added to the end of the examination period.

12. In calculating examination days, Saturdays which fall within the period are included, whereas Sundays and statutory or University holidays are excluded.
    Exceptions:

    Examinations will not be scheduled on the Saturday following Good Friday when that day falls within the examination schedule or the Saturday of the Civic Day weekend.

    The first Sunday within the examination period may be used when required to accommodate the prescribed number of examination days in the Fall Term.

13. That in the Fall Term no examinations be scheduled beyond December 22nd. The Emergency Day cannot be scheduled beyond December 23rd.

14. That Online Course Examination Days in each term be the first consecutive Friday and Saturday and the second consecutive Wednesday and Saturday in the examination period.

15. Grades due dates for on campus courses that have a scheduled final examination are normally scheduled seven days from the date of the final examination. Grades for online courses that have a scheduled final examination are due on the last day of the grades submission period. Grades for all courses without a scheduled final examination are normally due 14 days after the start of examinations.

16. Co-op work terms are expected to be 16 week in duration. Actual start and end dates may vary depending on employer or student requirements in consultation with Co-operative Education.

Rules that Require Exceptions with Rationale:

Rule 10
…That there be no fewer than one pre-examination study day and when possible, two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of examinations. A clear rationale for using fewer than 2 days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

In order to accommodate Online Course Examination Days early in the spring term exam schedule to ensure that grades from online courses are submitted before or on the deadline, only one study day is possible for the 2026 spring term.

Rule 12
… The first Sunday within the examination period may be used when required to accommodate the prescribed number of examination days in the Fall Term.

With fall term classes beginning September 3, 2025, and the scheduling of two study days prior to the fall final exam period, the first Sunday within the exam period was required for scheduling exams to accommodate the prescribed number of examination days.

Prepared by:
C. Newell Kelly, Registrar
July 2024

NEW OR RENEWED UNDERGRADUATE AWARDS

for inclusion in the Undergraduate Awards Database

- submitted for November 19, 2024 meeting of Senate Undergraduate Council -

ENTRANCE AWARDS

Buzzi Family Engineering Entrance Bursary
A bursary, valued at $2,000, will be awarded annually to a full-time undergraduate student enrolling in Year One of any program in the Faculty of Engineering (excluding Architecture) on the basis of demonstrated financial need, as determined by Waterloo. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. This fund is made possible by a donation from Peter Buzzi (BASc '82) to support the next generation of engineers at Waterloo.

Method of Financing: annual donation (five-year pledge)

Catherine Campbell Scholarship
A scholarship, valued at $2,000, will be awarded annually to a full-time undergraduate student entering Year One of the Mathematics/Chartered Professional Accountancy program in the Faculty of Mathematics. Selection will be based on academic excellence as determined from the admission average, Admission Information Form, and contest scores as assessed through the Centre for Education in Mathematics and Computing (CEMC). No application is required. This fund is made possible by a donation from Catherine Campbell (BMath '80).

Method of Financing: renewal of annual donation (five-year pledge)

Lee Chan Chiou Entrance Award
An award, valued at $10,000, will be provided annually to a full-time undergraduate student entering Year One of any program in the Faculty of Science (excluding Science/Biotechnology-CPA), on the basis of academic achievement and demonstrated financial need as determined by Waterloo. To be considered, student must complete the University of Waterloo Entrance Bursary application by April 15. This fund is made possible by a generous donation from Richard, Jenny, and Brenda Lee to support passionate science students in their first year.

Method of Financing: annual donation (five-year pledge)

CIBC Inclusion Award for Black Students
Four renewable awards, valued at up to $25,000 each (paid over eight academic terms) will be provided annually to Black undergraduate students entering Year One of any full-time degree program at the University of Waterloo, with preference to students enrolling in a STEM program (Science, Technology, Engineering or Mathematics). Selection will be based on a combination of academic achievement, extracurricular and/or volunteer involvement, as well as a statement wherein students are asked to describe what receiving this award would mean to them in their pursuit of post-secondary studies. Interested students must complete the Application for Entrance Awards Designated to Black Students by April 15. Recipients will receive $3,125 per academic term for up to eight terms (1A-4B). Payments beyond Year One are dependent on maintaining a minimum overall cumulative average of 70% and full-time enrolment in a degree program. CIBC has established these awards to empower the next generation of leaders and changemakers from Black communities to improve access to education.

Method of Financing: annual donation (five-year pledge)

Class of 1988 Mechanical Engineering "BatMech" Scholarship
A scholarship, valued at up to $1,300, will be provided annually to a full-time undergraduate student entering Year One of the Mechanical Engineering program. This scholarship is made possible by donations from "BatMech", a class that supported each other's accomplishments and valued comradery and academic success equally. They created this award in hopes that future class leaders will strive to create a positive and memorable experience for their fellow classmates.

Method of Financing: endowment

Class of 1997 Civil Engineering Entrance Scholarship
A scholarship, valued at up to $1,200, will be awarded annually to a full-time undergraduate student entering Year One of the Civil Engineering program. This fund is made possible by a donation from the Civil Engineering Class of 1997 to support future civil engineering talent at the University of Waterloo as they begin their studies.

Method of Financing: endowment

Faculty of Science Contest Award
An award, valued at $1,000 each, will be provided to eligible students entering Year One of a full-time undergraduate degree program in the Faculty of Science at the University of Waterloo (UW) (excluding Aviation, Optometry, and Pharmacy) who have completed one of the following UW-managed contests: Sir Isaac Newton Contest, CHEM13 News Contest, or the Euclid Math Contest. Eligible students may receive one Contest Award only. Admitted students will be provided with details on how to claim this award when they receive an Offer of Admission.

Method of Financing: Faculty funds

Faculty of Science Entrance Scholarships
Scholarships, ranging in value from $500 - $2,000 each, will be awarded to students entering Year One of a full-time undergraduate degree program in the Faculty of Science at the University of Waterloo (excluding Aviation, Optometry, and Pharmacy). Selection is based on the admission average as follows: $2,000 (95%+), $1,500 (90-94.9%), $1,000 (85-89.9%), $500 (80-84.9%). No application is required.

Method of Financing: Faculty funds

Faculty of Science International Student Renewable Scholarships
Up to 10 scholarships, valued at up to $80,000 each (paid over eight academic terms), will be awarded to international students entering Year One of any full-time undergraduate degree program in the Faculty of Science at the University of Waterloo in Fall 2025. Selection is based on a combination of academic excellence (must meet minimum admission average by program) and application statements wherein students are asked to describe the impact this award will have on their pursuit of post-secondary studies and what motivates them to become a Scientist. Interested students will be asked to complete an online application form. The application deadline is February 14, 2025. Scholarships recipients will receive $10,000 per academic term for up to eight terms (1A-4B), contingent on full-time enrolment in degree studies in the Faculty of Science and subject to paying international tuition fees. Payments after Year One are also dependent on maintaining an 80% overall cumulative average each term.

Method of Financing: Faculty funds

Faculty of Science International Student Entrance Scholarships
Up to 5 scholarships, valued at $25,000 each, will be awarded to international students entering Year One of any full-time undergraduate degree program in the Faculty of Science at the University of Waterloo. Selection is based on a combination of academic excellence (must meet minimum admission average by program) and application statements wherein students are asked to describe the impact this award will have on their pursuit of post-secondary studies and what motivates them to become a Scientist. Interested students will be asked to complete an online application form. The application deadline is February 14, 2025. These scholarships are for first year only and will be divided and paid in equal instalments in the 1A and 1B study terms. Payments are contingent on full-time enrolment in degree studies in the Faculty of Science and subject to paying international tuition fees.

Method of Financing: Faculty funds

Kothari Family Entrance Scholarship
Two scholarships, valued at $20,000 each, are provided annually to outstanding students entering Year One of any program in the Faculty of Engineering. This generous donation is made possible by Anupam and Vishal Kothari, proud Waterloo Engineering alumni, to recognize student achievements and attract exceptional students to Waterloo Engineering.

Method of Financing: annual donation (four-year pledge)

Lam Entrance Award in Engineering
Two awards, each valued at $10,000, will be provided annually to full-time undergraduate students entering Year One of any program in the Faculty of Engineering (excluding the School of Architecture). Selection will be based on demonstrated financial need, as determined by Waterloo, combined with academic excellence and extracurricular achievements as assessed through the Admission Information Form (AIF) and the online interview. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. This fund is made possible by John Lam (BASc '99, Electrical Engineering) and his wife Xiaoxu Du (BASc '00, Computer Engineering) to remove financial barriers, and invest in the future generation of engineering talent.

Method of Financing: one-time donation (to support award for three years)

Miller Engineering Opportunity Scholarship
A scholarship, valued at up to $15,000, will be awarded annually to a full-time undergraduate student entering Year One of any program in the Faculty of Engineering (excluding the School of Architecture). Preference will be given to students from West Niagara Secondary School or the Niagara region. This fund is made possible by a donation from Engineering alum, Robert C. Miller (BASc ’70) to support engineering students as they begin their studies at the University of Waterloo and take the first step to a career in engineering.

Method of Financing: endowment

Andrea Myles Memorial Bursary in Engineering
A bursary, valued at $2,000, will be provided annually to a full-time student who identifies as a woman enrolling in Year One of any program in the Faculty of Engineering, wherein women are underrepresented, with preference to Electrical Engineering. Selection will be based on demonstrated financial need as determined by Waterloo. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. This fund is made possible by a donation from Strik, Baldinelli, and Moniz Ltd. in memory of Andrea Myles.

Method of Financing: annual donation (five-year pledge)

Anton Pietsch Entrance Award in Mathematics
An award, valued at up to $1,200, will be provided annually to a full-time undergraduate student enrolled in Year One of any program in the Faculty of Mathematics. Selection is based on academic excellence and a demonstrated financial need as determined by Waterloo. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. The Admission Information Form (AIF) and contest scores, as assessed through the Centre for Education in Mathematics and Computing (CEMC), will also be considered. This fund is made possible by a donation from Kelvin Thermal Energy, Inc (“KTE”) in memory of Anton Pietsch, who was a gifted applied science, engineering, and computing professional and possessed a broad technical, deep cross-disciplinary scientific experience.

Method of Financing: endowment

Red Lane Group Entrance Scholarship in Engineering
A scholarship, valued at $20,000, will be provided annually to a full-time undergraduate student entering Year One of any program in the Faculty of Engineering (excluding the School of Architecture). This fund is made possible by a donation from Waterloo Engineering alumni Vishal Kothari (BASc '97 Electrical Engineering), Lucas Skoczkowski (BASc '97 Electrical Engineering), and Rubens Rahim (BASc '97 Computer Engineering), through their company, Red Lane Group, to recognize student achievements and attract exceptional students to Waterloo Engineering.

Method of Financing: annual donation (five-year pledge)

RJC Engineering Entrance Bursary
A bursary, valued at $20,000, will be awarded annually to a full-time undergraduate student enrolling in Year One of any program in the Faculty of Engineering (excluding Architecture) on the basis of demonstrated financial need, as determined by Waterloo. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. This fund is made possible by a donation from an engineering alumnus, in honour of his father, who believed that higher education was invaluable in improving the individual and through them, the community.

Method of Financing: annual donation (five-year pledge)

Science SHSM Entrance Award
Awards, valued at $1,000 each, will be provided to students entering Year One of any full-time undergraduate degree program in the Faculty of Science at the University of Waterloo (excluding Aviation, Optometry, and Pharmacy). Selection is based completion of any Specialist High Skills Major at an Ontario high school. No application is required.

Method of Financing: Faculty funds

Shoukry Saleh Memorial Scholarship for Management Engineering
A scholarship, valued at up to $10,500, will be awarded annually to a full-time undergraduate student entering Year One of the Management Engineering program. This fund is made possible by a donation from Elias Mulamoottil and Krista Saleh to celebrate the legacy of Professor Shoukry Saleh, a founding professor of the Department of Management Science and Engineering, to encourage excellence within the Management Engineering program.

Method of Financing: endowment

Stratford School GBDA Entrance Award
An award, valued at up to $10,000, paid in two equal instalments in Year One and Two, will be provided annually to an undergraduate student entering first year of the Global Business and Digital Arts program. Selection is based on demonstrated financial need, as determined by Waterloo. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15.

Method of Financing: general donations to School of GBDA (undetermined pledge period)

Cindy Tse and Jeremy Pee Entrance Award in Engineering
An award, valued at approximately $1,500, will be provided annually to a full-time undergraduate student entering Year One of any program in the Faculty of Engineering. Selection will be based on demonstrated financial need, as determined by Waterloo, combined with academic excellence and extracurricular achievements as assessed through the Admission Information Form (AIF) and the online interview. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. This fund is made possible by a donation from Jeremy Pee (BASc '99, Mechanical Engineering), and his wife Cindy C. Tse (BA '98, Psychology), in support of the next generation of engineering talent at Waterloo Engineering.

Method of Financing: endowment

Rick Vender Mechanical Engineering Bursary
A bursary, valued at approximately $1,500, will be awarded annually to a full-time undergraduate student entering Year One of Mechanical Engineering on the basis of financial need. To be considered, students must complete the University of Waterloo Entrance Bursary application by April 15. This fund has been established by Rick Vender (BASc '78, Mechanical Engineering), to support the next generation of aspiring mechanical engineers.

Method of Financing: endowment

AWARDS FOR CURRENT STUDENTS

Sheila Ager Scholarship
A scholarship, valued at $1,200, will be awarded annually to a full-time undergraduate student enrolled in Year Two of any program in the Faculty of Arts, excluding Global Business and Digital Arts and Accounting and Financial Management. Selection is based on academic excellence. This scholarship honours Sheila Ager, for her dedicated service as Dean of Arts (2019-2024).

Method of Financing: Faculty funds until endowment is established

Bateman-Minello Award
An award, valued at $10,000, will be provided to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the Faculty of Engineering. Selection is based on positive contributions to the 2SLGBTQ+ community through extracurricular or volunteer involvement. Interested students should submit an application by October 1. This fund is made possible by a donation from the Bateman Minello Family Foundation to support and celebrate the 2SLGBTQ+ community.

Method of Financing: one-time donation

Maksim Brawn Award for Women in Aviation
An award, valued at up to $5,000, will be presented annually to a full-time undergraduate student who identifies as a woman enrolled in Year Two, Three, Four of the Science and Aviation program in the Faculty of Science. Selection is based on academic excellence (minimum 75% cumulative average) and extracurricular involvement. Preference will be given to students making an effort to advance women in science and/or aviation. Interested students should submit an application by October 15. This fund is made possible by a donation from the Brawn family to encourage women pursuing an education in STEM.

Method of Financing: annual donation (four-year pledge)

Canadian Nuclear Laboratories (CNL) Undergraduate Engineering Scholarship
A scholarship, valued at $10,000, will be awarded annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the Faculty of Engineering (excluding the School of Architecture). Selection is based on academic excellence (minimum 80% cumulative average), combined with a demonstrated interest in the nuclear sector as shown through extracurricular involvement, research projects, co-op work terms, and special projects. Interested students should submit an application by October 1. This scholarship is made possible by Canadian Nuclear Laboratories (CNL) to foster the next generation of engineering talent for Canada's nuclear sector.

Method of Financing: annual donation (three-year pledge)

Canadian Nuclear Laboratories (CNL) Undergraduate Science Scholarship
A scholarship, valued at $5,000, will be awarded annually to a full-time undergraduate student enrolled in Year Three or Four of any program in the Faculty of Science. Selection is based on academic excellence (minimum 80% cumulative average), combined with a demonstrated interest in the nuclear sector as shown through their extracurricular involvement, research projects, co-op work terms, and special projects. Interested students should submit an application by October 15. This scholarship is made possible by Canadian Nuclear Laboratories (CNL) to foster the next generation of scientists for Canada's nuclear sector.

