

UNIVERSITY OF
WATERLOO



Senate

January 27, 2025

3:30 - 6:00 p.m.

Needles Hall

NH 3407

Waterloo Campus

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2025 01 27 Senate Meeting Book

AGENDA

3:30 p.m.	1. Territorial Acknowledgement		
3:35 p.m.	2. Approval of the Agenda and Minutes		
	2.1 Conflict of Interest	Declaration	
	2.2 Approval of the Agenda, and Approval of the Consent Agenda	Decision	
	2.3 Minutes of the November 25, 2024 Meeting - open and confidential	Decision	
	2.4 Business Arising from the Minutes		
	Memo, item 2.1-2.4		5
	SEN minutes 2024-11-25 (open).pdf		6
3:40 p.m.	3. Report of the President	Information	
	3.1 General Update		
4:00 p.m.	4. Report of the Vice President, Research and International	Information	
	4.1 Annual Report of the Office of the Vice-President, Research and International		9
4:15 p.m.	5. Report - Senate Graduate & Research Council		
	5.1 Senate Graduate and Research Council: Faculty of Engineering – Major Modifications	Decision	46
	That Senate approve the following major modifications for plans in civil engineering, electrical and computer engineering, and mechanical and mechatronics engineering, as presented and effective May 1, 2025.		
	5.2 Senate Graduate and Research Council: Faculty of Environment – Major Modifications	Decision	101
	That Senate approve the following major modifications to the Master of Development Practice Plan, effective May 1, 2025, as presented.		
4:25 p.m.	6. Report - Senate Undergraduate Council		
	6.1 Senate Undergraduate Council: Faculty of Mathematics – New AMATH Specialization	Decision	106
	That Senate approve the following major modification for a new specialization plan in applied mathematics, effective 1 September 2025, as presented.		
	7. Report - Senate Executive Committee		

4:30 p.m.	7.1 Proposed Amendment to Senate Bylaws - Governance Year That Senate gives first reading to the amendments to Senate Bylaws 1, 2, and 3 as presented in this report.	Decision	113
4:40 p.m.	8. Update on Government Legislation and Policy Requirements		
	8.1 Reporting on Government Directives – Bill 166: Anti-Racism/Anti-Hate Directive – Amendment to Policy 33, Ethical Behaviour That Senate approve the amendments to Policy 33 – Ethical Behaviour, as presented in the attached report, for recommendation to the Board of Governors for approval	Decision	117
	8.2 Bill 166 and Bill 185 - Report on Compliance Activity.docx		131
5:00 p.m.	9. Faculty Constitutions		
	9.1 Proposed amendments to the Constitution and By Laws of the Science Faculty Council and Assembly That Senate approve the amendment to the Constitution and By Laws of the Science Faculty Council and Assembly, as presented	Decision	135
	10. Report - Vice President Academic and Provost		
5:05 p.m.	10.1 Undergraduate and Graduate Admissions Update – Briefing Note	Information	137
5:10 p.m.	CONSENT AGENDA Motion: To approve or receive for information the items on the consent agenda, listed as items 11.1-11.6 of the Senate agenda		
	11.1 Senate Work Plan	Information	147
	11.2 Report - Senate Graduate and Research Council		
	11.2.1 Senate Graduate and Research Council: Graduate Studies Academic Calendar Changes That Senate approve the following Graduate Studies Academic Calendar changes, effective 1 January 2025, as presented.	Decision	149
	11.2.2 Senate Graduate & Research Council	Information	160
	11.3 Senate Undergraduate Council	Information	162
	11.4 Senate Long Range Planning Committee	Information	163
	11.5 Report - Vice President, Research and International		
	11.5.1 Awards, Distinctions, Grants, Waterloo International Engagements	Information	164
	11.6 Report - Vice President, Academic and Provost		
	11.6.1 Report of the Provost - Faculty Appointments, Leaves		176
	11.7 Committee Appointments – Teaching Awards To approve the committee appointments for the Distinguished Teacher Awards and for the Amit & Meena Chakma Award for Exceptional Teaching by a Student, as presented in this report.	Decision	177
	12. Items Removed from the Consent Agenda		
	13. Other Business	Input	
5:15 p.m.	CONFIDENTIAL SESSION Senators, Vice-Presidents, Secretariat and Technical Staff as required		
	14. Approval of the Minutes		

	14.1 Senate Minutes 2024-11-25 (confidential).pdf	Decision	179
	14.2 Business Arising from the Minutes	Information	
	15. Business Arising from the Minutes	Information	
5:20 p.m.	16. Report of the Honorary Degrees Committee		
	16.1 Recommendations for the title of Distinguished Professor Emeritus/a, and of Honorary Member of the University	Decision	180
5:25 p.m.	17. Dean of Engineering Nominating Committee	Decision	
	To be distributed separately and directly to senators on January 27, 2025.		
	18. Other Business	Input	
	19. Adjournment		

VISITORS TO SENATE MEETINGS - please register your attendance via email at senate@uwaterloo.ca

For Information

Open Session

To: Senate

From: Gen Gauthier-Chalifour, University Secretary

Agenda Item Identification: **2. Approval of the Agenda and Minutes**

2.1 Conflict of Interest

Senators are invited to declare any conflicts related to the open session agenda at this time. Should a conflict of interest arise during discussion, senators are asked to declare a conflict of interest as it arises.

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

2.2 Approval of the Agenda, and Approval of the Consent Agenda

Motion: To approve the agenda as presented/amended, and to approve or receive for information the items on the consent agenda, listed as items 11.1-11.7 of the Senate agenda.

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

2.3 Minutes of the November 25, 2024 Meeting – open and confidential

Motion: To approve the minutes of the November 25, 2024 meeting (open session), and to approve the minutes of the November 25, 2024 meeting (confidential session), as distributed/amended.

Documentation Provided:

- Minutes of the November 25, 2024 Meeting – Open Session
- Minutes of the November 25, 2024 Meeting – Confidential Session (see item 13.1 of the confidential agenda)

2.4 Business Arising from the Minutes

There are no items of business arising.

**University of Waterloo
Senate
Minutes of the November 25, 2024 meeting
[in agenda order]**

Present: Nasser Abukhdeir, Marc Aucoin, Veronica Austen, Jagdeep Singh Bachher, Jordan Bauman, Aubrey Basdeo, Jean Becker, Andrew Chang, Martin Cooke, Cecilia Cotton, Hans De Sterck, Laura Deakin, Charmaine Dean, David DeVidi, Mark Ferro, Paul Fieguth, Teresa Fortney, Genevieve Gauthier-Chalifour (Secretary), Mark Giesbrecht, Vivek Goel (Chair), Rob Gorbet, Mike Grivicic (Associate Secretary), Vikas Gupta, David Ha, Peter Hall, Kevin Hare, Neela Hassan, Natalie Hutchings, Nadine Ibrahim, Marc Jerry, Acey Kaspar, Achim Kempf, Veronica Kitchen, Scott Kline, Sachin Kotecha, Christiane Lemieux, Ondrej Lhotak, Lili Liu, Jennifer Lynes, Ellen MacEachen, Carol Ann MacGregor, Blake Madill, Colleen Maxwell, Kristiina Montero, Kirsten Muller, Cathy Newell Kelly, Christopher Nielsen, James Nugent, Troy Osborne, Everett Patterson, Nicholas Pellegrino, Nicholas Pfeifle, David Porreca, Neil Randall, Jacinda Reitsma, Mary Robinson, James Rush, John Saabas, Beth Sandore Namachchivaya, Rida Sayed, Asher Scaini, Mark Seasons, Marcus Shantz, Sivabal Sivaloganathan, James Skidmore, Christopher Taylor, Alexie Tcheuyap, Sharon Tucker, Diana Vangelisti, Johanna Wandel, Mary Wells, Clarence Woudsma, Changbao Wu