Method of Financing: annual donation (three-year pledge)

Carlisle Engineering Scholarship
A scholarship, valued at up to $1,500, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the Faculty of Engineering (excluding School of Architecture). Selection is based on academic excellence (minimum 80% cumulative average) combined with extracurricular involvement and/or participation in volunteer activities related to the field of engineering. Interested students should submit an application by October 1. This fund is made possible by a donation from Stephen Carlisle (BASc '86) to support future Waterloo engineers.

Method of Financing: endowment

Enova Power Electrical Engineering Scholarship
Two scholarships, valued at $3,000 each, are awarded annually to full-time undergraduate students enrolled in Year Three or Four of Electrical Engineering. Selection is to be based on academic excellence (minimum 80% cumulative average) and extracurricular involvement and participation in volunteer activities to make a positive contribution to society. Interested students should submit an application by July 15. This fund is made possible by a donation from Enova Power Corp. to encourage students to pursue studies in Electrical Engineering and explore career opportunities with electric utilities.

Method of Financing: annual donation (five-year pledge)

Norman Esch Entrepreneurship Award for Capstone Design
Several awards will be provided to student teams enrolled in the Faculty of Engineering's Fourth-Year Capstone Design Project. Six awards valued at $12,000 each for winning teams, and six awards valued at $5,000 each for second place teams. Students interested in participating in this award competition should submit a one-page Notice of Intent (https://uwaterloo.ca/conrad-school-entrepreneurship-business/undergraduate/awards/norman-esch-entrepreneurship-award). Details regarding the application process, business plan and template are available through the Conrad School of Entrepreneurship and Business. The award funds will be divided equally among the winning team members. This fund is made possible by donations from The Esch Foundation.

Method of Financing: annual donation (two-year pledge)

Norman Esch Enterprise Co-op Award
Nine awards, valued at up to $10,000 each, will be presented annually to full-time undergraduate students who are pursuing an enterprise co-op opportunity and are enrolled in the Faculty of Engineering. Selection will be based on academic achievement and demonstrated entrepreneurial outlook. Preference will be given to students who will not be receiving any other funding in support of entrepreneurial work experience and who are actively working on a technology/engineering-based venture. Interested students should apply to be accepted into the Enterprise Co-op no later than the start of the co-op term. They will be assessed for these awards as part of the e-launch process during the first week of the enterprise co-op term. This fund is made possible by a donation from The Esch Foundation, to expand opportunities for students to establish their own business as an alternative to a traditional co-op work term experience.

Method of Financing: annual donation (two-year pledge)

Norman Esch Bridging Entrepreneurs to Students (BETS) Award
Thirty stipends, valued at $1,000 each, are awarded annually to first-year, full-time undergraduate students in the Faculty of Engineering who have been unable to secure a co-op work term placement. This funding will provide students with an opportunity to work in a start-up company to increase their exposure to an entrepreneurial work culture. Preference will be given to students with financial need who are not receiving any other significant support. The Conrad School will select recipients through a competitive interview process after students have applied to the online job posting for the Bridging Entrepreneurs to Students. This happens after co-op interviews have ended and following final exams. This fund is made possible by a donation from The Esch Foundation.

Method of Financing: annual donation (two-year pledge)

David M. Fox Award in Mathematics and Computer Science
An award, valued at up to $1,500, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the Faculty of Mathematics. Selection is based on academic achievement (minimum cumulative average of 75%) combined with a demonstrated interest in becoming a teacher. Preference will be given to students enrolled in a Computer Science or a Mathematics/Teaching program. Interested students should submit an application by November 1. This fund is made possible by a donation from David M. Fox (BMath ’75), who is passionate about inspiring the next generation of mathematics and computer science students to pursue a career in teaching.

Method of Financing: endowment

GHD Foundation Engineering Bursary
A bursary, valued at $2,500, will be awarded annually to an undergraduate student enrolled in Year Three in the Faculty of Engineering who is from one of the following underrepresented groups: women students, Black students, or Indigenous students. Selection will be based on demonstrated financial need as determined by Waterloo. Candidates must have a minimum cumulative average of 75%. To be considered, students must complete the bursary application by the fall deadline. This fund is made possible by a donation from GHD Foundation.

Method of Financing: annual donation (four-year pledge)

Carl and Carol Haavaldsrud Memorial Award in Global Business and Digital Arts
An award, valued at up to $1,200, will be presented annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of the Global Business and Digital Arts program in the Stratford School of Interaction Design and Business. Selection is based on academic excellence (minimum 75% cumulative average) combined with demonstrated interest in the area of UX Design. Interested students should submit a two-page (maximum) letter demonstrating their interest in UX Design. This could include examples of course-work, extracurricular activities (i.e., UX Design Camps) and/or non-course work related to UX Design (i.e., products you have personally designed for projects outside of the classroom). Applications must be submitted to the GBDA Academic Administrative Supervisor for the Stratford School of Interaction Design and Business by February 15. This fund is made possible by a donation from alumni Heather Haavaldsrud and Chris DeBrusk in memory of Heather’s parents.

Method of Financing: endowment

Hogg Family Award in Accounting and Finance
An award, valued at $2,000, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the School of Accounting and Finance. Selection is based on academic achievement (minimum 70% cumulative average), combined with extracurricular involvement or interest in the areas of fintech, digital assets, and/or blockchain. Interested students should submit an application by October 1. This fund is made possible by a gift from Zac Hogg (BAFM ’14, MAcc ’15).

Method of Financing: annual donation (five-year pledge)

Sarah Inam Memorial Award
An award, valued at $2,000, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the Department of Economics in the Faculty of Arts. Selection is based on academic achievement (minimum 75% cumulative average) and demonstrated extracurricular involvement and/or participation in volunteer activities in the area of social justice. Interested students should submit an application by February 1. This fund is made possible by a donation from Omer Inam and the friends and family of Sarah Inam (BA ’05, MA ’07) in memory of her life and time at UWaterloo.

Method of Financing: annual donation (five-year pledge)

Haitham Kamil Undergraduate Award
An award, valued at $1,500, will be provided to a full-time undergraduate student enrolled in any year in any program at the University of Waterloo. Selection will be based on academic achievement (minimum 70% cumulative average) combined with involvement in cultural extracurricular activities and contributions to the Iraqi community. Interested students should apply by February 15. This fund is made possible by a donation from Haitham Kamil (MASc '84), a proud alum.

Method of Financing: annual donation (two-year pledge)

La Roche-Posay Dermatology Contest Award
An award, valued at $3,000, will be provided annually to a full-time undergraduate student enrolled in Year Three of the PharmD program in the School of Pharmacy. Selections are made on the basis of a compelling presentation or instructional tool for use by healthcare professionals on the role of non-prescription products in the management and/or treatment of patients with skin conditions. Each winter term, the School of Pharmacy will coordinate a dermatology contest to supplement material covered in PHARM 362 - Advanced Patient Self-Care. This award is funded by La Roche-Posay, who is actively supporting research in the clinical, biological, and pharmacological fields of dermatology.

Method of Financing: renewal of annual donation (five-year pledge)

Tung Lam Women in Computer Science Scholarship
Two scholarships, valued at $5,000 each, will be awarded annually to full-time undergraduate students who identify as women enrolled in Year Two, Three, or Four of any program in the David R. Cheriton of School of Computer Science, wherein women are underrepresented. Selection will be based on academic excellence (minimum cumulative average of 80%) and leadership potential as demonstrated through volunteerism on campus or in the community. Interested candidates should submit an application by November 1. This scholarship is made possible through a gift from Disney Lam (BMath '14), in honour of her father. This award stands as a tribute to his enduring legacy of instilling the values of creativity, long-term innovation, and calculated risk-taking in her.

Method of Financing: annual donation (five-year pledge)

Lemay Change Maker Award
An award, valued at $5,000, will be presented annually to a full-time undergraduate or graduate student enrolled in any year of the undergraduate or master's program in the School of Architecture in the Faculty of Engineering. Selection is based on excellence in design and/or design initiative with distinctively actionable potential to positively impact Canadian communities with architecture that is thought provoking, collaborative, and sustainable. Selection will consider all or some of the following categories: sustainability, transdisciplinary thinking, social value, and design excellence. Students interested in applying must submit an application form that can be found on the School of Architecture website, by the deadline advertised, normally each spring. This fund is made possible by a donation from Lemay Architects.

Method of Financing: annual donation (three-year pledge)

Ian MacNaughton Memorial Award
An award, valued at up to $2,000, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four in the School of Planning. Selection is based on academic achievement (minimum 70% cumulative average) combined with extracurricular and/or volunteer involvement. Preference will be given to students who have demonstrated involvement in the School of Planning and/or the planning profession. Interested students should submit an application by March 15. This fund is made possible by donations from MHBC, along with friends and family, in honour of Ian MacNaughton.

Method of Financing: endowment

Apostolos Marinakos Memorial Award in Engineering
An award, valued at up to $1,500, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of Electrical or Mechanical Engineering. Selection is based on academic achievement (minimum 70% cumulative average) combined with demonstrated interest in research, innovation or problem solving through participation on student teams, hackathons, research co-op positions with Faculty members, or similar experiences. Interested students should submit an application by October 1. This fund is made possible by a donation from Louie, Kathy, Andreas, and Stavros Marinakos, and the Apostolos Marinakos Memorial Foundation, in loving memory of their son, Apostolos Marinakos, a third-year Mechanical Engineering student at UW when he passed away in 2022. Apostolos is remembered for his ingenious mind, generous heart, innovative spirit, and kindness and unwavering support that touched the hearts and lives of his friends and colleagues during his time at UW.

Method of Financing: endowment

Pratt & Whitney Canada Mechanical Engineering Award
Two awards, valued at $4,000 each, will be provided to full-time undergraduate students enrolled in Year Three or Four of the Mechanical Engineering program. Selection to be based on academic excellence (minimum 80% cumulative average) combined with significant leadership on a student design team or in other extracurricular activities. Interested students should submit an application by February 1. This fund is made possible by a donation from Pratt & Whitney Canada to support excellence in the future of mechanical engineering.

Method of Financing: one-time donation

George and Cathy Raithby Award for Entrepreneurship
An award, valued at up to $2,800, will be provided annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the Faculty of Engineering. Selection is based on academic achievement (minimum 70% cumulative average), combined with a demonstrated passion for entrepreneurship as evidenced through courses, business ideas, or completion of a business project. Preference will be given to candidates who can best demonstrate how their idea will positively impact Canada. Interested students should submit an application by October 1. This fund is made possible by a donation from George and Cathy Raithby to support entrepreneurial-minded engineering students in achieving their goals.

Method of Financing: endowment

George and Cathy Raithby Award for Indigenous Students
An award, valued at $1,500, is available annually for an Indigenous undergraduate or graduate student enrolled in any year or Faculty at the University of Waterloo. To be considered, students must have completed the Indigenous Verification section in Quest and have had their Indigenous identity verified by the Office of Indigenous Relations. Selection will be based on demonstrated connection and/or contributions to Indigenous communities through extracurricular and/or volunteer activities. Preference will be given to students who aspire to give back to their communities in the future. Candidates must have a minimum cumulative academic average of 70%. Interested students must submit the applicable undergraduate or graduate student award application by February 1. This fund is made possible by a donation from George and Cathy Raithby to help Indigenous students achieve their academic goals.

Method of Financing: endowment

RGA Award
Two awards, valued at $5,000 each, will be provided annually to Black or Indigenous undergraduate students enrolled in Year Two, Three, or Four of any co-op program in the Faculty of Mathematics, with a preference to Actuarial Science students. For the purpose of this award, an Indigenous person is one who is a citizen or member of a First Nations community (Status/Non-Status), Métis, and/or Inuit. For the purpose of this award, Black students may include African, Afro-Caribbean, Black Canadian, Afro Latine, African American, Afro-Indigenous, or other African descent. Selection will be based on academic achievement (minimum 70% cumulative average) combined with extracurricular involvement. Candidates must be Canadian citizens or permanent residents. Interested students should submit an application by November 1. This fund is made possible by a donation from co-op employer, RGA Life Reinsurance Company of Canada (RGA), who is committed to removing barriers for Black and Indigenous students.

Method of Financing: annual donation (three-year pledge)

Siemens Computer Engineering Award
Two awards, valued at $5,000 each, will be provided to students enrolled in Year Three of the Computer Engineering program in the Faculty of Engineering. One award is reserved for a student who identifies as a woman, to address the historic and current underrepresentation of women in Computer Engineering. Selection will be based on academic achievement (minimum 75% cumulative average), combined with extracurricular involvement, and a statement describing the impact this award will have on their ability to pursue their educational goals. Interested students should submit an application by October 1. This award is made possible by a donation from co-op employer, Siemens Canada.

Method of Financing: one-time donation/award

Siemens Computer Science Award
Two awards, valued at $5,000 each, will be provided to full-time undergraduate students enrolled in Year Three of any co-op program in the David R. Cheriton School of Computer Science. One award is reserved for a student who identifies as a woman to address the historic and current underrepresentation of women in Computer Science. Selection will be based on academic achievement (minimum 75% cumulative average), combined with extracurricular involvement, and a statement describing the impact this award will have on their ability to pursue their educational goals. Interested students should submit an application by November 1. This award is made possible by a donation from co-op employer, Siemens Canada, who is committed to removing barriers for women in STEM.

Method of Financing: one-time donation/award

Stantec Consulting Undergraduate Engineering Scholarship
A scholarship, valued at $2,500, will be provided annually to a top undergraduate student who identifies as a woman enrolled in Year Four of Civil Engineering wherein women are underrepresented. Selection will be based on academic excellence. This fund is made possible by a donation from Stantec Consulting Ltd. to support the education of future engineers and to promote equity and diversity in the field.

Method of Financing: annual donation (four-year pledge)

SUNDANCe Indigenous Award
An award, valued at up to $1,500, is available annually for an Indigenous undergraduate student enrolled in full-time degree studies in any year of any program at the University of Waterloo, Renison University College or St. Jerome's University. To be eligible, students must have completed the Indigenous Verification section in Quest and have had their Indigenous identity verified by the Office of Indigenous Relations at the University of Waterloo. Candidacy is limited to Ontario residents. Selection will be based on demonstrated connection and/or contributions to Indigenous communities through extracurricular and/or volunteer activities combined with financial need. Interested students should complete the Fall General Award Application by November 1.

Method of Financing: annual donation from an endowment held by WLU (on-going)

Szkotnicki Family Undergraduate Scholarship
Scholarships, valued at $5,000 each, will be provided annually to full-time undergraduate students enrolled in Year Two, Three, Four, or Five of any program in the Faculty of Mathematics. Selection is based on academic excellence (minimum 80% cumulative average). This fund is made possible by a donation from the estate of Jean and William (BMath '74, Statistics) Szkotnicki, who were committed to fostering a passion for mathematics and celebrating the successes of future generations.

Method of Financing: endowment

Wallman Architects Award in Sustainable Urban Design
An award, valued at $5,000, will be provided annually to a full-time undergraduate student enrolled in any year of the Architecture program in the School of Architecture. Selection is based on a student project that demonstrates excellence in sustainable urban design. Students interested in applying must submit an application that can be found on the School of Architecture website, by the advertised deadline, normally each spring. This fund is made possible by a donation from Wallman Architects.

Method of Financing: annual donation (three-year pledge)

Sunny Hon-Sum Wong Memorial Scholarship
A scholarship, valued at $3,500, will be awarded annually to a full-time undergraduate student enrolled in Year Two, Three, or Four of any program in the School of Accounting and Finance, from the Faculties of Arts, Environment, Mathematics, or Science. Selection will be based on academic excellence (80% cumulative average) combined with extracurricular involvement and/or participation in leadership activities. Interested students should submit an application by October 1. This scholarship was established in memory of Sunny Hon-Sum Wong (MAcc '01) by his many friends.