Guests: Graham Brown, Aldo Caputo, Katie Damphouse, Randy Dauphin, Ashley Day, Nenone Donaldson, Bernard Duncker, Donna Ellis, Becky Elming, Melanie Figueiredo, Jenny Flagler-George, Anne Galang, Diana Goncalves, Diane Johnston, Karim Karim, Andrea Kelman, Jennifer Kieffer, Nick Manning, Eleanor McMahon, Kelly McManus, Bessma Momani, Fayaz Noormohamed, Chris Read, Allan Starr, Brandon Sweet, Nickola Voegelin, Tim Weber-Kraljevski, Esther Wingate, Katy Wong-Francq

Regrets: John Abraham, Bilal Ahmed, Avery Akkerman, Judy Castaneda, Kim Cuddington, Catherine Dong, Murray Gamble, Chris Houser, Narveen Jandu, Brad Lushman, Stephanie Maaz, Shana MacDonald, Peter Meehan, Richard Myers, Siva Sivoththaman, Katie Traynor, Stanley Woo, En-Hui Yang

OPEN SESSION

The chair welcomed senators to the meeting. He noted that nominations for Senate elections for faculty and graduate students will open on January 7, 2025. Senators received invitations for informal lunch discussions of the 2023/24 Annual Report of the Office of the Vice-President, Research and International, the first of which was held earlier that day, and the second December date was postponed due to illness and was rescheduled to January.

1. Territorial Acknowledgement

Rida Sayed provided the territorial acknowledgement and a personal reflection.

2. Approval of the Agenda and Minutes

2.1 Conflict of Interest.

No conflicts of interest were declared.

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

A motion was heard to approve the agenda as presented, and to approve or receive for information the items on the consent agenda, listed as items 6.1-6.5 of the Senate agenda. Hare and Pfeifle. Carried.

2.3 Minutes of the October 21, 2024 Meeting – open and confidential.

A motion was heard to approve the minutes of the October 21, 2024 meeting (open session), and to approve the minutes of the October 21, 2024 meeting (confidential session), as distributed. Porreca and Bauman. Carried.

2.4 Business Arising from the Minutes.

There were no items of business arising.

3. Report of the President

3.1 General Update

Goel noted the recent announcement that the provost intends to step down from his role on June 30, 2025, and a search for his successor will commence in short order. An announcement of an interim provost will be forthcoming. Senators were invited to provide any input on this matter via email, following the meeting.

It was noted that Ian Vanderburgh was recently named special advisor to the provost on strategic enrolment management with a term to June 30, 2025, where he will oversee the development of a robust SEM framework that will link a data-driven approach to the cycle of activities related to outreach, recruitment, admissions, retention, and student satisfaction.

With respect to government relations, Goel noted the University's work is ongoing to meet the requirements of Bill 166, and that consultations will be carried out by the responsible bodies with a view to any policy approvals coming forward at upcoming meetings and to the Board of Governors meeting on February 4. Goel noted that negotiations with the province regarding the University's strategic mandate agreement are upcoming, and the province has signaled that universities can expect new accountability requirements and no changes to grant funding or the domestic enrollment corridor over the first years of the new agreements.

The recent budget town hall (Nov 18) was highlighted, in addition to recent communications to the campus community on the status of the operating budget and the potential for financial restraint entering into the next budget year.

3.2 Statement on Institutional Neutrality and Communications

Goel observed that there have been several conversations around such a statement at Senate over the past year, which will assist in setting a framework for deciding when the University administration will issue statements on a particular matter. Parallel work is being done to provide guidance on instances where units within the University may take an official position, along with directions on the use of University resources such as websites, social media resources, email etc. Related to this statement, senators will have seen the call for expressions of interest for the Presidential Advisory Committee on Freedom of Expression and Inclusive Engagement, and that committee will also review this statement as part of its mandate. Comments and suggestions are welcome and may be routed directly to Christine McWebb, AVP Faculty Planning and Policy, or through the Secretariat.

Members discussed the statement, providing a variety of observations and sentiments. It was noted that similar statements at comparator universities are perceived to be narrower in their scope, and institutional neutrality is a controversial topic within academia. It was suggested that a statement of institutional restraint may be better suited to avoiding contributing to a negative dynamic, and that substantial consultation and input from the community ought to be sought on this statement. A senator noted that certain student clubs may be unnerved and question the effects of putting such a statement in place. It may be impossible for the University to remain neutral in all cases when some moral/societal issues may compel taking a position, and a position of principled neutrality would be prudent in those cases. It may be sensible to slow down on the pace of activity for the various task forces to allow conversations to occur among faculty, staff and students and allow that time for considered discussion before moving forward. This statement arises from considerable discussion/consultation, and the issues where this statement would apply are not going away. The statement supports institutional neutrality to allow instructors to teach on topics that may be controversial without being seen to be pressured in any one direction, which supports academic freedom. It is impossible for the University to enunciate the values of all members of the community uniformly, and making such enunciations would jeopardize the working and learning environment. It was noted that consideration be given to the role of the university in training critical thinkers. The objective should be to facilitate groups of professors and students in their own debates on the topics of the day. Goel reiterated that the statement is intended to guide senior administration and is not a policy, and that input will continue to be received to support the advisory committee in its work.

A group of visitors disrupted the meeting.

4. Report - Senate Graduate & Research Council, and Senate Undergraduate Council

4.1 Joint Report – Senate Graduate & Research Council and Senate Undergraduate Council: Academic Calendar Dates for 2025-26

DeVidi provided a short overview of the item, noting that the recommendation follows the guidelines included as an appendix to the report and also observing that in some cases exceptions were required to create a workable calendar of dates for the upcoming year. A motion was heard to approve the 2025-2026 academic calendar dates and calendar guidelines for establishing academic dates, as presented. DeVidi and Newell Kelly. Carried.

5. Report of the Vice-President, Academic and Provost

5.1 University Committee on Student Appeals Annual Report (Policy 72)

DeVidi gave an overview of the report, noting that good progress has been made on the new campus incident system and that the data in the report has been expanded to include the past 10 years. Members discussed the report. Regarding academic offenses, faculty would benefit from recommendations to assist in students' ethical formation. The data also points to cultural issues within the campus community, and the University needs to support students thriving at Waterloo. Some offences may be mitigated by adjusting the pedagogical approach and selecting appropriate instruments for assessments. One element to leverage is that repeated surveys show that students dislike the cheating of other students. Honour codes are implemented at some other institutions. There may be issues of data quality as this data may not reflect the actual incidence of offences. It may be useful to anonymously survey students and instructors on these topics to gain insights. The focus on cheating offences diverts the focus from student

learning, and with so much emphasis on student success it may be sensible to take a more holistic approach in engaging students.