Method of Financing: one-time donation

Yuen Family Foundation Award for Healthy Aging
Three awards, valued at $10,000 each, are available annually for student groups undertaking a fourth-year Capstone Design project in any program in the Faculty of Engineering. The awards will go to projects that, in the opinion of the judges, demonstrate a potential for significant innovation in support of healthy aging, including older adults aging at home, assistance with activities of daily living, and maintaining both physical and mental health. The award funds will be divided equally among the winning team members. Interested students should submit an application through the following website: https://uwaterloo.ca/engineering/capstone-design-awards-application-form. This fund is made possible by a donation from The Yuen Family Foundation.

Method of Financing: annual donation (three-year pledge)

STUDENT-ATHLETE AWARDS

Abdelkader Family Excellence Award for Women's Squash
One or more awards, valued at up to $5,000 each, are given to members of the varsity women's squash team. This award recognizes strong athletic talent and contribution to Warriors Athletics and Recreation, their respective team and community. This fund is supported by Mohamed Kader.

Method of Financing: annual donation plus matching funds (five-year pledge)

Abdelkader Family Excellence Award for Men's Squash
One or more awards, valued at up to $5,000 each, are given to members of the varsity men's squash team. This award recognizes strong athletic talent and contribution to Warriors Athletics and Recreation, their respective team and community. This fund is supported by Mohamed Kader.

Method of Financing: annual donation (five-year pledge)

Beattie Alumni Volleyball Award
Multiple awards, valued at up to $5,000 each, will be given annually to varsity athletes on the men's or women's volleyball teams. These awards recognize athletic talent and contribution to Warrior Athletics, their team, and the school. This fund is supported by Warriors men's volleyball alumnus John W. Beattie and Warriors women's volleyball alumna Diane L. Beattie.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Barbad Bidarian Athletic Excellence Award for Men's Basketball
Two awards, valued at $5,000, are given to members of the varsity men's basketball team. Preference will be given to student-athletes enrolled in Computer Science or more generally, the Faculty of Mathematics. This award recognizes leadership, athletic talent, and contribution to the Department of Athletics and Recreation, Warriors Men's Basketball, and their community. This award is supported by Nakisa Bidarian (BA '01) in memory of his brother, Barbad Bidarian. Barbad, who attended Ohio State University, was a successful student and athlete with numerous interests, including a passion for basketball, track & field, music, art, and computer science.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Barbad Bidarian Athletic Excellence Award for Track & Field
Two awards, valued at $5,000, are given to members of the varsity track & field team. Preference will be given to student-athletes enrolled in Computer Science or more generally, the Faculty of Mathematics. This award recognizes leadership, athletic talent, and contribution to the Department of Athletics and Recreation, Warriors Track & Field, and their community. This award is supported by Nakisa Bidarian (BA '01) in memory of his brother, Barbad Bidarian. Barbad, who attended Ohio State University, was a successful student and athlete with numerous interests, including a passion for basketball, track & field, music, art, and computer science.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Biuck Morad Athletic Excellence Award
Two awards, valued at $5,000 each, are given to exceptional student-athletes enrolled in the School of Accounting and Finance, or more generally the Faculty of Arts, who best display the values and mission of the interuniversity athletics program. Preference will be given to candidates who best demonstrate the impact this award will have on their ability to pursue excellence both in the classroom and on their respective field of play. Recipients must be qualified student-athletes, enrolled in full-time studies both at the time of application and payment of the award, with a minimum academic average of 80%. An application is required by November 1. This award is supported by University of Waterloo alum, Nakisa Bidarian (BA '01), in memory of his grandfathers, Biuck Agha "Babje" Ashtaryeh and Morad Ali "Agha Jhune" Bidarian, who instilled in him the core values of integrity, excellence, and family.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Ryan Butler Memorial Football Excellence Award
One or more awards, valued at up to $5,000, are given to members of the varsity football team. Preference will be given to student-athletes who are enrolled in the Faculty of Engineering. This award recognizes leadership, athletic talent, and contribution to the Department of Athletics and Recreation, Warriors Football, and their community. This fund is supported by Tim Jeske (BASc '02, MMSc '12) in memory of his friend and former teammate Ryan Butler.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Centaur Products Athletic Excellence Award
Multiple awards, valued at up to $5,000, are given to student-athletes on any varsity team. This award recognizes leadership, athletic talent, and contribution to the Department of Athletics and Recreation and community. This fund is supported by Centaur Products Inc.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Domino's Pizza Athletic Excellence Award
Two awards, valued at $3,000 each, will be given annually to student-athletes on any women's varsity team. These awards recognize athletic talent, contribution to Warrior Athletics and contribution to the team and school. This fund is supported by Domino's Pizza.

Method of Financing: renewal of annual donation plus matching funds (two-year pledge)

Ms. Gritsiniak, Mr. Summers and Mr. Thompson Memorial Football Award
One or more awards, valued at up to $3,000, will be given annually to members of the varsity football team. This award recognizes strong athletic talent, leadership, and contribution to Warriors Football and the broader Department of Athletics and Recreation. This fund is supported by Warriors Football alumni Ivan Gritsiniak (BA '16), Nick Norwood (BA '17), and Spencer Thompson (BSc '13) in memory of Ivan's mother, Nick's grandfather, and Spencer's grandfather.

Method of Financing: annual donation (five-year pledge)

Poppy Hughes Excellence Award for Figure Skating
One award valued at $2,000 or two awards valued at $1,000, will be given annually to members of the varsity figure skating team. This award recognizes athletic talent and contribution to Warrior Athletics and Recreation, their team and their community. This fund is supported by Meghan Whitfield (BA '04) in honour of her daughter, Poppy.

Method of Financing: annual donation plus matching funds (five-year pledge)

Dr. Nurjahan Huq Excellence Award for Women's Squash
One or more awards, valued at up to $2,000 each, are given to members of the varsity women's squash team. This award recognizes strong athletic talent and contribution to Warriors Athletics and Recreation, their respective team and community. This fund is supported by Dr. Sarah Danial and Dr. Nasim Huq in memory of Dr. Huq's late mother, Dr, Nurjahan Huq. Dr. Nurjahan Huq was a trailblazer in her field and this award is in recognition of her feminist spirit and Islamic religious obligation to contribute to the community.

Method of Financing: annual donation plus matching funds (five-year pledge)

Dr. Huq and Dr. Danial Family Squash Award
One or more awards, valued at up to $2,000 each, are given to members of the varsity men's squash team. This award recognizes strong athletic talent and contribution to Warriors Athletics and Recreation, their respective team and community. This fund is supported by Dr. Sarah Danial and Dr. Nasim Huq.

Method of Financing: annual donation (five-year pledge)

O'Dell Associates Football Excellence Award
One or more awards, valued at up to $5,000, will be given annually to varsity athlete(s) on the football team, with preference given to a student-athlete enrolled in any program in the Faculty of Engineering. This award recognizes leadership, athletic talent and contribution to Warrior Athletics and Recreation, their team, the school and their community. This fund is supported by UW and Warriors Football alumnus Nathan Martin, a Partner with O'Dell Associates.

Method of Financing: renewal of annual donation plus matching funds (three-year pledge)

Strickland Family O Line Excellence Award
One or more awards, valued at up to $3,000, will be given annually to a member of the varsity football team who play on the offensive line. This award recognizes leadership, athletic talent and contribution to Warriors Athletics and Recreation, Warriors Football, and their community. This fund is supported by Warriors Football alum Sean Strickland (BA '86) and Dance alum Jill Strickland (BA '86).

Method of Financing: renewal of annual donation (five-year pledge)

Amar Varma Volleyball Award
Multiple awards, valued at up to $5,000 each, will be provided to full-time undergraduate student-athletes enrolled in Year One, Two, Three, or Four in the Faculty of Engineering who are members of a varsity volleyball team. This fund is made possible by a donation from Amar Varma, BASc `99, Electrical Engineering. Amar was a student-athlete on the Warriors men's volleyball team.

Method of Financing: one-time donation plus matching funds

Warriors Women's Squash Alumni and Friends Excellence Award
One or more awards, valued at up to $5,000, will be given annually. This award recognizes strong athletic talent, leadership, and contribution to Warriors Women's Squash and the broader Department of Athletics and Recreation. This fund is supported by alumni, friends and supporters of Warriors Women's Squash.

Method of Financing: annual donation plus matching funds (five-year pledge)

Waterloo 10km Classic Cross Country Excellence Award
Two awards, valued at $1,000 each, are given to members of the varsity men's or women's cross country teams. This award recognizes athletic talent and contribution to Warrior Athletics, their team and the school. This fund is supported by RunWaterloo, organizer of the Waterloo 10km Classic.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Waterloo Ravens Hockey Athletic Excellence Award
Four awards, valued at $5,000 each, are provided annually to student-athletes: two to members of the women's varsity hockey team and two to members of the men's varsity hockey team. These awards recognize athletic talent, contribution to Warrior Athletics and contribution to the team and school. This fund is made possible by a donation from the Waterloo Girls Hockey Association (WGHA).

Method of Financing: renewal of annual donation plus matching funds (three-year pledge)

Waterloo Region Minor Football Excellence Award
Two awards, valued at $4,000 each, are given to student-athletes on the varsity football team. Preference will be given to student-athletes who competed with the Waterloo Region Minor Football organization. These awards recognize athletic talent, a commitment to good sportsmanship on and off the field, a commitment to being a positive contributor to the community, and contribution to Warriors Athletics and Recreation and Warriors Football. This fund is supported by Waterloo Region Minor Football.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Watsa Family Men's Basketball Excellence Award
Multiple awards, valued at up to $5,000, are given to student-athletes on the varsity men's basketball team. This award recognizes leadership, athletic talent, and contribution to Warriors Athletics and Recreation, Warriors Men's Basketball, and their community. This fund is supported by the Watsa Family.

Method of Financing: annual donation (five-year pledge)

Webster Family Athletic Award of Excellence
One or more awards, valued at up to $2,500 each, are given to student-athletes on any women's varsity team. This award recognizes athletic talent and contribution to Warrior Athletics, their team and the school. This fund is supported by Roly and Brigitte Webster.

Method of Financing: renewal of annual donation plus matching funds (five-year pledge)

Women's Volleyball Excellence in Action Award
One or more awards, valued at up to $2,500, are given to members of the varsity women's volleyball team. This award recognizes leadership, athletic talent, and contribution to the Department of Athletics and Recreation, Warriors Women's Volleyball, and their community.

Method of Financing: annual donation plus matching funds (five-year pledge)

SUC - 2024-11 - Regular Agenda - Faculty of Mathematics

Meeting Information

Agenda Page Title

SUC - 2024-11 - Regular Agenda - Faculty of Mathematics

Career Level

Undergraduate

Faculty/Unit

Mathematics

Date

11/19/2024

Time

1:00pm

Location

Needles Hall 3318 / Virtual option

Summary

1. Major Plan Modification

- **Climate and Sustainability Specialization** - Creation of a new AMATH specialization.

Other Business

Attachment(s)

Course Proposals

Course Proposal Details

Courses: Retire

No proposals have been added.

Courses: New

No proposals have been added.

Courses: Changes

No proposals have been added.

Programs & Plans Proposals

Programs & Plans Proposal Details

Programs & Plans: Retire

No proposals have been added.

Programs & Plans: Major Modifications

Code	Title	Type	Workflow Step
Climate & Sustainability Specialization	Climate and Sustainability Specialization	Program	SUC Subcommittee, SUC Curricular Subcommittee | Under Review

Programs & Plans: Minor Modifications

No proposals have been added.

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.

Climate & Sustainability Specialization
Climate and Sustainability Specialization

Under Review | Fall 2025

Proposal Information

Workflow Status

In Progress

SUC Subcommittee, SUC Curricular Subcommittee expand ▲

Waiting for Approval | Approval Delegate(s)

Tim Weber-Kraljevski
Mike Grivicic
Diana Goncalves
Kuali - Arts
Kuali - Env
Melanie Figueiredo
Kuali - Math
Kuali - Eng
Kuali - Hlth
Ashley Day
Kuali - Science

Effective Date and Career

Career

Undergraduate

Important!

Effective Term and Year

Fall 2025

Proposal Details

Proposal Type

New

Academic Unit Approval

09/18/2024

Quality Assurance Designation

Major Modification

Major Modification Categories

Add/re-name a graduate research field, graduate specialization, honours, option, specialization, undergraduate diploma, minor

Recruitment Materials
No

Co-operative System of Study and Requirements
No

Creating or Changing Invalid Combinations
No

Rationale and Background for New Program/Plan
The rationale for this specialization stems from the urgent need to address the complex, multifaceted challenges posed by climate change. This specialization would equip students with the mathematical tools and methodologies necessary to model, analyze, and solve critical problems related to climate dynamics and environmental impact. By integrating principles of applied mathematics with sustainability science, the program aims to foster interdisciplinary collaboration and innovation. Graduates will be prepared to contribute to developing sustainable solutions, influencing policy, and advancing scientific understanding in areas such as renewable energy optimization, ecological modeling, and resource management. This specialization not only aligns with global sustainability goals but also enhances the relevance and applicability of mathematical education in tackling one of the most pressing issues of our time.

In the last graduation requirement, one of the 12 courses from which students have to pick 3 is 1.0 unit instead of 0.5. The idea is to allow students a certain amount of flexibility in allowing those who would really want to take the course to be able to use it for the specialization, but without allowing them to make it count for two courses.

Two of the four existing AMATH specializations already include an identical constraint: the Physics Specializationand the Biology Specialization. (It is the Economics and Engineering specializations that *do not* contain this additional constraint.) This constraint only applies to the requirement to “Complete 1 additional AMATH course at the 300- or 400-level.” In addition to courses explicitly listed in the required courses of the Applied Mathematics program, students must take 5 additional courses in any math subject, including the possibility for some of them to be AMATH. This requirement forces students taking the specialization to be more specialized in Applied Mathematics than other students not taking the specialization.

Approved at UAC on 20240930
Approved at FC on 20241022

Consultations (Departmental)
Consultations happened with both Chris Fletcher (Department Chair, Geography and Environmental Management) and Johana Wandel (Associate Dean undergraduate) from Environment who gave a preliminary OK to this option on July 12, 2024.

Student representatives were consulted during the undergraduate committee and department meeting when this specialization was proposed, and all AMATH students were invited to a termly pizza event wherein this change, among others, were discussed and feedback was gathered.

Approval for inclusion of PLAN 281 obtained on 2024-11-01 from Carrie Mitchell, Associate Director, Undergraduate Studies, School of Planning.

Supporting Documentation

General Program/Plan Information

Faculty
Faculty of Mathematics

Academic Unit
Department of Applied Mathematics

Field of Study
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

Declaration Requirements

Requirements Information

Invalid Combinations
No

Average Requirement
No

Graduation Requirements

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

Course Requirements (units)

Required Courses

3.5 - 4
Units to Complete

- Complete all of the following
  - Complete all the following:
    - GEOG207 - Climate Change Fundamentals (0.50)
    - AMATH362 - Mathematics of Climate Change (0.50)
    - AMATH361 - Continuum Mechanics (0.50)
  - Complete 1 of the following:
    - AMATH463 - Fluid Mechanics (0.50)
    - AMATH442 - Computational Methods for Partial Differential Equations (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)
    - GEOG309 - Physical Climatology (0.50)
    - GEOG307 - Societal Adaptation to Climate Change (0.50)
    - GEOG320 - The Cryosphere (0.50)
    - GEOG408 - Earth's Future Climates (1.00)
    - PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)

Grand Total Units: 3.5 - 4

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.