Goel noted that Senate can invite Marlee Spafford, special advisor to the provost on student experience, to a future meeting.

CONSENT AGENDA

The following items were received for information.

6.1 Senate Work Plan

6.2 Report - Senate Graduate & Research Council

6.3 Reports - Fall 2024 Convocation

6.3.1 Report on Fall 2024 Convocation

6.3.2 Degrees Awarded Report

6.4 Report - Vice President, Research and International

6.5 Report of the Vice President, Academic and Provost - Faculty Appointments, Leaves

7. Items Removed from Consent Agenda

No items removed from the consent agenda.

8. Other Business

There was no other business.

With no other business, the committee convened in confidential session.

December 2, 2024

Mike Grivicic
Associate University Secretary

For Discussion

Open Session

To: Senate**Sponsor:** Charmaine B. Dean, Vice President Research and
Contact Information: International
vpri@uwaterloo.ca**Presenter:** Charmaine B. Dean, Vice President Research and
Contact Information: International
vpri@uwaterloo.ca**Date of Meeting:** January 27, 2025**Agenda Item Identification:** 4.1 Annual Report of the Office of the Vice-President, Research and International**Summary:**

Presenting the Vice-President, Research and International 2023/24 Annual Report to Senate. This report to Senate highlights key research, international and entrepreneurial outputs and outcomes for the year 2023/24.

Documentation Provided:

- Vice-President, Research and International 2023/24 Annual Report to Senate

LEAD ADVANCE ENGAGE AND SUPPORT RESEARCH

ANNUAL SENATE REPORT 2023/24

UNIVERSITY OF
WATERLOO







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VELOCITY

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Five Thousand XX / DOLLARS

MEMO Winter 2024 VPC Velocity

LEAD UNCONVENTIONAL INNOVATION: WATERLOO VENTURES

U15 Universities globally producing investment-backed undergraduate entrepreneurs

Pitchbook Top 100 - (Total Jan 2013 – Sept 2024)

Rank	University	Founders	Companies	Capital Raised
1	University of Waterloo	562	478	\$20.0B
2	McGill University	558	511	\$19.9B
3	University of Toronto	531	488	\$26.3B
4	University of British Columbia	367	323	\$5.6B
5	Queen's University	272	243	\$8.3B
6	University of Western Ontario	194	184	\$2.4B

2023/24 University of Waterloo Entrepreneur Program Overview

Cornerstone program

150–200 STUDENT TEAMS

received entry-level entrepreneurship training and mentorship through the critical customer discovery process.

Up Start program

30 TEAMS OF FACULTY MEMBERS AND GRADUATE STUDENTS

received mentorship and funding that totalled \$450,000 to explore the commercialization potential of deep tech inventions and ventures.

Velocity incubator program

70 TEAMS OR 150 CLIENTS

predominantly from the University of Waterloo received founder mentorship and support, including development space.

WatCo

500–1000 FACULTY AND STUDENTS

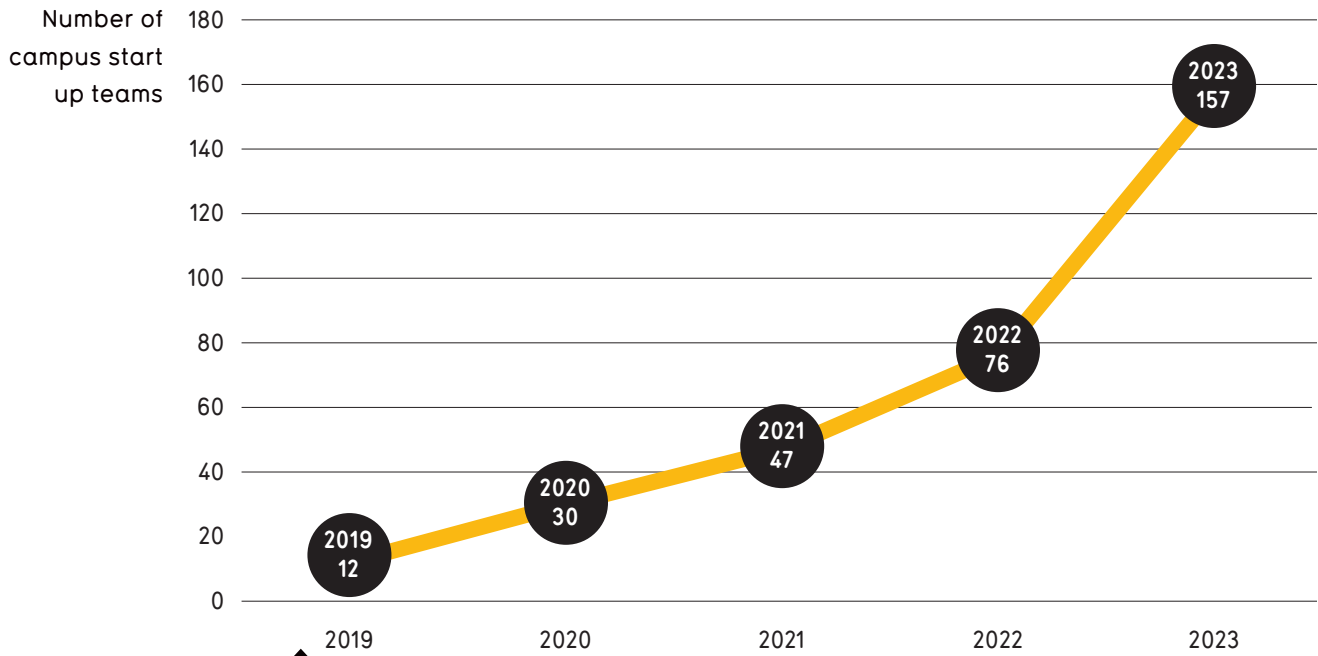
received IP\Commercialization educational and IP development support.

U15 Universities globally producing investment-backed undergraduate female entrepreneurs

Pitchbook Top 100 - (Total Jan 2013 – Sept 2024)

Rank	University	Female Founders	Companies	Capital Raised
1	McGill University	93	92	\$1.1B
2	University of Toronto	79	76	\$677M
3	University of Waterloo	51	50	\$582M
4	Queen's University	41	41	\$2.4B
5	University of British Columbia	41	41	\$412M