Notes

Workflow Information

Workflow Path	Faculty/AFIW Path(s) for Workflow	Senate Workflow
Committee approvals	Faculty of Mathematics	--

Dependencies

Dependent Courses and Programs/Plans

There are no dependencies

Academic Calendar Dates, 2025-2026

	Fall 2025	Winter 2026	Spring 2026
Co-operative Work Term Begins	Sept. 2 (T)	Jan. 5 (M)	May 11 (M)
Classes Begin	Sept. 3 (W)	Jan. 5 (M)	May 11 (M)
Holidays	Oct. 13 (M)	Feb. 16 (M) Apr. 3 (F)	May 18 (M) July 1 (W) Aug. 3 (M)
Reading Week	Oct. 11-19 (S-U)	Feb. 14-22 (S-U)	N/A
Convocation	Oct. 24, 25 (F,S)	N/A	June 16-20 (T-S)
Classes End	Dec. 2 (T)	Apr. 6 (M)	August 5 (W)
Make-up Day(s) for in-term holidays	N/A	Apr. 6 (M) for Apr. 3 (F schedule)	Aug. 4 (T) for May 18 (M schedule) Aug. 5 (W) for July 1 (W schedule)
Pre-Examination Study Day(s)	Dec. 3, 4 (W, R)	Apr. 7, 8 (T,W)	Aug. 6 (R)
Examinations Begin	Dec. 5 (F)	Apr. 9 (R)	Aug. 7 (F)
In-Person Exam Days for Online Courses	Dec. 5, 6 (F,S) Dec. 10, 13 (W,S)	Apr. 10, 11 (F,S) Apr. 15, 18 (W,S)	Aug. 7, 8 (F,S) Aug. 12, 15 (W,S)
Examinations on Sunday	Dec. 7 (U)	N/A	N/A
No Exams on the Following Days	Dec. 14 (U)	April 12 (U) Apr. 19 (U)	Aug. 9 (U) Aug. 16 (U)
Examinations End (including Emergency Day)	Dec. 19 (F)	Apr. 24 (F)	Aug. 20 (R)
Co-operative Work Term Ends	Dec. 19 (F)	Apr. 24 (F)	Aug. 21 (F)
Teaching days	60	60	60
Pre-examination Study Day(s)	2	2	1
Examination days	13 (+1 Emergency Day)	13 (+1 Emergency Day)	11 (+1 Emergency Day)

Symbols and abbreviations:

(M) Monday, (T) Tuesday, (W) Wednesday, (R) Thursday, (F) Friday, (S) Saturday, (U) Sunday, N/A – Not Applicable

Guidelines for Determining Academic Calendar of Dates

The following are principles and guidelines either formally agreed upon by Senate or adopted as common practice in determining the dates for the academic year.

1. That the practice of setting dates for each academic year continues to be an annual exercise.

2. That there be no fewer than 60 teaching days (12 weeks) in a term. A clear rationale for fewer than 60 teaching days must be communicated to Senate at the time calendar dates are approved. In calculating teaching days in a term, Saturdays, Sundays, and statutory or University holidays are excluded.

3. That attention be given to balancing the number of meets in courses. Where an imbalance may occur because of statutory holidays, the class schedule for a day different than the calendar day can be used to balance the number of course meets.

4. That Fall Convocation be the Friday and Saturday that fall in the third full week (beginning Sunday) of October.

5. That Spring Convocation be the Tuesday to Saturday in the second full week (beginning Sunday) in June.

6. That the Reading Weeks occur in all Faculties in the fall and winter terms. They must begin on the Saturday before the public holidays of Thanksgiving Day and Family Day and will end on the following Sunday.

7. That Fall Term classes in September begin on the Wednesday following the Labour Day holiday.
   Exception: The Fall Term begins on Tuesday, September 8th when Labour Day is September 7th.

8. That the start date for Winter Term be set as follows:
   - If January 1st is a Sunday, then start of classes is Monday, January 9th.
   - If January 1st is a Monday, then start of classes is Monday, January 8th.
   - If January 1st is a Tuesday, then start of classes is Monday, January 7th.
   - If January 1st is a Wednesday, then start of classes is Monday, January 6th.
   - If January 1st is a Thursday, then start of classes is Monday, January 5th.
   - If January 1st is a Friday, then start of classes is Monday, January 11th.
   - If January 1st is a Saturday, then start of classes is Monday, January 10th.

9. The start date for Spring Term be set as follows:
   - If May 1st is a Sunday, then start of classes is Monday, May 9th.
   - If May 1st is a Monday, then start of classes is Monday, May 8th.
   - If May 1st is a Tuesday, then start of classes is Monday, May 7th.

- If May 1st is a Wednesday, then start of classes is Monday, May 6th.
- If May 1st is a Thursday, then start of classes is Monday, May 5th.
- If May 1st is a Friday, then start of classes is Monday, May 11th.
- If May 1st is a Saturday, then start of classes is Monday, May 10th.

10. That there be no fewer than one pre-examination study day and when possible, two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of examinations. A clear rationale for using fewer than 2 days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

11. That there be no fewer than 13 examination days in the Fall and Winter Terms, and 11 examination days in the Spring Term. In addition, one Emergency Day with no scheduled examinations is added to the end of the examination period.

12. In calculating examination days, Saturdays which fall within the period are included, whereas Sundays and statutory or University holidays are excluded.
    Exceptions:

    Examinations will not be scheduled on the Saturday following Good Friday when that day falls within the examination schedule or the Saturday of the Civic Day weekend.

    The first Sunday within the examination period may be used when required to accommodate the prescribed number of examination days in the Fall Term.

13. That in the Fall Term no examinations be scheduled beyond December 22nd. The Emergency Day cannot be scheduled beyond December 23rd.

14. That Online Course Examination Days in each term be the first consecutive Friday and Saturday and the second consecutive Wednesday and Saturday in the examination period.

15. Grades due dates for on campus courses that have a scheduled final examination are normally scheduled seven days from the date of the final examination. Grades for online courses that have a scheduled final examination are due on the last day of the grades submission period. Grades for all courses without a scheduled final examination are normally due 14 days after the start of examinations.

16. Co-op work terms are expected to be 16 week in duration. Actual start and end dates may vary depending on employer or student requirements in consultation with Co-operative Education.

Rules that Require Exceptions with Rationale:

Rule 10
…That there be no fewer than one pre-examination study day and when possible, two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of examinations. A clear rationale for using fewer than 2 days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

In order to accommodate Online Course Examination Days early in the spring term exam schedule to ensure that grades from online courses are submitted before or on the deadline, only one study day is possible for the 2026 spring term.

Rule 12
… The first Sunday within the examination period may be used when required to accommodate the prescribed number of examination days in the Fall Term.

With fall term classes beginning September 3, 2025, and the scheduling of two study days prior to the fall final exam period, the first Sunday within the exam period was required for scheduling exams to accommodate the prescribed number of examination days.

Prepared by:
C. Newell Kelly, Registrar
July 2024

Credentials Framework: Overview

The following is a brief summary of the work and recommendations stemming from the Credentials Framework project, which was carried out in 2022-2023. Additional details can be found in the attached Credentials Framework Report and will be elaborated on at our meeting. Questions are welcome.

The University of Waterloo's current framework for academic credentials was designed in an earlier era. Many external developments suggest the need for its reconsideration, including shifting priorities in the business world and at other universities, including a growing focus on (i) credentials that indicate the acquisition of desirable skills sought by employers, and (ii) learners who are different from traditional students (e.g., at different stages in their lives and careers).

A project team was tasked with rethinking Waterloo's credentials framework with this context in mind as one of a series of initiatives that will help prepare the governance, administrative, and procedural ground for us to innovate, experiment, and evolve in the fields of teaching and learning—particularly related to interdisciplinarity and student flexibility and choice, a signature commitment in Waterloo's 2020-25 strategic plan.

The resulting recommendations are either program-related (flexible pathways that increase student agency over their education and creating new pathways into a Waterloo education) or pertain to governance/oversight (focused on the conditions required to facilitate the development of those pathways). The following is a summary of the project team's recommendations:

1. Establish clear criteria for use of the terms, "course" and "course equivalent" for all for-credit credentials.
2. Establish standard criteria for existing credentials, as a means of facilitating recommendation 3 and more.
3. Prepare the University for increased flexibility and student agency.
4. (a) Establish classifications for microcredentials that satisfy Ministry requirements and categorize credentials in ways that facilitate decision-making, e.g., it may make sense to classify all assessed microcredentials in terms of Level (general interest vs. graduate); Intensity (number of hours of effort); in addition to (iii) distinguishing between practical and theoretical content. (b) Ensure that microcredentials have clearly articulated learning outcomes that align with and justify these classifications.
5. Support "lifelong learning" by investigating mechanisms to create opportunities for learners to achieve "for-credit" credentials even if they are not actively pursuing a degree. Doing so will set a foundation for ideas like open enrolment and making it possible for mid-career professionals to enrol in graduate certificate programs without setting out to pursue a degree, etc.

6. Investigate and experiment with approaches that can help attract students from groups traditionally underrepresented at Waterloo.
7. Implement mechanisms for approval to stack non-credit credentials into for-credit credentials, ensuring academic credibility in ways that are efficient and appropriate to the size of the credential.
8. Update the University's formal approval mechanism by creating a Senate Alternative Credentials Committee (SACC) to handle alternative (non-credit) credentials.
9. SACC should be nimble while providing appropriate academic oversight: smaller than SUC/ SGRC; online and asynchronous work; voting members include a rep from each Faculty, AVPA, AVPGSPA; include "resource" members from relevant ASUs that can inform decision-making.
10. Form a new Senate Committee to oversee academic quality assurance processes at the graduate, undergraduate and non-credit levels.
11. Lead a consultative process to design QA processes for alternative credentials.

1 Contents

Credentials Framework

Executive Summary

The University of Waterloo's current framework for academic credentials was designed in an earlier era. Many external developments suggest the need for its reconsideration, including shifting priorities in the business world and at other universities, including a growing focus on (i) credentials that indicate the acquisition of desirable skills (i.e., those sought by employers) and (ii) learners who are different from typical/traditional university students (e.g., at different stages in their lives and careers).

Internally, the need for a review of our credentials framework is recognized by the University's senior academic leadership as one of a series of initiatives that will help prepare the governance, administrative and procedural ground for us to innovate, experiment, and evolve in the fields of teaching and learning—particularly as these relate to interdisciplinarity and student flexibility and choice.

The focus of this report is on *credentials*—i.e., a means of certifying that a person has achieved a high degree of knowledge (both conceptual understanding and practical ability) in some area, issued by an institution widely recognized and trusted as competent to attest to a learner's achievement. It is an unfortunate but common practice to conflate credentials with the mechanisms used to communicate that a learner has achieved a credential (i.e., a degree vs. a piece of parchment, or a microcredential vs. a badge that can be shared via social media). While it is hard to avoid this confusion—and the question of what credentials should be on offer is obviously related to questions about how to display credentials—the focus of this report is not the "methods of transport" for demonstrating credentials, but on what achievement those methods denote.

Recommendations

We list the report's recommendations here for convenience. Rationales are detailed in the body of this report. It is worth emphasizing that some of the recommendations are readily implementable and can be acted on quickly (e.g., recommendations 8, 10, and 11) while others will take much more work (e.g., recommendations 1 and 2, which have wide institutional implications and are associated with a higher complexity of detail which has not been (and would not appropriately be) worked out by the authors of this report.

The recommendations fall into two broad categories—program-related and governance/oversight-related:

- Program-related recommendations focus on meeting one of the signature commitments in Waterloo's 2020-2025 strategic plan: "empower[ing] students to leverage diverse learning experiences by creating more flexible pathways." We distinguish two senses in which the term 'flexible pathways' is used: (a) increasing student agency over their own education by, for instance, offering a wider range of possible programs or pathways ("flexible learning pathways"), and (b) the creation of new pathways into a Waterloo education, offering different kinds of programming and reducing barriers to programs ("audience-broadening"). These program-related recommendations also involve conditions that would

support both flexible learning pathways and audience-broadening: facilitating "stacking" of credentials where appropriate; facilitating the adoption of new kinds of credentials; and positioning the University to meet various sorts of requirements that are consequences of offering new sorts of credentials.

- Recommendations related to governance/oversight focus on the conditions required to facilitate programming-related recommendations.

Abbreviated list of recommendations:

1. Establish clear criteria for use of the terms, "course" and "course equivalent" for all for-credit credentials.
2. Establish standard criteria for existing credentials: Honours Bachelor's degree, Honours Bachelor's degree (co-op), Four-year general Bachelor's degree, Three-year Bachelor's degree, Honours Specialization, Specialization, Major, Minor.
3. Prepare the University for increased flexibility and student agency.
4. (a) Establish classifications for Waterloo's microcredentials that (i) satisfy Ministry requirements for preferred status (referred to as Ontario Microcredentials status at the time of writing of this report), and (ii) categorize these credentials in ways that facilitate subsequent decision-making within the University. This classification should apply to microcredentials aimed both at external audiences and degree-seeking students.
   (b) Ensure that all microcredentials have clearly articulated learning outcomes that align with and justify these classifications.
5. As part of the lifelong learning portfolio of the University, the University should actively investigate mechanisms that will create opportunities for learners not actively pursuing a degree to achieve credentials involving for-credit courses.
6. The University should actively investigate and experiment with approaches that can help attract students from groups traditionally underrepresented at Waterloo.
7. Implement mechanisms for approval to stack non-credit credentials into credit credentials at both the undergraduate and graduate levels. While it is important to ensure academic credibility via these approval processes, they should be efficient and appropriate to the size of the credential.
8. Update the University's formal approval mechanisms by creating a new Senate committee to handle alternative credentials (aimed at "external" audiences). We propose that it be called the Senate Alternative Credentials Committee (SACC).
9. The new SACC needs to maintain the nimbleness for which ACAC has been praised while providing an appropriate the degree of academic oversight for the sorts of credentials on offer.
    - SACC should be much smaller than either SUC or SGRC (as ACAC is currently).
    - SACC should continue to work primarily online and asynchronously.
    - 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.
10. Form a new Senate Committee to oversee academic quality assurance processes at all of the graduate, undergraduate and non-credit levels.

11. Task the AVPA, the AVP GSPA, and Academic Quality Assurance and Continuous Improvement Office with leading a consultative process in designing appropriate quality assurance processes for alternative credentials.

1 Introduction

The University of Waterloo's current framework for academic credentials was designed in an earlier era. Many external developments suggest the need for its reconsideration. To name a few: the ballyhooed move of many high-profile employers—especially large high-tech firms such as IBM and Google—to remove the requirement for traditional credentials such as Bachelor's degrees for many jobs; the related focus at some universities to focus on other ways of certifying learning achievement by students, particularly that are more explicit in their focus on specific skills; a growing need for reskilling and educational renewal for mid-career professionals and other sorts of lifelong learning; and a recognition of the need to open up university education to groups who historically have had less opportunity to avail themselves of it.

Internally, the need for a review of our credentials framework is recognized by the senior academic leadership of the University as one of a series of initiatives that will help prepare the governance, administrative and procedural ground for us to innovate, experiment, and evolve in the fields of teaching and learning in our pursuit of the aspirational goals developed through broad consultation with the University community and articulated in the current Strategic Plans and the Waterloo at 100 document. To note just a couple of examples:

- The 2020-25 strategic plan *Connecting Imagination with Impact* includes a "signature commitment" to "empower students to leverage diverse learning experiences by creating more flexible learning pathways." This commitment is worded to suggest that these learning opportunities and flexible pathways are part of the traditional core activities of the University, namely education for degree-seeking students but, especially in light of the plan's objective to "Establish a lifelong learning centre that will enable and encourage our alumni and other professionals to reskill in a society that increasingly requires continuous learning," also suggests a need for flexibility for non-traditional learners.
- Both the strategic plan and Waterloo @100 state a commitment to interdisciplinary academic programming to address the complex problems of our complex world. It is a worthwhile question to ask whether changes or additions to our existing credentials framework can facilitate achieving this goal.

1.1 Focus of this report

Precise definitions of any term are rarely possible for any interesting notions, and those used in this report are no different. Nevertheless, it will serve us well to try to be as clear as we can.

Clarification: Separating credentials from their "method of transport"

A *credential,* for the purposes of this report, is usefully characterized by the following points[1]:

- A means of certifying that a person has achieved a high degree of knowledge in an area
- "Knowledge" in this claim needs to be interpreted broadly as including an appropriate mix of conceptual understanding and practical ability
- It is issued by an institution (e.g., a university) widely recognized and trusted as competent to attest to a learner's achievement in this way

[1] Adapted from *Credential Confusion: A call for uniformity in practice and terminology*, Mike Simmons et al., AARCO report, p.6

We use the vague term "a means" here deliberately. Especially when it comes to some newer forms of credential, a common source of confusion is conflating (i) **the credential itself** with what one report helpfully refers to as (ii) **the "method of transport" for the credential**. In other words, is a "badge" the institution's attestation that a learner *learned something*, or is it a notation that the student posts on a social media platform? The distinction is easier to see in more traditional credentials: a degree is a credential granted by a university and we easily distinguish it from the parchment handed out at a convocation ceremony or a transcript listing the courses completed and grades achieved by the learner along the way.

The focus of this report is *credentials*, and not the question of "methods of transport" for credentials. While it is not always possible to keep these distinctions from bleeding into one another, the committee's view is that questions about credentials themselves need to be answered, at least in a preliminary way, before sensible decisions can be made about appropriate "methods of transport" for those credentials.

1.2 The purpose of establishing a new credentials framework at Waterloo

A new credentials framework should aim to satisfy a range of goals:

- It should facilitate answers to questions like:
    - What credentials should Waterloo be in the business of offering now?
    - Can we set up structures that will open up options for offering additional sorts of credentials in the future so the University can be nimbler in its adaptation to changing conditions?
- It should help establish and maintain consistent use of terminology in a field where such consistency is woefully lacking, and so help communicate the value of Waterloo credentials to external and internal audiences.
- It should answer crucial *governance* questions, so that internal stakeholders (e.g., Senate) and external audiences can be confident that the University can play the role of "institution widely recognized and trusted as competent" to attest to learning as the credentials signify.
- It should clarify the relationship between different sorts of credentials, for instance whether and under what conditions credentials developed with a mid-career learner in mind should be "stackable" into a credit that counts towards something like a traditional degree.

The committee that produced this report was not starting from zero with respect to these goals. In the mid-to-late 2010s, the Undergraduate and Graduate Operations Committees worked to standardize terminology relating to the most familiar sorts of credentials at Waterloo. More recently, an Alternative Credentials working group has worked towards standardizing descriptions of credentials and programming aimed at lifelong learners. The Alternative Credentials Approval Committee was set up in 2021 to support the launch of WatSPEED as a mechanism for governance and academic approvals and has implemented this standardized language.

As outlined in Appendix B, the committee behind this report consulted widely and did considerable research about the types of credentials offered by comparable universities, including (among many others):

- Two-year Associate Degrees
- MPhil (or similar) for people who complete all PhD requirements except the dissertation (or who fail dissertation exam)
- Competency-based certificates that fall outside traditional curricula
- Acknowledgement of student activities outside curricula (e.g., recognition of involvement in student leadership of community-based service)
- Credentials aimed at University staff (and others): leadership, enrolment management, supporting equity, etc.

Discussion of these topics is very difficult without spilling over into related topics like the financial implications of particular avenues, the complications of integrating "open enrolment" students into courses also offered to degree-seeking students, and so on. Full discussion of these related topics would make this report unwieldy, so we will not address any of them in detail. Nevertheless, where there are clear relationships to such matters, we will mention them.

2 Context

As noted, it is difficult to provide informative, accurate and non-circular definitions of some key terms that we will use repeatedly in this document. The following sections outline the types of credentials offered at Waterloo, their approval pathways, and the Institutional Quality Assurance process. See Table 1 for an overview of this information.

2.1 "Degree"

A crucial notion for us is the idea of a degree. Waterloo's Institutional Quality Assurance Process document refers to the Quality Council's definition, which is as follows:

> An academic credential awarded on successful completion of a prescribed set and sequence of requirements at a specified standard of performance consistent with the OCAV's Degree Level Expectations and the university's own expression of those Expectations (see Appendix 2) and achievement of the degree's associated learning outcomes.

Both the Council's and the University's degree level expectations make liberal use of vague terminology such as "general knowledge of … a discipline" for a bachelor's degree and "systematic understanding … at, or informed by, the forefront of their academic discipline" for a Master's degree. It is clear that there is a substantial reliance of long-established practices and standards to enable a community of scholars to judge whether particular "sequences of requirements at a specified standard of performance" are worthy of a degree credential for various levels of degree. For present purposes we can do no better than to adopt this as our working definition of "degree," and to take this as a basic conceptual building block in what follows.

2.2 "For credit" vs. "alternative" credentials

Next it will be useful to distinguish "for credit" and "alternative" credentials. Generally, at Waterloo the prescribed requirements for a degree include specified courses and milestones (e.g., at the graduate level milestones might include comprehensive exams, major research projects, or theses). We shall refer to such courses and milestones which *can* count towards a Waterloo

degree as “for credit.” We shall also refer to other sorts of credentials for which the requirements are “for credit” (e.g., specializations, minors, graduate certificates) as “for credit.” With this understanding, Waterloo currently offers a variety of “for-credit” academic credentials including undergraduate, professional, and graduate programming.

Waterloo also offers credentials that do not count as “for credit” in this sense. These include:

- WatSPEED courses, including some courses formerly offered by the Centre for Extended Learning’s former professional development unit. Some WatSPEED certificates involve completion of a series of related courses.
- “Certificate” offerings delivered by academic support units like the Centre for Teaching Excellence and Cooperative and Experiential Education, most aimed at degree-seeking students, others at staff or other non-degree-seeking learners.
- Professional and personal development opportunities for learners internal to Waterloo through Organizational and Human Development.

Waterloo is by no means alone in offering non-credit credentials. Terminology in this general area is used very inconsistently between institutions. For instance, sometimes a *microcredential* is taken to refer to a single course, normally of less than 12 weeks duration (in Ontario, this is required to be eligible for OSAP funding); others will refer to a sequence of related courses as culminating in a microcredential. The terminology for the category is also not consistent. The previously cited AACRAO report recommends the name “innovative credential,” preferring it to the more common “alternative credential” on the grounds that once alternative credentials become established, they will no longer be “alternative.” Granting this point, it seems like they will similarly no longer count as “innovative” at that same point. Since the name “alternative credential” has been in use at Waterloo, that is how we will continue to refer to them in this report.[2]

2.3 Approval pathways

Ensuring and attesting to the academic value of all credentials with the University of Waterloo name attached to them is ultimately the business of the University’s Senate. There are three bodies which either recommend approval of credentials to Senate or to which Senate has delegated the task of approving credentials:

- **Senate Undergraduate Council (SUC)** is responsible for approving or recommending three-year General degrees and four-year Honours degrees, including Co-op and Regular programs, and approval of the requirements (e.g. courses) required to complete them. It also approves related credentials such as minors and specializations.
- **Senate Graduate and Research Council (SGRC)** is responsible for approving or recommending (both research and course-based/professional) Master’s degrees and PhDs, as well as Type 1, 2, and 3 graduate Certificates. It also approves the requirements (e.g. graduate courses) for these degrees.
- **The Alternative Credentials Approval Committee (ACAC)**, established in 2021, is responsible for approving assessed and participation-based alternative (non-credit)

[2] The AACRAO report notes that the category is also sometimes referred to as “digital credentials,” which is problematic since not all such credentials are offered online.

certificates (predominantly including WatSPEED credentials, but also credentials offered through Cooperative and Experiential Education and the Centre for Teaching Excellence, and potentially by others in the future).

Waterloo also has several alternative (non-credit) professional development credentials that were approved by a predecessor of ACAC and that are marketed for learners external to Waterloo. Many of these courses are marketed as "microcredentials." Waterloo is one of the most active universities in the Ontario government's microcredentials database, i.e., the University offers many microcredentials that satisfy the Ministry's criteria for eligibility for OSAP funding.

Credentials for learners internal to the University, including workshops focused on regulatory requirements (e.g., safety training for lab personal) or personal growth (courses offered through Organizational and Human Development or the Office of Equity, Diversity, Inclusion, and Anti-Racism) do not have a formal Senate-related approval pathway.

3 Institutional quality assurance

Waterloo's "for-credit" offerings are, directly or indirectly, subject to the University's Institutional Quality Assurance Process (IQAP). Degree programs are subject to a cyclical review, one component of which is assessment of the appropriateness of program requirements. Currently none of our alternative credentials are subject to IQAP processes, though ACAC asks that all proposals for assessed credentials come with a plan to assess quality over time, the first of which were received and accepted by ACAC in 2023.

Table 1: Credentials offered by Waterloo and their approval pathway

Type of credential	Credentials offered	Approval/recommendation responsibility	Examples
Undergraduate	Bachelor's degrees (e.g., 3-year General; 4-year Honours) Minors Specializations Options	Faculty Council(s) → Senate Undergraduate Council → Senate	Honours BA in English Minor in Urban Studies Engineering specialization in Heat and Mass Transfer Bioinformatics option
Graduate	Master's PhD Type 1,2,3 Graduate Diplomas (GDips)	Faculty Council(s) → Senate Graduate and Research Council → Senate	MSc in Biology PhD in Kinesiology GDip in Computer Networking and Security
Non-credit/ alternative microcredentials	Non-credit certificates (either assessment or participation-based)	Alternative Credentials Approval Committee (ACAC)	WatSPEED, CEE, CTE courses
Professional development "microcredentials" *(external)*	Offered by WatSPEED, inherited from CEL's former PD unit	Professional Development Advisory Committee (Predecessor of ACAC)	Courses designed for career development (manufacturing, health care, Executive, leadership, etc.)

Professional development *(internal)*	Offered by OHD, IST, EDI-R, safety office, etc.	n/a	Lab safety Personal growth

4 Recommendations

The Committee offers recommendations in two broad categories: program-related and governance/oversight-related.

4.1 Programming

The recommendations in this section focused on meeting one of the signature commitments in Waterloo's 2020—2025 strategic plan: "empower[ing] students to leverage diverse learning experiences by creating more flexible learning pathways." This report differentiates between two distinct categories of "flexible learning pathways":

a. Increasing student agency over their own education by, for instance, offering a wider range of possible programs of study or pathways through particular programs of study. **In this report, we continue to refer to this as "flexible learning pathways."**

b. The creation of new pathways into a Waterloo education—reaching new student audiences by developing different sorts of programming (e.g., WatSPEED programs aimed at mid-career professionals), reducing barriers to programs (e.g., alternative admission processes or open enrolment), and so on. **In this report, we refer to these strategies as "audience broadening."**

In addition to facilitating the development of flexible pathways and audience broadening, the recommendations in this section facilitate the development of the following *conditions* that support these goals:

- Facilitating "stacking" where appropriate, between distinct categories of credentials. The most frequent discussions of "stacking" involve allowing mid-career learners to pursue non-credit credentials which, taken together, can lead to a more traditional for-credit credential, like a degree. As we mention below, though, the idea of stacking non-credit credentials as a possibility for degree seeking students was raised several times during our consultations.
- Facilitating the adoption of new kinds of credentials[3] in ways that:
    - allow clear articulation of their purpose, and
    - distinguishes them from existing credentials.
- Positioning the University to meet the anticipated requirements to
    - qualify for government funding for microcredential offerings, and
    - brand Waterloo credentials as Ontario Microcredentials.

During its consultations, the committee also heard many suggestions of ideas for alternative credentials (i.e., not-for-credit recognition for things such as involvement in student leadership or in helping the University reach its accessibility goals) aimed at students enrolled in a degree program at Waterloo.

[3] Note: Should the University opt to do so.

The following programming-related recommendations fall into three distinguishable but sometimes overlapping sub-categories: (1) those related to for credit offerings; (2) those related to alternative/non-credit credentials; and (3) those having to do with the relationship between first two sub-categories.

4.1.1 Better use of existing credit credentials

Recommendation 1:

Establish clear criteria for use of the terms, "course" and "course equivalent" for all for-credit credentials.

Responsibility: Undergraduate Operations, Graduate Operations

Rationale and Implementation notes: The 0.5 credit "half-course" serves as a basic building block at Waterloo in almost all programs. (This probably derives from the outsized influence of Co-op at Waterloo, which makes the eight-month "full credit" courses familiar at many schools impractical for many Waterloo programs). For present purposes we will follow Waterloo standard practice and use "course" to generally refer to a 0.5-credit course.

- Might there be a benefit to introducing a smaller unit of credit? During consultations, the committee heard expressions of frustration about "the tyranny of the 0.5 credit course," and a desire to allow smaller achievements to stack into a 0.5 credit. For example, multiple stakeholders, suggested that a variety of small modules related to equity and diversity could be bundled in a way that builds a "diversity" requirement for an undergraduate degree.
- Unfortunately, here is no general understanding of the criteria associated with the general understanding of what ought to be expected in terms of student achievement, effort, class time, or anything else to count as such a "half-credit" course. A satisfactory set of criteria should include answers to such questions and some general conditions about coherence of learning outcomes (to enable judgements about when to approve, for instance, the bunding of modules into credits).

Thinking through the "value" of credits and credentials in this way will facilitate much of the work described in the other recommendations in this section.

Recommendation 2:

Establish standard criteria for[4] credentials: Honours Bachelor's degree, Honours Bachelor's degree (co-op), Four-year general Bachelor's degree, Three-year Bachelor's degree, Honours Specialization, Specialization, Major, Minor

[4] The committee wants to be explicit about why this recommendation is directed only at the undergraduate level. In our consultations, and in particular in consultations with the AVPA GSPA, it was suggested that there was no need for an analogue of Recommendation 2 at the graduate level (because existing mechanisms that facilitate the sort of flexible pathways Recommendation 2 advances already exist at the graduate level

These criteria should include:

- A specific number of credits/credit equivalents required by each credential type;
- For undergraduate degrees, criteria such as completion of an appropriate UCR course and "breadth requirements"
- A requirement for coherence of overall learning outcomes for each credential type.

For degree programs, these outcomes should be organized around something deserving of the name of an academic discipline to satisfy the Undergraduate Degree Level expectations (UDLEs), including depth of knowledge in "a discipline."

Minors and other lesser credentials might be organized around more specialized topics.

Rationale and implementation notes: This recommendation is designed to facilitate flexibility in combining elements from programs in different areas to allow students to tailor their academic careers at Waterloo to their interests and the passions that brought them to Waterloo in the first place. This is a mechanism to facilitate "flexible pathways" capitalizing on the types of credentials already frequently found at Waterloo, though their criteria are often unclear or inconsistent between Faculties. Using the same structure for minors in different Faculties, for example, would remove an impediment that currently sometimes stands in the way of allowing students to combine a degree in one area with a minor in a very different field (i.e., the minor they want requires too many courses to fit within their honours program).

Consider a student who comes to Waterloo with an interest in the impact of climate change on social determinants of health. Waterloo does not have a program in this specialized, but potentially interesting and important, area of study. If a student enrols in the Faculty of Environment, the common definitions of these key credentials could facilitate a bespoke program without having to add it to the list of Senate approved programs. If an honours degree required completion of 40 "course equivalents," and the student's honours major required 20 courses in a climate change program, a minor in a relevant Health field covering social determinants might require 12 courses, and the student would have eight remaining courses in which to achieve their UCR credit and their breadth requirements. "Policing" appropriate combinations would not require much additional academic advising, and the pressure to create additional degree programs tailored to specific combinations of interests would be reduced.