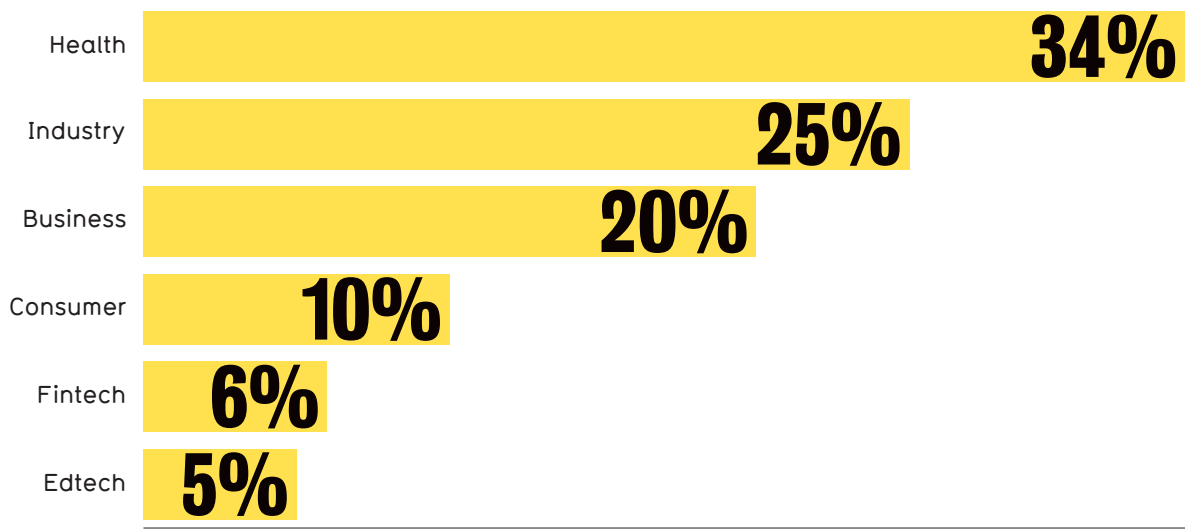
Growth of University of Waterloo Campus Startup Teams



↑ 107% increase in count of campus startup teams between 2022 and 2023 due to a strategic decision to support more teams.

Source: Velocity internal tracking

Percentage of 2023 Campus Startup Teams by Type



Source: Velocity internal tracking



For a comprehensive list of recent Velocity founder stories, visit

www.discovervelocityincubator.ca



Innovation Arena

In late November 2024, the new Innovation Arena opened in downtown Kitchener.

It is a space for the forging of health-tech, deep-tech and software company partnership and growth.

Expected outcomes of the Innovation Arena and its partnerships

Create
730 SKILLED JOBS

Support of
135 BUSINESSES

Commercialize
150
new health-related products,
services and processes

“

The Innovation Arena is driven by a community that has a common vision, a bold strategy and the talent, research and ideas to deliver on possibilities. Momentum in the Waterloo region and the city of Kitchener is building to support technology-inspired innovations in health care and delivery. The Innovation Arena will also play a crucial role in expanding the impact and scope of Waterloo’s flagship incubator, Velocity.”