Implementing Recommendation 2 will not be without its challenges. Currently there are inconsistencies in the use of the above terms both between and within Faculties. These inconsistencies are sometimes artifacts of the somewhat complicated historical evolution of programs within different parts of the University, but sometimes the differences are important to those involved in "outlier" programs because they are perceived as facilitators of worthwhile goals ("It is what gets our students into top graduate programs!"). Agreeing on who should have to change and how will be a complicated business. The efforts made by the Undergraduate Operations Committee and Senate Undergraduate Council to reach the current incomplete level of consistency took years. On the other hand, the committee is of the view that a serious commitment to flexible pathways makes this task worth the effort.

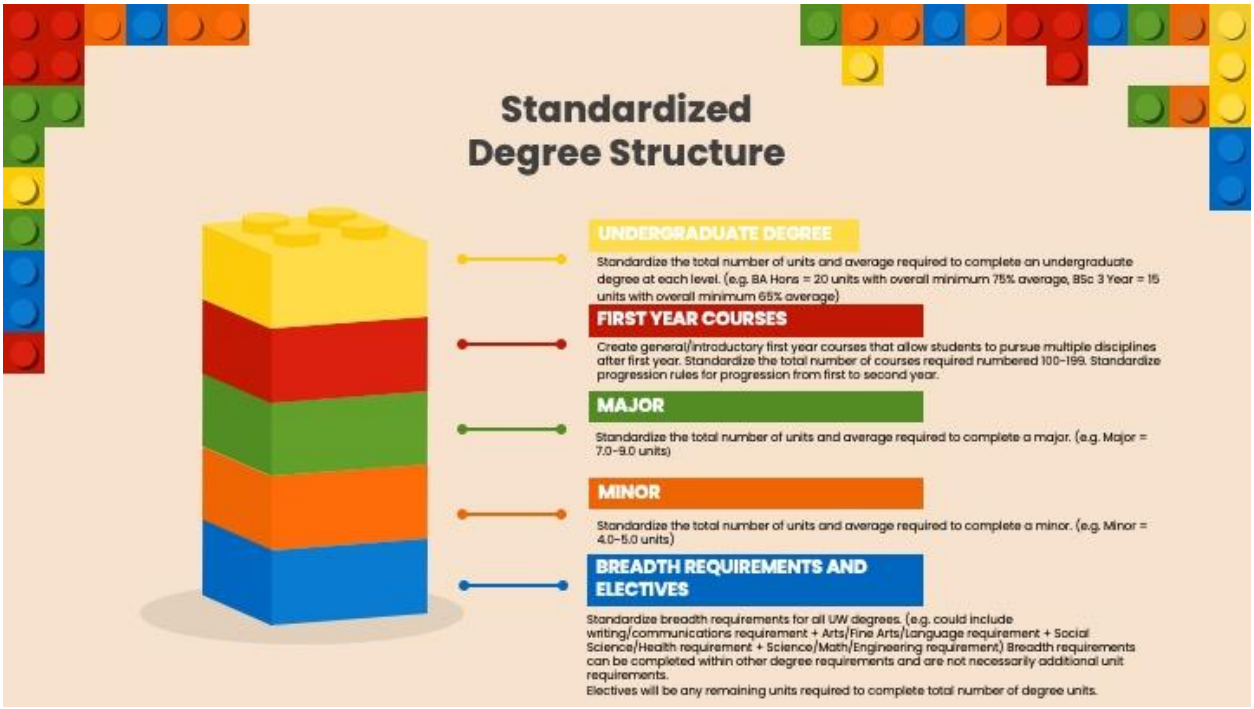
The benefits of working with the concept of "building blocks"

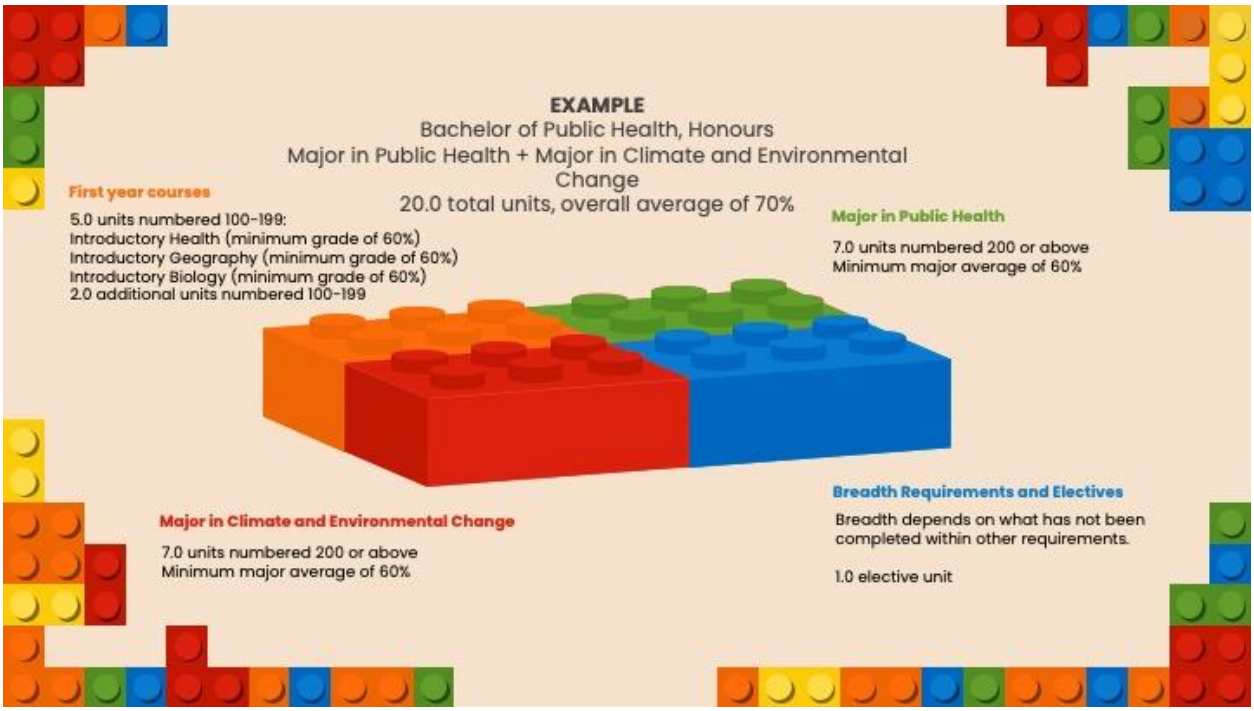
Standard definitions of these terms will facilitate use of a "Building Blocks Model." Figure 1 presents what we have in mind, *using fictional scenarios*. (There is no current standard number

of courses involved in a major across the University, for instance). Recommendation 2 involves standardizing the current set of building blocks used in undergraduate programming at Waterloo to facilitate combining these credentials in coherent ways. (It is always possible to add additional building blocks into the mix, such as "focused majors" that require more than the standard number of courses in a discipline, perhaps.)

The underlying idea is that a set of building blocks of unpredictably varying sizes obviously limits the number of structures that can be built from the blocks. While it is a further decision to say which blocks may be appropriately combined with other blocks, we believe that the Building Blocks Model is probably the most useful single avenue for opening up the possibilities for more flexible pathways for students than any action we might take given the current context in which the University operates.

Moreover, implementing this recommendation, together with a recognition of the values motivating it, will also create momentum in support of other concerns, like the common complaint that inflexibility of programs make it very difficult for students to pursue interests outside required courses, and a consequent request in some parts of the University that programs undergo a "curriculum diet," reducing the number of *required* elements to enable students to take more elective courses.




EXAMPLE
Bachelor of Public Health, Honours
Major in Public Health + Major in Climate and Environmental Change
20.0 total units, overall average of 70%
First year courses
5.0 units numbered 100-199:
Introductory Health (minimum grade of 60%)
Introductory Geography (minimum grade of 60%)
Introductory Biology (minimum grade of 60%)
2.0 additional units numbered 100-199
Major in Public Health
7.0 units numbered 200 or above
Minimum major average of 60%
Major in Climate and Environmental Change
7.0 units numbered 200 or above
Minimum major average of 60%
Breadth Requirements and Electives
Breadth depends on what has not been completed within other requirements.
1.0 elective unit

Preparing for newer things

The challenges of implementing Recommendation 2 are significant but are at least internal to the University. While the "Building Blocks model," if achieved, will be a substantial contribution to creating flexible pathways for learners at Waterloo, during the Waterloo @100 consultations and the consultations for this report there were frequent suggestions that the future of university education will involve programming that is *more of a departure from traditional degrees, minors, and the like.* The value, both to students and to society, of higher education that allows students to tailor programs to their individual interests and passions in ways that do not correspond to disciplinary distinctions that have over time become reflected in credentials (majors, minors, options, and the like) that have resulted in academic plans being approved by Senate or its designates. (The suggestions we heard included ideas like "a degree based on a problem, not on a discipline," or versions of a "choose your own adventure" degree).

Consultations with relevant experts on campus (e.g., in Institutional Analysis and Planning and the Quality Assurance Office) made clear that at present such programming would probably face very substantial hurdles that are a product of current rules for seeking Ministry approval, the way that Ministry funding is calculated, and from the Quality Council which must approve all new programs. For instance, current Ministry rules dictate that undergraduate degree programs must have a defined major subject. While subjects such as "Liberal Studies" or "Knowledge Integration" allow substantial flexibility, they are still far from "design your own degree." Moreover, each student currently brings a particular grant weighting depending on the major in which they are registered. Since it is not clear what box 'design your own degree' would fit into, it would probably be regarded as a square peg by Ministry decision makers. Finally, recent questions by GSPA to the Quality Council about their willingness to consider programs described with a lot of subject-matter flexibility did not receive a warm reception.

Nevertheless, the Working Group recommends that the University be prepared so that it *could* choose to implement programming that is flexible in new ways — for instance, programs organized around *problems* or *intractable issues* or, as is contemplated in Waterloo@100, around "futures"; or, indeed, programming involving as much student agency as versions of "design your own degree." Should these contextual factors change in the future, which may happen in response to pressure from students for more say in shaping their education or the need for Ontario to keep up with international trends in education that are attractive to international students and employers, the University should be ready. We should take steps now to ensure that we do not find ourselves in a position where our internal rules prevent us from moving forward efficiently when the opportunity arises.

Note: The recommendations in this section are directed only at the undergraduate level. In consultations with GSPA, it was determined that similar work is not required at the graduate level given the flexibility already provided by various sorts of Graduate Diplomas.

Recommendation 3:

Prepare the University for increased flexibility and student agency.

Rationale and implementation notes: The following are some steps that should be part of this preparation:

i. Review the UDLEs and GDLEs to ensure that they accurately reflect what the University wants Waterloo degrees to signal about the skills and knowledge our graduates possess.
    - Stakeholder suggestions included updating the "diversity" UDLE so that it includes not only knowledge that the world *is* diverse but also supports capacity to live effectively in a diverse society based on principles of tolerance, understanding of the history of Indigenous peoples in Canada, and an ability to reason about sustainability in relation to decisions relevant to fields of study.
    - At the same time, the University should establish criteria for their interpretation of key terms in the UDLEs (e.g., the word "discipline" could apply not only to established, Senate-endorsed academic programs covering a recognized discipline, but also to any topic with an appropriate degree of intellectual coherence).

ii. Investigate existing and potential mechanisms for the governance of interdisciplinary programs (in particular, for those that cross Faculty boundaries), revise policies and practices so that promising new mechanisms are allowed by the University's internal rules and prepare documents that make clear the pros and cons of each, so they are available and useful to those advancing new program ideas.
    - Currently some interdisciplinary programs are, nominally, "housed" in the Provost's Office, though in practice they are overseen by the Deans of the Faculties directly involved. Others are housed in one Faculty and collaboration is ensured by agreements of varying degrees of formality. None are housed in, for instance Centres and Institutes, which are administrative creatures whose ostensible goal is interdisciplinary cooperation. The latter fact is due to existing Senate by-laws about what constitutes an academic "unit" and which state that academic programs are to be housed in units, and that Centres and Institutes (unlike Faculties and departments) are not intended as "permanent" administrative structures. An investigation of the various models currently in use and some other possibilities (for instance, devising ways to house programming in the nodes in the "Futures Framework Network" under discussion in the wake of the Waterloo@100 report) is overdue. Such a project would be timely because the statement of pros and cons can benefit from the current discussions about integrated resource planning.
    - Prepare criteria for establishing time-limited academic programming. A long-standing challenge for universities is that it is much easier to establish programs than it is to shut them down. This is a significant impediment to establishing relevant and timely programs. It is, as noted, also a reason that time-limited administrative structures such as Centres and Institutes do not house academic programs at Waterloo. Programs designed with a "sunset" date allow for nimbleness, re-deployment of resources (including faculty teaching and supervisory capacity). They are a natural complement to ideas heard during the consultations leading up to Waterloo@100—to bring together groups of faculty, staff, and students to pursue problem/theme-based projects at the intersection of the "futures," as that vision only makes sense if these groups are understood to be ad hoc and temporary.

These ideas would be a natural project to assign to the Teaching Innovation Incubator. The Incubator can bring together a team and facilitate a project that could bring forward suitable recommendations on these related topics.

4.2 Audience broadening: Options for lifelong and non-traditional learners

Recommendation 4:

(a) Establish classifications for Waterloo's microcredentials that (i) satisfy Ministry requirements for preferred status (referred to as Ontario Microcredentials status at the time of writing of this report), and (ii) categorize these credentials in ways that facilitate subsequent decision making within the University. This classification should apply to microcredentials aimed both at external audiences and those aimed at degree-seeking students.

(b) Ensure that all microcredentials have clearly articulated learning outcomes that align with and justify these classifications.

Rationale and implementation notes: Such classification will have benefits both for recruiting students for these credentials and for improving efficiency and academic decision-making within the University (see recommendations 6 and 7 below). While the details of the required classification are not yet finalized, the Ministry's rationale for requiring some classification for the preferred status is sound. It will help (a) students understand what they are signing up for when they intend to take a course, (b) employers understand what a given microcredential certifies; and (c) will facilitate sound decisions about "stacking" of credentials. Clearly articulated learning outcomes will similarly be useful for all three of these constituencies.

A real-world example of what this might look like: It would be useful to classify all *assessed* microcredentials along each of these dimensions:

- **Level:** General interest; Undergraduate, no prerequisites; Undergraduate, with prerequisites; Graduate, general; Graduate, specialized.
- **Intensity:** Number of hours of effort for a typical student to complete satisfactorily.
- Distinguish between ***practical*** and ***theoretical*** content
    - Practical skills are often especially sought after in employment focused microcredentials; e.g., a health professional may need skills in "safe patient transfer"; on the other hand, when stacking into university credits, theoretical understanding of content with a degree of abstraction that allows skills to be readily employed in different domains may be expected.

The distinction between general and specialized content in "levels" dimension is important. For instance, graduate professional-level education is delivered at a level of sophistication appropriate to students who already have a degree, it may nevertheless be somewhat elementary for someone with an honours degree in the particular subject. Using a "for credit" example, some of the courses taught in the Master's of Public Service program cover issues essential for any public servant to understand and are taught at a level appropriate to someone with a previous Bachelor's degree; but these courses are fairly elementary to those whose Bachelor's degree happens to be in Political Science. This distinction is obviously important to so learners considering taking a course can assess whether they are prepared to succeed, but it is also important for decisions about "stacking" of credentials — see below.

Recommendation 5:

As part of the lifelong learning portfolio of the University, the University should actively investigate mechanisms that will create opportunities for learners not actively pursuing a degree to achieve credentials involving for-credit courses.

Rationale and implementation notes: Offering for-credit courses to learners not actively seeking a degree would make enable the University to expand its student base. The University currently already has specializations that are only available to learners registered as students (i.e., pursuing a degree, post degree, etc.), but that could be a suitable stand-alone credential likely to be of interest to many who are not currently interested in pursuing a degree. It also regularly offers courses, including many online, where the typical number of registered students is below the stated enrolment capacity of the course. The committee heard enthusiastic support for the idea of "bundling" for-credit courses as independent credentials during consultations, and this recommendation echoes an idea described in the Digital Learning Strategy report. Other Universities have had success with "open enrolment," and Waterloo is already working on a project investigating the steps required to have similar offerings at Waterloo.

Sorting through the mechanisms of other ways of offering such credentials might be an appropriate project for development in the Teaching Innovation Incubator.

Recommendation 6:

The University should actively investigate and experiment with approaches that can help attract students from groups traditionally underrepresented at Waterloo.

Rationale and implementation notes: A similar recommendation was made by the President's Anti-Racism Taskforce, particularly with respect to transitional programming for racialized learners, particularly those who are Black or Indigenous. Some early experiments aimed at developing such a program for Black learners are underway, led by EDI-R in consultation with the Registrar's Office. There is potential for such programs to also support other traditionally underrepresented learners, like those with disabilities, as part of the University's commitment to accessible education. The idea of "prior learning assessment" as a way to attract students has long been discussed at Waterloo but has not yet been pursued.

One of the reasons for establishing a Teaching Incubator is to serve as a mechanism for experimenting with and sorting out the details of such complex but potentially valuable initiatives.

4.3 Relationships between credentials

Recommendation 7:

Implement mechanisms for approval to stack non-credit credentials into credit credentials at both the undergraduate and graduate levels. While it is important to ensure academic credibility via these approval processes, they should be efficient and appropriate to the size of the credential.

Rationale and implementation notes: With respect to microcredentials developed for and aimed at those who are not currently Waterloo students, there are ongoing suggestions that the Ministry will restrict OSAP funding for microcredentials (and perhaps the use of the term "microcredential" itself) to programming that (at least potentially) is stackable into more traditional credit credentials. It is also likely that many offerings the University might have for mid-career professionals will be more attractive if they have the prospect of leading to a more traditional credential.

This recommendation is therefore one that the University must follow through on if it is serious about lifelong learning. As noted above, it was also frequently suggested in consultations that it would be a productive step towards flexible pathways for degree-seeking students if various alternative credentials aimed at them can be bundled together and count as equivalent to a credit course.

A mechanism for "stacking"

The details of this mechanism would need discussion, buy-in, and eventual approval by governance bodies, but the Committee suggests that a process along the following lines would be effective.

The "stacking" decision need not be complicated when the non-credit credentials are being deemed equivalent to (a portion of) a credit credential already approved by Senate or a Senate Committee. Approval of the equivalency of non-credit credentials can rest at the department level, and merely be reported to the Faculty and recorded centrally. It is already a routine matter for Associate Chairs to make "course equivalency" decisions when students transfer from other universities and decisions need to be made about which program requirements they can be deemed to have already completed. The stacking decision is fundamentally of the same kind. Since the equivalency decision does not require further involvement of any Senate committee, we judge the same to be true for this sort of stacking decision. For practical reasons (e.g., the ability of WatSPEED to accurately describe which of its credentials stack into which credit courses) these decisions should be centrally documented and remain in place until explicitly changed (e.g., because of a change in the course or in one of the microcredentials involved), to maintain consistency despite changes in departmental leadership.

The "mechanisms" for stacking could be as follows:

- Approval of non-credit credentials aimed at external audiences remains with ACAC (or its successor: see below).
- Approval of non-credit credentials aimed at current students requires approval from SUC or SGRC, but such approvals should be more efficient and "lighter weight" than, for instance, approval of credit courses:
    - A decision that a selection of non-credit credentials should count as equivalent to an existing (i.e., SUC or SGRC approved) credit course could be *made by program leadership (as 'course equivalents' are currently for transfer credits)*, approved pro forma by the Dean or their delegate, and reported annually to SUC/SGRC.

- A decision to count a collection of non-credit credentials as equivalent to an existing (sub-degree) credit credential (e.g., and option of specialization) should require approval by SUC/SGRC on behalf of Senate and reported to Senate.

Guiding criteria for when stacking is appropriate should be developed and endorsed by relevant Senate bodies. For instance, at the graduate level, a credit credential attests to a level of theoretical sophistication that might not be provided by microcredentials that are especially focused on development of practical skills. Criteria that involve comparison of the learning expectations of the various credentials involved to ensure that the expectations of the credit credential are met are therefore appropriate. The classification scheme for Waterloo's microcredentials (see Recommendation 5) will facilitate application of these criteria.

Note: Before leaving this section, we want to remark on a topic raised a few times during our consultations. As noted, there are a range of "credentials" offered on campus that are not approved by any Senate body. These include internally focused training offered by various units (OHD, EDI-R, CTE), often aimed at employees but also sometimes at students. It was noted that (a) Waterloo employees often take courses at other Universities because the credential the other institution offers is *perceived to be useful for career advancement*. The content on offer is sometimes similar-in-kind to some of our internally focused professional development and in other cases the content overlaps areas of internal expertise, but at the other school the training comes with some form of recognition (e.g., a badge or certificate or even a course credit). It is plausible to think that by not having the right "method of transport" for this training we are losing an opportunity to train our own people and also are passing up an opportunity to market our training to employees from other schools. This would qualify as "expanding our audience," but these non-Senate credentials do not seem to the Committee to obviously fall within our remit. On the other hand, we do note that the existence of ACAC does provide a mechanism for creating and approval of credentials based on this training that would allow the sort of marketing envisioned in appropriate cases.

4.4 Processes and governance

The discussion above makes clear that the lines between undergraduate, graduate, and alternative credentials are increasingly blurry as new sorts of credentials, both those aimed at current students and those aimed at new audiences, emerge. This might seem to militate against having different Senate committees to handle each of these categories, but the approval needs of each of the categories are sufficiently distinct that the Committee is confident in making the recommendations in this section.

Recommendation 8:

Update the University's formal approval mechanisms by creating a new Senate committee to handle alternative credentials (aimed at "external" audiences). We propose that it be called the Senate Alternative Credentials Committee.

Rationale and implementation notes: Since 2021, non-credit credentials have received formal academic approval via the Alternative Credentials Approval Committee (ACAC). The primary impetus for the design and implementation of ACAC was the University's move to be a bigger

player in offering educational opportunities for mid-career professionals, a move most emphatically signalled by the creation of WatSPEED.

Unlike the Senate Undergraduate Council and Senate Graduate and Research Council, ACAC's remit is not specified in a Senate by-law. Instead, it works with a remit developed to be consistent with Senate motions made more than two decades ago to cover "continuing education" programming, then primarily offered by (what is now) the Centre for Extended Learning. The decision to devise something different from the approval mechanisms used for continuing education was driven by the need for:

- an approval mechanism that would be recognized as ensuring the academic credibility of the new sorts of credentials WatSPEED wanted to offer.
- the approvals to be nimbler and more efficient that those that applied to traditional, for-credit credentials (so, as WatSPEED might say, it can 'move at the speed of business').
- recognition that not all non-credit credentials will be WatSPEED-developed credentials. Other ASUs, for instance, may lead the development of credentials intended for registered students and external audiences.

At the same time, it was essential that ACAC processes be consistent with and licensed by Senate motions, as the University of Waterloo Act makes clear that approval and oversight of all academic programming credentialed by the University of Waterloo must ultimately derive from Senate decisions.

The need to move beyond ACAC and the motivation for establishing it as a formal Senate committee is that ACAC's current remit (based on outdated Senate motions) restricts the sorts of offerings that can be approved in ways that will eventually hinder the growth of WatSPEED and other units interested in developing alternative credentials aimed at external audiences. (E.g., "Stackable" credentials seem to be ruled out because the existing Senate motions draw a red line between "extended education" and credit offerings; there are limitations on the length of a course that can be approved by a committee like ACAC that are likely to be problematically restrictive to units like WatSPEED—essentially, the existing Senate motion says "it can't look too much like a standard 12-week credit course.") Making ACAC a Senate committee by approving terms of reference in the Senate by-laws that generally parallel the terms of reference for SUC and SGRC will allow this committee suitable latitude to adapt as the needs of learners and the University evolve over time without need to repeatedly return to Senate for minor revisions to the committee's mandate.

Recommendation 9:

The new SACC needs to maintain the nimbleness for which ACAC has been praised while providing an appropriate the 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:

i. **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.

Rationale and implementation notes: When a small working group was tasked with replacing the previous Professional Development Committee with what became ACAC, it quickly became clear to them that two considerations needed to be balanced. The University community wanted assurance that our offerings would have academic credibility and that the reputation of the University was safeguarded. But 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 credit offerings. The ACAC process has generally been regarded, by those aware of it, as doing a good job of satisfying both those needs. The asynchronous nature of most deliberations has meant that approvals generally are completed within a week of a proposal coming forward.

Once SACC replaces ACAC and so becomes an official Senate committee, it will be subject to Bylaw 1, and so will be required to satisfy Bylaw 1's requirements about agendas, quorum, holding open meetings, and so on. During the consultations with the Secretariat about governance-related consequences of draft recommendations for this report, we received some assurances that Bylaw 1's requirements and ACAC's mode of operation can be reconciled.

Recommendation 10:

Form a new Senate Committee to oversee academic quality assurance processes at all of the graduate, undergraduate and non-credit levels.

Rationale and implementation notes: When Recommendation 9 is implemented, there will be three different Senate committees approving credentials: SUC, SGRC, and SACC. Quality Assurance and Continuous Improvement is an important part of preserving the credibility and value of all University of Waterloo credentials. For SUC and SGRC approved/recommended credentials formal quality assurance is an externally imposed requirement. For many SACC credentials, this is likely soon to be true as well. A single, special purpose Senate Committee devoted to the academic quality assurance and continuous improvement processes promises efficiency to those who must shepherd programs through QA processes and effectiveness for the processes themselves, compared to, for instance, each of SUC, SGRC and SACC overseeing their own processes.

A similar recommendation has been made to the Senate Executive Committee by the Senate Undergraduate Council, largely because Waterloo's current practices involve both SUC and SGRC in the IQAP process (as approvers of Final Assessment Reports and mid-cycle progress updates) resulting in long delays in getting approvals completed, involves many members of those large committees in processes where their expertise is not really required, and often does not result in meaningful feedback to programs. This recommendation went to Senate in May 2024 (item 11) and was approved. We have left the recommendation in this report because it was an important one to the Working Group.

Further support for this suggestion comes from the fact that it is increasingly clear that the Ministry of Colleges and Universities and the Quality Council are both moving decisively in the

direction of expecting non-credit credentials to be subject to appropriate academic quality assurance processes and be included in the IQAP (even if via quite different processes than the cyclical reviews used to assure quality of traditional credit programs). Especially as phenomena like stacking of credentials make the boundaries between types of credentials more porous, a single committee to oversee academic quality of all Waterloo offerings promises efficiencies and adaptability to new sorts of offerings over time.

Recommendation 11:

Task the AVPA, the AVP GSPA, and Academic Quality Assurance and Continuous Improvement Office with leading a consultative process in designing appropriate quality assurance processes for alternative credentials.

Rationale: There are both internal and external reasons for this recommendation. Externally, as just noted, there are signals that, for instance, eligibility of students taking microcredentials for government financial support will depend on QA processes for those credentials being part of the university's IQAP, and the designation Ontario Microcredential, which the University may seek for its WatSPEED offerings, will depend on appropriate QA processes being in place. Internally, our academic community expects every Waterloo credential to signal an appropriate level of academic quality; QA processes where the effort and rigor involved matches the significance of the credential are a way to assure the community that this remains true in the alternative credential space.

Appendix A: Glossary of Terms – current and proposed definitions

The following table lists some definitions/characterizations of important terminology used in discussions of credentials at Waterloo. As the University pursues some recommendations (e.g., Recommendation 1 about establishing clear criteria for what counts as a course or course-equivalent) the definitions in this table will need to be modified or expanded (e.g., if "discipline" receives a suitably broadened definition in accordance with Recommendation 3). The proposed definitions listed in this table are offered as a step towards increasing consistency and clarity in the use of this terminology in the meanwhile.

Term	Current UW definition	Proposed definition
Credential	Undergraduate Studies Academic Calendar - An earned degree, major, specialization, minor, option, diploma, or certificate appearing on a student's transcript.	A means of certifying that a person has achieved a high degree of knowledge in some area, where this knowledge includes an appropriate mix of conceptual understanding and practical ability. It is issued by an institution (e.g., a university) widely recognized and trusted as competent to attest to a learner's achievement in this way.
For-credit vs. alternative (credentials, courses, etc.)	N/A	Degrees are for-credit credentials. Courses and milestones which *can* count towards a Waterloo degree are also described as "for-credit." Other sorts of credentials for which the requirements are "for-credit" (e.g., minors, specializations, graduate certificates) are "for credit." For credit credentials are approved or recommended to Senate by SUC or SGRC. Alternative credentials are those which are not for credit in this sense. University of Waterloo alternative credentials are approved by SACC.
Degree-level expectations	CTE - Degree-level expectations (primarily outlined by OCAV) represent a set of minimum requirements all students must attain to earn the relevant degree. All undergraduate programs in Ontario must meet the requirements outlined in the university undergraduate degree-level expectations (UDLEs). UDLEs: Depth and breadth of knowledge; Knowledge of methodologies; Application of knowledge; Communication skills; Awareness of limits of knowledge; Autonomy and professional capacity. GDLEs: Depth and breadth of knowledge; research and scholarship; level of application of knowledge; professional	The minimum requirements to earn a degree. In Ontario, all university degrees must meet a set of expectations primarily determined by the Ontario Council of Associate Vice-Presidents (OCAV), but each university is free to implement additional expectations. Ontario undergraduate degree-level expectations (UDLEs): depth and breadth of knowledge; knowledge of methodologies; application of knowledge; communication skills; awareness of limits of knowledge; autonomy and professional capacity. Additional UDLEs specific to UW: experiential learning; diversity. Ontario graduate degree-level expectations (GDLE): depth and breadth of knowledge; research and scholarship; level of

	capacity/autonomy; level of communication skills; awareness of limits of knowledge.	application of knowledge; professional capacity/autonomy; level of communication skills; awareness of limits of knowledge
Academic Program	Undergraduate studies academic cal - A defined set of requirements (honours or general, regular or co-operative) common to a particular degree. Future Students - An undergraduate program is what you complete to earn your degree. A program will have a certain number of required courses you need to take along with electives that you choose. Graduate studies academic cal - A set of courses, a number of which may be mandatory and of a specialized nature, leading toward a particular degree.	A defined set of requirements for the awarding of a particular degree. The requirements, taken together, ensure an appropriate level of mastery in a specified, coherent area of knowledge and ensure that a student has an opportunity to satisfy the relevant degree level expectations and to achieve the program's learning outcomes.
Academic Plan	Graduate Academic Plan: A defined set of requirements for the awarding of a particular credential.	A defined set of requirements for the awarding of a particular credential that ensure a learner has acquired the level and type of knowledge the credential indicates they have.
Course	Undergraduate calendar - A unit of study relating to a specific academic discipline and identified by a course subject code and number. Graduate studies calendar - A unit of study relating to a specific academic discipline and identified by a course name/number.	An approved collection of activities that provide learners with the opportunity to acquire an identified body of theoretical or practical knowledge and to satisfy specified learning outcomes. For-credit courses are approved either by SUC or SGRC and have a specified unit weight. They generally are identified by a subject code and number, often but not necessarily identified with an academic discipline. The term "course" is also used for non-credit courses. Such courses are approved by the SACC.
Unit Weight	Undergraduate studies academic cal - The credit value associated with a course. Unit weights are used in the calculation of averages for academic standing. Most courses have unit weights of 0.5 and are of one-term duration. Some courses have other weights such as 0.25, 1.0, and 2.0. Registrar's Office - The credit value associated with a course. Unit weights are used in the calculation of averages for academic standing. Unit weights vary from 0 to 3.0 and most courses have unit weights of 0.5. Graduate studies academic cal - The credit value associated with a course.	A numerical value assigned to courses or milestones that form (or might form) requirements of a for credit credentials. Unit weights are used in the calculation of averages for academic standing. They are sometimes also referred to as "credit values." The most common unit weight is 0.5, which is the most common weight for courses of one term duration.