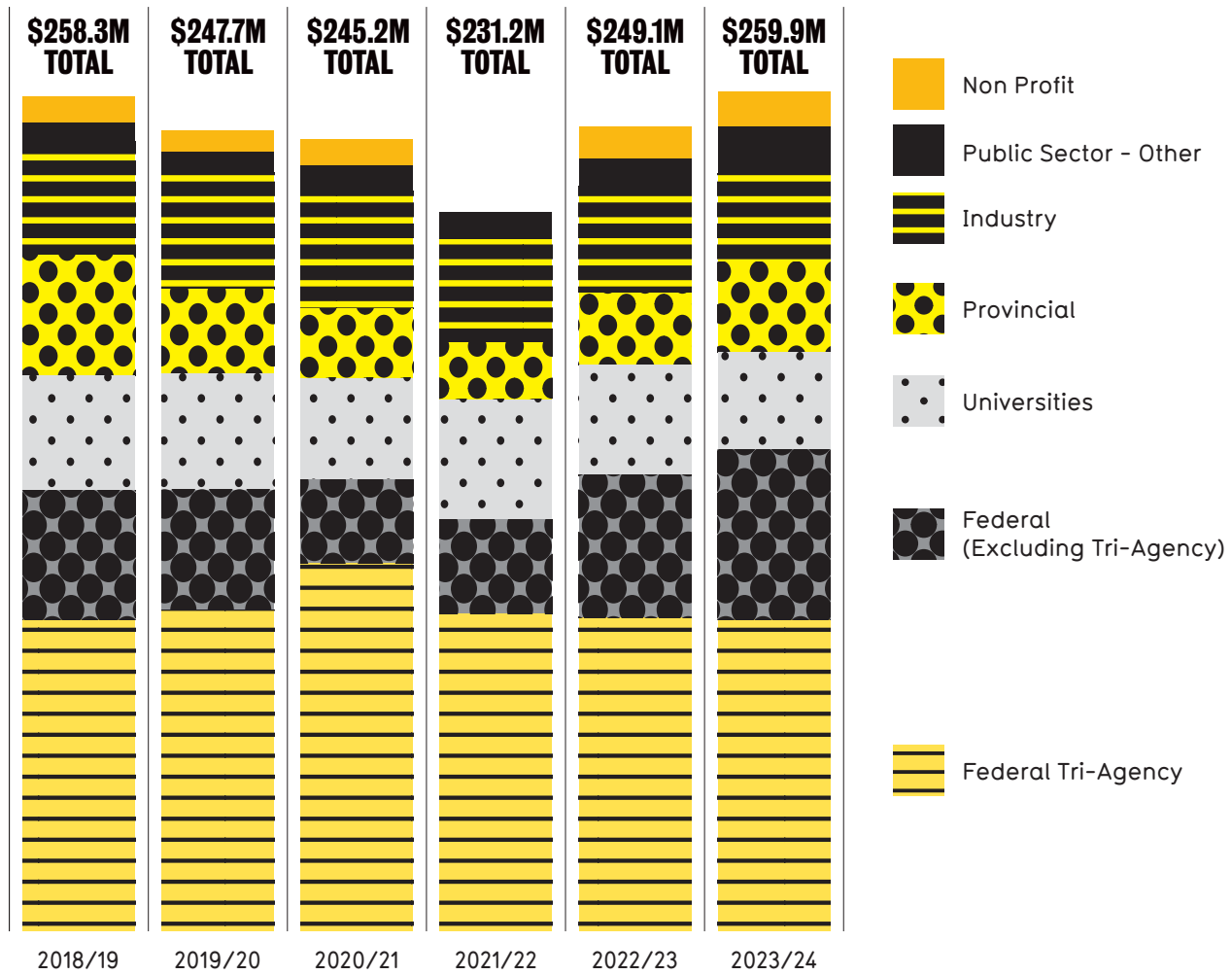
– VIVEK GOEL, PRESIDENT
AND VICE-CHANCELLOR OF THE
UNIVERSITY OF WATERLOO

LEAD FUNDAMENTAL RESEARCH AND SCHOLARSHIP: RESEARCH FUNDING

FEL beam exciting a protein,
created using AI

University of Waterloo Total Research Funding

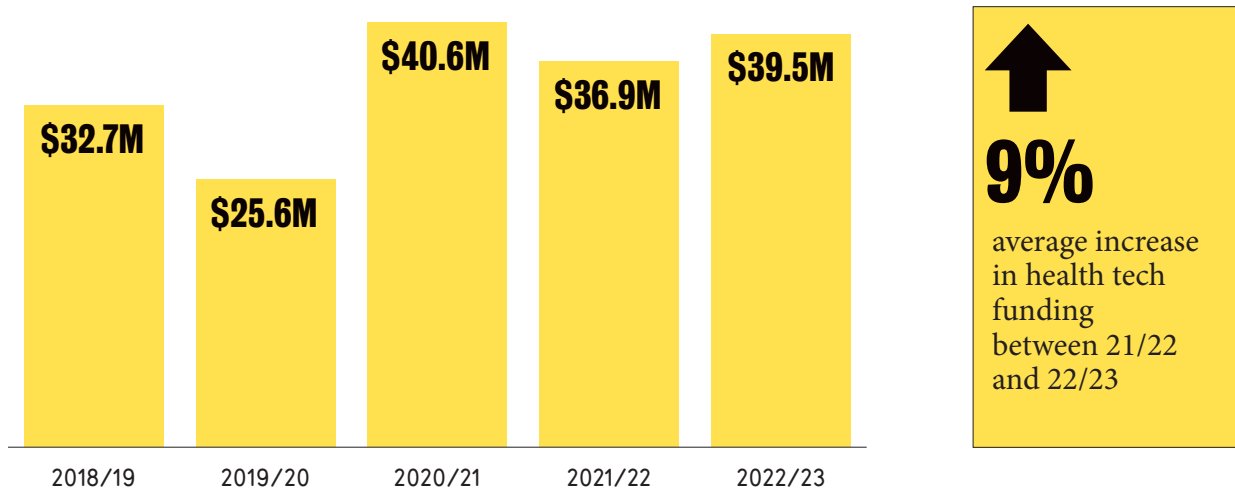
See page 34 for university data note



Sponsor Grouping	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Federal Tri-Agency	\$96.3M	\$99.5M	\$113.8M	\$98.3M	\$96.9M	\$96.5M
Federal (Excluding Tri-Agency)	\$40.2M	\$37.1M	\$26.0M	\$29.1M	\$44.3M	\$52.7M
Universities	\$35.4M	\$36.0M	\$31.4M	\$37.3M	\$34.0M	\$29.8M
Provincial	\$37.5M	\$26.1M	\$21.5M	\$17.5M	\$22.5M	\$28.0M
Industry	\$35.1M	\$36.0M	\$36.4M	\$31.8M	\$32.8M	\$27.6M
Public Sector - Other	\$5.8M	\$6.4M	\$7.8M	\$8.6M	\$8.5M	\$14.3M
Non Profit	\$7.9M	\$6.7M	\$8.2M	\$8.7M	\$10.1M	\$11.0M
Total	\$258.3M	\$247.7M	\$245.2M	\$231.2M	\$249.1M	\$259.9M

↑ 4% increase in overall research funding between 22/23 and 23/24. Source: InfoEd

University of Waterloo Health Technology Funding



See data notes for health technology funding methodology



Sylvia Jones, Deputy Premier and Minister of Health speaks at the announcement event.
Photo credit: Jordon Flemming

2024 announcement

A new hospital will be built in the University of Waterloo

David Johnston Research and Technology Park

Advancing transformational health innovation locally and globally by connecting the University of Waterloo's health and medical expertise with Regional primary care

U15 NSERC funding 23/24

University of Toronto	\$89.1M
University of British Columbia	\$83.3M
McGill University	\$65.6M
University of Alberta	\$65.0M
University of Waterloo	\$53.7M
University of Calgary	\$40.2M
Université Laval	\$36.9M
McMaster University	\$34.0M
University of Ottawa	\$31.2M
University of Western Ontario	\$30.9M
Université de Montréal	\$29.4M
Queen's University	\$25.8M
University of Saskatchewan	\$25.7M
Dalhousie University	\$24.2M
University of Manitoba	\$22.2M

Year	2019/20	2020/21	2021/22	2022/23	2023/24
Waterloo Rank	4	4	5	5	5

Source: Open Canada.
See data notes for exclusions and inclusions

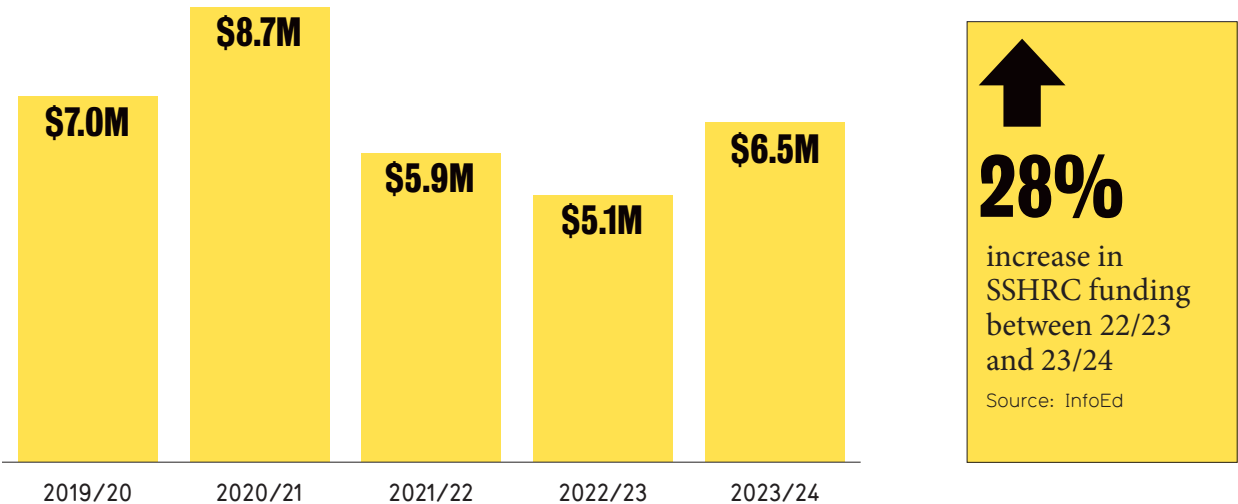
Comprehensive University CIHR Funding 2023/24

University of Victoria	\$8.7M
Simon Fraser University	\$8.2M
University of Waterloo	\$7.0M
University of Guelph	\$6.1M
York University	\$5.8M
Toronto Metropolitan University	\$5.5M
Memorial University of Newfoundland	\$4.7M
Carleton University	\$3.0M
Université du Québec à Montréal	\$2.8M
Concordia University	\$2.2M
University of Windsor	\$1.9M
University of Regina	\$1.7M
Brock University	\$1.7M
University of New Brunswick	\$0.9M
Wilfrid Laurier University	\$0.7M

Year	2019/20	2020/21	2021/22	2022/23	2023/24
Waterloo Rank	2	1	1	2	3

Source: Open access CIHR public database. This new data source reports all project funding that has been dispersed- the previous CIHR database reported all successful projects. Historic data has changed due to this new way of reporting.

University of Waterloo SSHRC Funding



SSHRC Insight Development Grants – University of Waterloo and National Success Rates

Insight Development Grants foster research in its early stages and enable the development of new research questions, as well as experimentation with new methods, theoretical approaches and/or ideas.

SSHRC Insight Development Grants	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	Average % change across all years
Waterloo # applications	22	17	22	26	32	+12%
Waterloo success rate	55%	53%	64%	42%	56%	+4%
National success rate	45%	56%	56%	48%	43%	+5%
Waterloo \$ full awards	\$672,226	\$541,853	\$1,019,970	\$656,930	\$1,131,674	+26%

Source: SSHRC public awards database

LEAD FUNDAMENTAL RESEARCH AND SCHOLARSHIP: CANADA FOUNDATION FOR INNOVATION 2023 PROJECTS

The Canada Foundation for Innovation (CFI) is a non-profit corporation that invests in research infrastructure at Canadian universities, colleges, research hospitals and non-profit research institutions.

\$30.5M Awarded to the
University of Waterloo
in the 2023 decision year

Canadian Free Electron Laser (FEL) Project

Enable energy flow monitoring through molecules and materials with applications in light harvesting and photo-control of molecular properties.

\$10,006,500

Canadian Alliance in Cold Spray Technology (CACST)

Develop Cold Spray specific powder synthesis and transformative 3D additive manufacturing including innovative coatings and parts for intelligent manufacturing.

\$8,123,420

Canadian Technology Accelerator for Digital Transformation of Manufacturing (CAN-DX)

Create, disseminate, and implement new knowledge and technologies driving the Digital Manufacturing Industry 4.0.

\$6,458,020

UPSCOPE: Understanding Geothermal Energy and Energy Geo-storage Research Laboratory

Develop low-to-intermediate temperature geothermal energy harvesting and underground energy storage experimentation.

\$2,723,302

Canadian Vision Imaging Centre (CVIC)

Enable imaging of the eye at the cellular level; the structure and function of the eye; and the integration of vision and body.

\$2,362,150

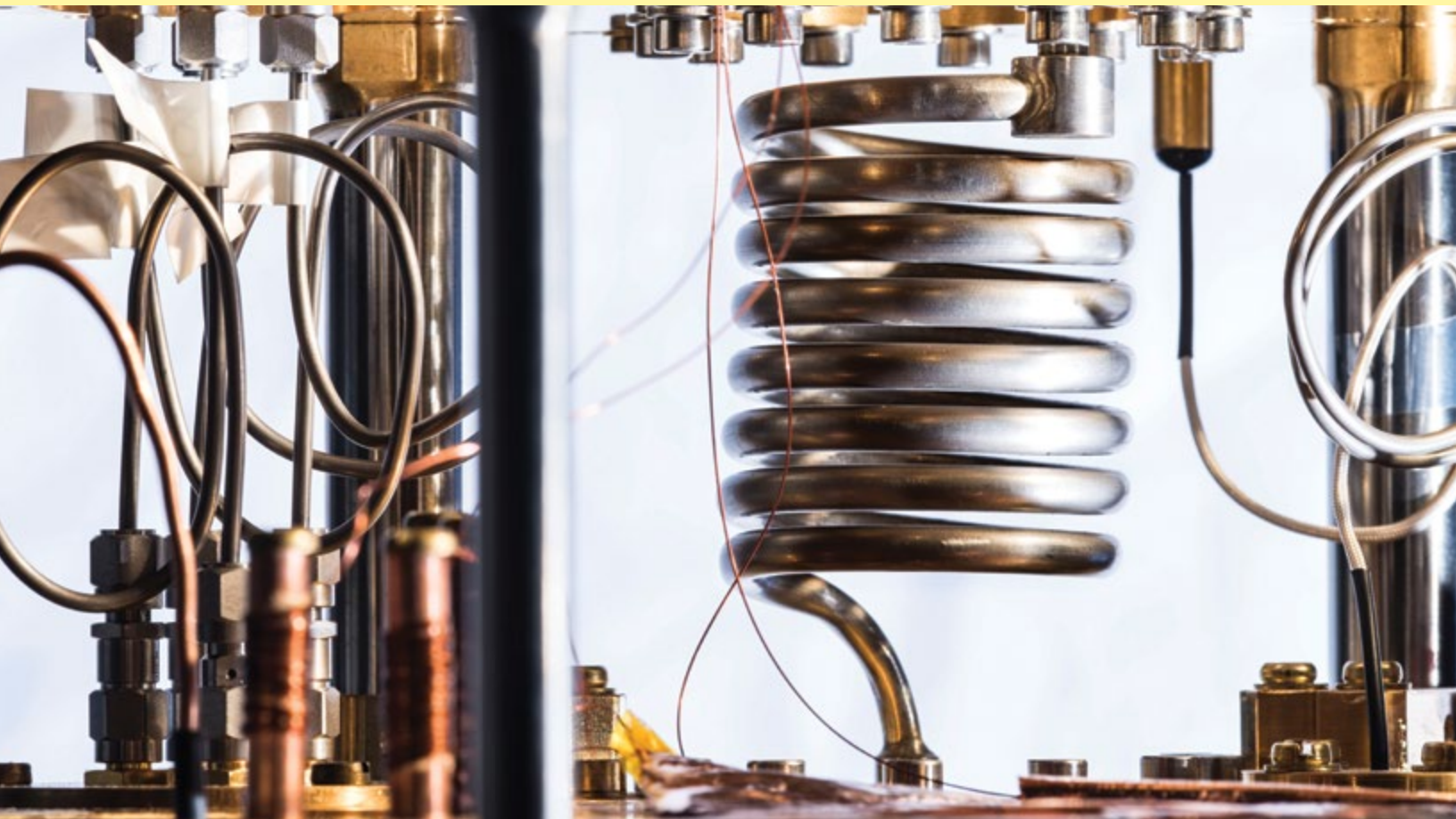
Privacy, Security, and Cryptography in Online and Physical Environments

Isolate potentially malware - laden devices without harming the privacy or security of existing users of the technologies.

\$800,000

\$ values shown reflect only the 40% CFI contribution amount

LEAD FUNDAMENTAL RESEARCH AND SCHOLARSHIP: QUANTUM RESEARCH



Two companies spun out of the University of Waterloo received funding from the federally-funded Regional Quantum Initiative. The initiative funds breakthroughs by high potential quantum companies and world-leading research centres = **\$4.3M**

High Q Technologies Inc. **\$3.7M**

Develop quantum-enabled scientific instruments for ultra-high sensitivity biophysical and chemical analysis

Foqus Technologies Inc. **\$601.9K**

Develop quantum information algorithms and machine learning techniques to enhance the sensitivity of magnetic resonance technology

Dilution fridge:
Chris Wilson's quantum systems laboratory

NSERC Alliance–Strengthening Capacity 2023

11 quantum projects = \$16M



Jonathan Baugh
\$1,481,200
Next-generation photonic source to enable quantum remote sensing and communications



Kazi Rajibul Islam
\$2,128,817
Benchmarking and optimizing a large-scale trapped ion quantum processor



Bradley Hauer
\$1,350,000
Next-generation technology to access new regimes of quantum sensing



Michael Reimer
\$1,500,000
Portable semiconductor nanowire quantum sensors with enhanced efficiency and timing resolution.



Jan Kycia
\$1,113,491
Low temperature material characterization of superconducting devices for quantum computing

\$2,500,000
Hybrid quantum repeater node for practical quantum networks and timing resolution.