Elective	Undergraduate calendar - A course not specifically required for a degree or academic plan but counting towards it, to be chosen freely by the student either from within a specified group of courses or more broadly from courses offered anywhere across the University of Waterloo.	A course not specifically required for a degree or academic plan but counting towards it, to be chosen freely by the student either from within a specified group of courses or more broadly from courses offered anywhere across the University of Waterloo.
Milestone	Quest glossary Milestones are non-course degree requirements (e.g., thesis, comprehensives, master's research paper) that a student must complete toward degree progress in order to graduate	A non-course requirement for the completion of a credential (especially a degree). Examples include theses, comprehensive exams, major research projects, community service learning requirements, and workplace placements.
Undergraduate degree	Undergraduate Studies Academic Calendar - A qualification awarded to a student by the post-secondary educational institution. Types of undergraduate degrees: Bachelor's/ Baccalaureate, Professional Doctoral.	An academic credential awarded on successful completion of a prescribed set and sequence of requirements at a specified standard of performance consistent with the Ontario Council of Academic Vice-President's Degree Level Expectations (DLEs) and the University's own expression of those expectations, with any University-specific DLEs and achievement of the degree's associated learning outcomes. Undergraduate and graduate degrees are distinguished by having different DLEs, and by the fact that graduate degrees are normally pursued by learners who have an undergraduate degree credential (or an equivalent).
Major	Undergraduate Studies Academic Calendar - An academic plan that is the primary area of study in a student's baccalaureate degree. Future Students - A major is the subject that's the main focus of your university degree. Most of the courses you'll take will be in your major. The terms major and program are often used interchangeably. You might choose your major when you apply to university or after first year depending on the program.	A specified, coherent area of knowledge that is the primary area of study in an Undergraduate Academic Program that culminates in a Bachelor's/baccalaureate degree. Degrees with a particular Major can often be earned at different levels of achievement, e.g., Honours or General degrees. The terms "major" and "program" are sometimes used interchangeably. When doing so, "major" is standing being used elliptically to refer to the academic program that specifies the requirements for a degree with the major in question.
Minor	Undergraduate Studies Academic Calendar and "Undergraduate Academic Programming: Definitions and Guidelines" doc - An academic plan that is a secondary area of study and that provides breadth to a student's baccalaureate degree. Minors	An academic credential that attests to a substantial level and mix of theoretical and practical knowledge in a coherent and specified area of study. It is generally a secondary area of study in a student's bachelor/baccalaureate degree, and so will

	offered by faculties are normally available to all students. • No requirements • Range of courses: 8-10 courses (normally 4.0 – 5.0 units) • Has a distinct average requirement Future Students - In many programs, you can include a minor (usually 8-10 courses in a specific subject) as part of the 40 or so courses for your degree. This allows you to study a second area of interest.	generally involve learners accomplishing some but not all of the undergraduate degree level expectations in the specified area of study. The term “minor” is also used to refer to an academic plan specifying the requirements to achieve the credential. These requirements are designed to ensure that learners acquire and demonstrate the relevant level of knowledge by the time they complete the plan.
Undergraduate diploma	Undergraduate Studies Academic Calendar A defined set of academic courses that allows a student to acquire skills or knowledge in a specific area.	An academic credential that attests to a significant level and mix of theoretical and practical knowledge in a coherent and specified area of study. A diploma generally indicates a lesser degree of knowledge than a minor, but one still worthy of explicit acknowledgement. Diplomas are generally available to students in all Faculties. The term “undergraduate diploma” is sometimes also used to refer to an academic plan specifying the requirements to achieve the credential. The requirements are designed to ensure that learners acquire and demonstrate the relevant level of knowledge by the time they complete the plan.
Option	Undergraduate Studies Academic Calendar and **“Undergraduate Academic Programming: Definitions and Guidelines”** doc - An academic plan that provides depth to a student's baccalaureate degree and typically requires fewer courses than a minor. Options are only available to students within their home faculty. • No requirements • Range of courses: 6-8 courses (normally 3.0 – 4.0 units) Has a distinct average requirement	An academic credential that attests to a significant level and mix of theoretical and practical knowledge in a coherent and specified area of study. An option generally indicates a lesser degree of knowledge than a minor, but one still worthy of explicit acknowledgement. Options are generally available to students in all Faculties. The term “option” is sometimes also used to refer to an academic plan specifying the requirements to achieve the credential. The requirements are designed to ensure that learners acquire and demonstrate the relevant level of knowledge by the time they complete the plan.
Specialization	Undergraduate Studies Academic Calendar and **“Undergraduate Academic Programming: Definitions and Guidelines”** doc - An academic plan that offers an area of concentration and provides depth to a student's primary area of study. Specializations are only available to students within their primary area of study.	A credential that attests to a student’s having concentrated and deep knowledge in a particular area within their primary area of study (i.e., their major). As such, the credential is generally only available to students within their primary area of study. “Specialization” is also used as a term to refer to the academic plan that specifies the requirements for the credential.

	• No requirements • Range of courses not definable May have distinct average requirement	
Undergraduate certificate	Undergraduate Studies Academic Calendar and **"Undergraduate Academic Programming: Definitions and Guidelines"** doc - A defined set of requirements (which may include any combination of non-academic experiential components and academic courses), that allows a student to acquire skills or experience in a specific area. • Should include an experiential component and the option of one or more academic courses • Range of courses: 3 courses (normally 1.5 units) or less May have a distinct average requirement	A credential attesting that a learner has achieved a significant level of skill paired with some relevant theoretical knowledge in a particular area. The skill is at least in part acquired through experiential learning acquired. The term "undergraduate certificate" is also sometimes used to refer to an academic plan that results in achieving the credential. Such plans generally include three or fewer courses and require some experiential learning component, and sometimes require a distinct average requirement in the courses.
Graduate degree	Future Students - Allows you to pursue further specialized studies after completing your undergraduate degree. There are two levels: Master's degree (which often takes one to two years to complete) and Doctor of Philosophy (usually take four years to complete, also known as a PhD or doctoral program). You normally need to complete a Master's before applying to a PhD program. Types of graduate degrees: Master's/ Magisteriate, Doctoral	An academic credential awarded on successful completion of a prescribed set and sequence of requirements at a specified standard of performance consistent with the OCAV's Graduate Degree Level Expectations (GDLEs) and the University's own expression of those Expectations, with any University-specific DLEs, and achievement of the degree's associated learning outcomes. Undergraduate and Graduate Degrees are distinguished by having different DLEs, and by the fact that graduate degrees are normally pursued by learners who have an undergraduate degree credential (or an equivalent).
Graduate diploma (GDip)	Secretariat - A Graduate Diploma is awarded by the University upon completion of an approved Graduate Diploma program with a minimum of four graduate-level courses. For direct entry Graduate Diploma programs, the minimum admission requirements are the same as for a master's program, a four-year honours bachelor's degree or equivalent, with an overall 75% average in the last two years. A regular graduate studies application for admission is required. A Graduate Diploma program may be proposed by one or more departments/schools for a collaborative or interdisciplinary type diploma program	A credential that attests to a high level and a specified mix of theoretical and practical knowledge generally commensurate with graduate degree level expectations. Graduate Diplomas are assigned *types* following guidance from the Ontario Quality Council. At the University of Waterloo, Graduate Diplomas take the following forms: A **Type 1 Graduate Diploma (GDip1)** may be awarded when a candidate admitted to a course-based Master's program leaves the program after completing a specified portion of the degree requirements, normally half the course requirements, where the option has been specified through the program's approval process.

	which is offered in conjunction with a master's or doctoral program. Entry is approved by the Graduate Officer or Director of the Graduate Diploma program and the student's home department/ school Graduate Officer and Faculty Associate Dean. All Graduate Diploma programs require department/school, Faculty, SGRC and Senate approval, followed by review and approval from the Ontario Council on Graduate Studies (OCGS). A Graduate Diploma program and qualification is recorded on the official student academic record and conferred at convocation. Includes Type 1, Type 2, Type 3, or Type 4 diplomas	Students receiving a Type 1 GDip can return to complete the full degree, whereupon the GDip1 is rescinded. A **Type 2 Graduate Diploma (GDip2)** is intended to demonstrate mastery of a topic area that is complementary to, but not embedded within, a graduate student's primary area of study. As such, the type 2 graduate diploma is pursued concurrent with the student's primary Master's or PhD program. Completion of a GDip2 generally requires completion of additional requirements beyond a Graduate program's normal requirements. A **Type 3 Graduate Diploma (GDip3)** is earned when a student completes a direct entry, stand-alone program with an articulated set of learning outcomes achieved through a minimum of four 0.5 credit graduate-level courses.
Graduate Certificate	Secretariat - A Graduate Certificate of Participation or Completion is prepared and awarded by the department/faculty to acknowledge participation or completion of one or more courses, seminars or workshops. Awarding of a Graduate Certificate of Participation or Completion is not recorded on the official university record and academic transcript. Proposals for Graduate Certificates of Participation/Completion require department and faculty approval and are normally completed in conjunction with a master's or doctoral program, or non-degree graduate enrolment. All certificates of Participation/Completion approved by a department/school and Faculty must be reported to SGRC for information.	A credential awarded by a department or faculty indicating familiarity with a degree knowledge of or familiarity with an identifiable subject matter at the graduate level. A departmental/faculty graduate certificate indicates completion of one or more credit courses, workshops, or other milestones. A departmental graduate certificate of participation indicates attendance at one or more courses or workshops. The method of transport for such credentials shall not use suggest that it is a University of Waterloo credential nor bear the University of Waterloo coat of arms or any other University of Waterloo branding. Such credentials approved by a department or faculty must be reported to SGRC for information.
Microcredential/ microcertificate	Waterloo Alternative Credential Framework - Credential recognizing assessed achievement in a competency or its underlying knowledge areas, skills, or abilities. • Length of program variable; typically short time to completion • Issued by department/Faculty/ASU Variable format; upon approval, issuing bodies may request digital certification through Digitary	A credential recognizing a learner's achieving possession of a specified level of practical and theoretical knowledge. Often this knowledge is practical, and assessment involved demonstration of skills and abilities. While the time and effort involved in completion of a microcredential is variable, they are generally completable more quickly than a 0.5 unit for-credit course. University of Waterloo for credit microcredentials are possible. These are approved by SUC or SGRC and can be

		assigned a unit weighting or serve as degree milestones. Non-credit University of Waterloo microcredentials are approved by SACC. These normally are expected to satisfy the conditions required to be Ontario Microcredentials.
Professional Development Certificate **Executive Education Certificate**	Waterloo Alternative Credential Framework - Credential representing non-credit course of study; could be issued upon combination of learning experiences including courses, microcredentials, participation and attendance activities. • Length of program variable; Typically longer than microcredential or microcertificate • Issued by department/Faculty/ASU sponsoring the learning opportunity • Variable format; upon approval, issuing bodies may request digital certification through Digitary	A credential attesting to completion of an academic plan comprising specified non-credit learning experiences, completion of which demonstrates a degree of mastery of an identifiable body of practical and theoretical knowledge that has the potential to be of professional value to a learner. University of Waterloo Professional Development/Executive Education Certificates are approved by SACC. The distinction between the two types of certificate is based on the intended student audience.
Badge	Waterloo Alternative Credential Framework - Recognition of participation/ completion/ achievement in a workshop, non-credit course, event, committee, etc. • Length of program variable • Issued by department/Faculty/ASU sponsoring the learning opportunity • Variable format	A mode of delivery for a non-credit credential, generally making available to the learner and those with whom the badge is shared an articulation of the learning outcomes attested to by the credential, and often the activities involved in assessing the learner's knowledge.
Record of participation or completion	Waterloo Alternative Credential Framework - Recognition of participation/ completion/ achievement in a workshop, non-credit course, event, committee, etc. • Length of program variable • Issued by department/Faculty/ASU sponsoring the learning opportunity • Variable format	A mode of delivery for a non-credit credential that does not involve assessment of a learner's knowledge.

Appendix B: The Credentials Framework Working Group

Co-leads:

- David DeVidi, Associate Vice President, Academic
- Cathy Newell Kelly, Registrar

Additional team members:

- Jennifer Coghlin, Registrar's Office
- Anne Fannon, Work-Learn Institute
- Leanne Ferries, Associate Dean UG, Faculty of Health
- April Philpotts, WatSPEED
- Siva Sivoththaman, Associate Dean, Grad, Faculty of Engineering
- Tim Weber-Kraljevski, Secretariat
- Jeff Casello, Associate Vice-President, Graduate Studies and Postdoctoral Affairs

Project support staff:

- Harley Kaufmann-Sacrey, Research and Communications Coordinator, AVPA Office
- Carrie MacKinnon, Institutional Analysis and Planning
- Alisa Sivak, Communications Associate, AVPA Office

Appendix C: Processes and Sources of Information

This report is the product of extensive consultations and research conducted by members of the Credentials Framework Working Group over a period of nine months, including the following:

Environmental scan

The working group conducted an environmental scan that included (i) a compilation of credentials and pathways offered at other U15 institutions, and (ii) government standards, COU reports, and updates.

Stakeholder consultations

Members of the working group worked in pairs, including one faculty member and one representative from an academic support unit, to lead consultations with stakeholders.

Consultations with students and academic support units

Consultations were held with undergraduate and graduate students, and the following academic support units:

- Organizational and Human Development
- Quality Assurance and Continuous Improvement
- Information Systems and Technology
- Library
- Centre for Teaching Excellence
- Student Success Office
- Centre for Extended Learning
- WatSPEED
- Writing and Communication Centre
- W Store
- Campus Wellness
- AccessAbility Services
- Centre for Experiential Education
- Centre for Work-Integrated Learning
- Strategic Initiatives and Integrated Planning
- Office of Academic Integrity

These support units are all involved with credentials in one way or another, either as a unit that assigns credentials for completed training, as units that serve students who would benefit from a credentials overhaul, or as units tasked with governance and administration matters relevant to the approval and operation of academic programming.

Faculty consultations

Once the first round of consultations was complete, the working group met with Faculty leadership. Rather than holding a very large number of meetings that individual faculty members could attend, Chairs and Directors were asked in advance of these leadership meetings to consult with their department/school members about a list of questions and bring suggestions and feedback to the leadership meeting.

Associate Deans from the Faculties were also consulted in discussions at Undergraduate Operations Committee and Graduate Operations Committee. ***Expert Consultations***

After these consultations, multiple drafts of recommendations were produced and discussed at meetings of the Committee.

The committee consulted with constituencies likely to have particular expertise relevant to the recommendations for their feedback. These groups were selected because they were judged to be best placed to spot unintended consequences of the recommendations. These consultations included:

1. GSPA and QACI
2. IAP and the Assoc Provost for Integrated Planning and Budgeting
3. The Secretariat

After another round of revision in light of the expert advice, the Committee provided a final round of feedback.