Adrian Lupascu
\$1,137,724
Development of a scalable superconducting quantum computing platform based on fluxonium qubits



Germán Sciaini
\$1,480,000
Unlocking Quantum Secrets: The CanCL Initiative for Atomic-Level Characterization of Quantum Materials and Single-Photon Sources



\$1,465,706
Superconducting levitation in the quantum regime—a platform for quantum science and technology

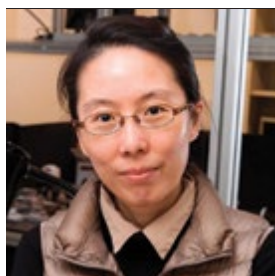


Lan Wei
\$1,690,122
Towards large-scale spin qubit quantum computers: simulation, modeling and experiment



Christopher Wilson
\$241,000
Advanced manufacturing for quantum simulation

NSERC Alliance Quantum Grants = \$1M



Na Young Kim
\$1,028,700
*Quantum Rydberg Exciton
Radars (REX-R)*

NSERC Alliance International = \$50K



Jonathan Baugh
\$25K
*Improved scalability of
silicon quantum computing
with ambipolar devices*



Adrian Lupascu
\$25K
*Quantum information
processing with multilevel
systems*

NSERC Alliance Quantum Consortia = \$9.1M



Douglas Stebila
\$4.1M
*Accelerating the transition
to quantum-resistant
cryptography*



Thomas Jennewein
\$5M
*Oeyssat User INvestigation
Team (QUINT)*

Comparative NSERC Alliance Strengthening Capacity Funding 2023

University of Waterloo	\$16.1M
The University of British Columbia	\$6.7M
Université de Sherbrooke	\$4.8M
McMaster University	\$4.7M
University of Calgary	\$3.0M
Queen's University	\$2.5M
Institut national de la recherche scientifique (INRS)	\$2.4M
University of Toronto	\$2.2M
University of Ottawa	\$1.6M
McGill University	\$1.5M
Université de Montréal	\$1.3M
École de technologie supérieure	\$1.2M
École Polytechnique de Montréal	\$0.9M
University of Windsor	\$0.8M
Toronto Metropolitan University	\$0.5M

Percentage of NSERC National Quantum Strategy Funding (2023) by Top 15 Institutions in Canada

University of Ottawa	34.93%
University of Waterloo	20.13%
The University of British Columbia	11.98%
Universite de Sherbrook	11.11%
University of Alberta	9.94%
University of Toronto	6.90%
University of Calgary	3.35%
McMaster University	0.49%
The University of Western Ontario	0.15%
Institut national de la recherche scientifique (INRS)	0.15%
Toronto Metropolitan University	0.10%
Simon Fraser University	0.10%
McGill University	0.10%
Ecole Polytechnique de Montreal	0.10%
Carleton University	0.10%

Source: National quantum funding project database – see data notes for specifics

Innovation for Defence Excellence and Security (IDEaS) funding for Institute for Quantum Computing (IQC) faculty (2023/24) = \$8.9M



David Cory
\$2,980,789
Quantum Enhanced Navigation, QuNav
 Partners: Quantum Valley, Ideas Lab, MSubs Ltd., CAE Ltd.



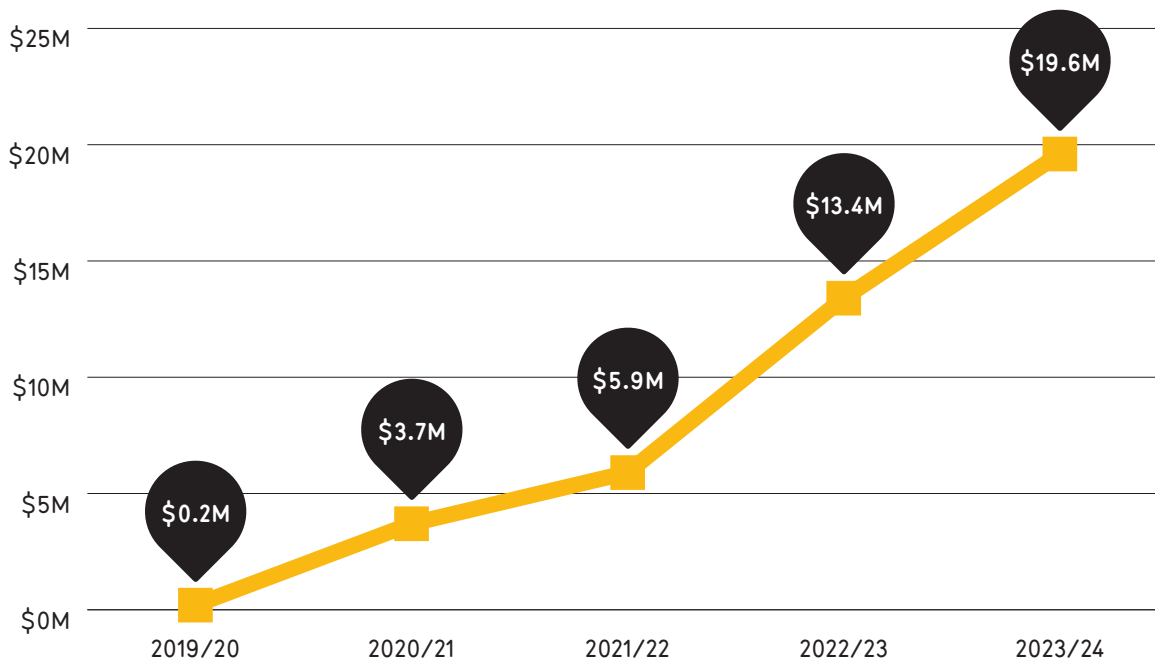
Christopher Wilson
\$3,000,000
Microwave Quantum Radar
 Partners: Qubic Inc., Zero Point Cryogenics Inc., Carleton University



Thomas Jennewein
\$2,999,436
Reliable and Agile Quantum Key Distribution Networks and Beyond
 Partners: EvolutionQ Inc., University of Calgary, RHEA Inc., Université de Sherbrooke, Stratotegic Inc. Photonic Inc., QEYnet Inc.

ADVANCE RESEARCH PARTNERSHIPS

University of Waterloo NSERC Alliance Funding



46%

increase in NSERC Alliance funding between 22/23 and 23/24 Source: InfoEd

NSERC Alliance Project Highlight

(Dec. 2023 to Dec. 2029)

Holistic Innovation in Additive Manufacturing 2.0 (HI-AM 2.0): Capitalizing on Prior Achievements and Exploring New Frontiers in Directed Energy Deposition Processes

Total award **\$6,685,177**

Total industry funding **\$1,749,038**

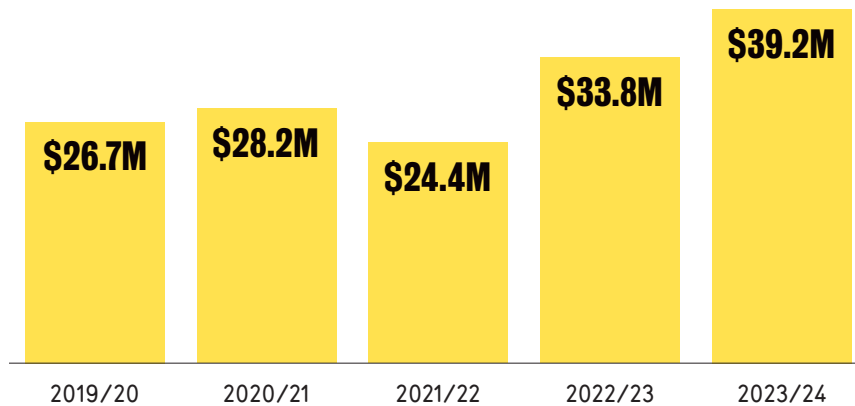
Total in-kind from industry **\$1,438,066**

NSERC alliance **\$3,498,073**

10 INDUSTRY PARTNERS

7 UNIVERSITY PARTNERS

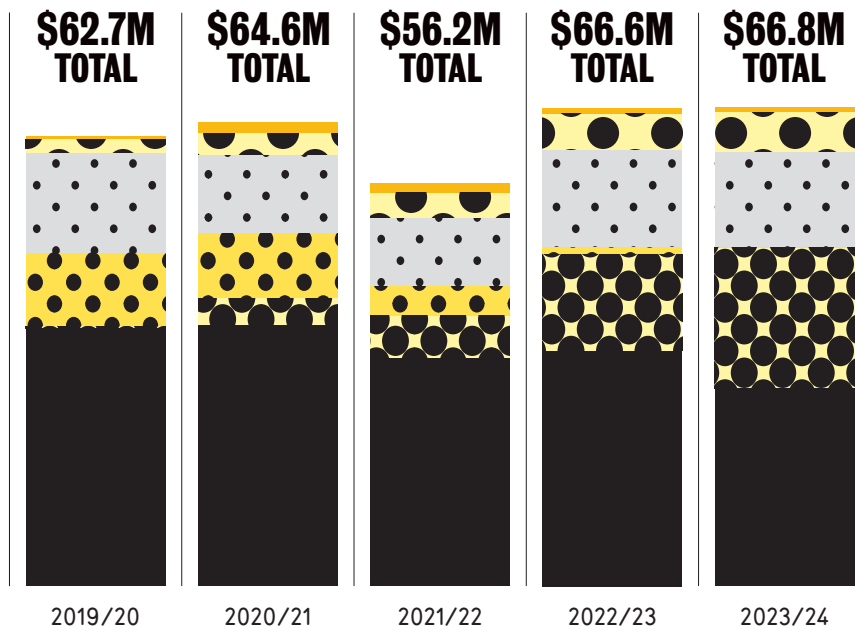
University of Waterloo Government Partnership Funding



↑
16%
increase in total Government Partnership funding between 22/23 and 23/24

Source: InfoEd—see data notes page for more information

University of Waterloo Industry and Government Matching Partnership Funding



Since 2020/21 industry funding has generally decreased due to research and telecom sector requirements. This decrease was offset substantially in 2022/23 due to the effect that a single industry partner had on funding (\$5.7M) for that year.

Source: InfoEd

	2019/20	2020/21	2021/22	2022/23	2023/24
Industry	\$36.0M	\$36.4M	\$31.8M	\$32.8M	\$27.6M
NSERC Alliance	\$0.2M	\$3.7M	\$5.9M	\$13.4M	\$19.6M
Other (Fed Dev, APC, Engage as examples)	\$14.1M	\$10.9M	\$9.5M	\$13.6M	\$13.3M
Mitacs Inc	\$1.7M	\$3.1M	\$3.6M	\$5.1M	\$5.6M
OCI	\$0.5M	\$1.5M	\$1.3M	\$0.7M	\$0.7M
NSERC - CRD	\$10.3M	\$9.1M	\$4.1M	\$1.0M	\$0.0M
Total	\$62.7M	\$64.6M	\$56.2M	\$66.6M	\$66.8M

CONVENE INTERNATIONAL PARTNERSHIPS



CONVENE INTERNATIONAL PARTNERSHIPS: WATERLOO INTERNATIONAL

Enhance international partnerships and connections

Convened

160+ PARTNERSHIP MEETINGS

Partnership meetings across

31 COUNTRIES

Hosted

40+ INTERNATIONAL DELEGATIONS

to Waterloo

Coordinated meetings across

ALL 6 FACULTIES

to explore areas of mutual research interest and collaboration

Executed

21 INTERNATIONAL AGREEMENTS

support faculty priorities to increase internationalization and facilitate inbound and outbound student mobility

Support international talent pipeline development and student mobility

Managed

6

Emerging Leaders in the America's Student Exchange scholarships

6

Canada-Association of Southeast Asian Nations Scholarships

4

ERAMUS (European Union student exchange) exchange opportunities

Develop new international opportunities

Secured and managed

\$350,000

for the Global Skills Opportunity Student Mobility Project to enable international experiences for students who identify as low-income, living with a disability, Indigenous

Established the University of Twente-Waterloo staff international experience grant to share best practices and encourage collaboration

Safety Abroad Monitoring

Count of registered trips

4940

Count of countries trips registered to

93

Percentage of undergraduate students with monitored trips

14%

ENGAGE IN RESEARCH EXCELLENCE



ENGAGE IN RESEARCH EXCELLENCE: 2023/24 NEW AND RENEWED RESEARCH CHAIRS

Canada Excellence Research Chairs (CERC) program recruits world-leading scientists to establish Canadian universities as centres of excellence and secure Canada's reputation as a global leader in research and innovation.

In 2023/24 Waterloo received two CERCs valued at \$12M over eight years.



Sara A. Hart
NEW - CERC -
Developmental Science
Strengthening expertise in developmental psychology, behavioral genetics, education and cognitive science



Renée J. Miller
NEW - CERC -
Data Intelligence
Using foundational data tools to create principled data curation solutions to ensure valid and unbiased insights

Applied Public Health Chairs (APCs) fund mid-career applied public health researchers to undertake inclusive and equitable applied research programs that tackle pressing public health challenges.

In 2023/24 Waterloo received one APC valued at \$1.5M over five years.



William Wong
NEW – Applied Public Health Chair - HIV and Sexually Transmitted and Blood-Borne Infections (STBBI)
Helping guide policy and decision-making to ultimately improve HIV/AIDS and STBBI care through interdisciplinary training in computer science, machine learning, economic evaluation and health services

ENGAGE IN RESEARCH EXCELLENCE: NEW AND RENEWED RESEARCH CHAIRS

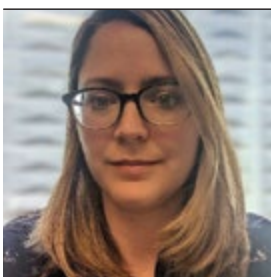
May 1, 2023 to May 1, 2024

Developing Technologies for the Future



RENEWED-CRC
Luis Ricardez-Sandoval
NSERC Tier 2
**Multiscale Modeling
and Process Systems**

*Developing new
computational tools to
design products and
systems for energy and
advanced manufacturing.*



NEW-CRC
Valerie Ward
NSERC Tier 2
Biomanufacturing

*Investigating the use
of microalgae as green
cell-factories to make
chemicals and proteins
by establishing light-
driven bioprocesses for
industrially relevant
compounds.*





Pushing the Frontiers of Knowledge



NEW-CRC
Travis Craddock
NSERC Tier 1
Quantum
Neurobiology

Providing models that describe the basic biophysical behaviour of the neuroinflammatory cascade.



NEW - CRC
Aukosh Jagannath
NSERC Tier 2
Mathematical
Foundations of Data
Science

Using data science, high dimensional statistics, and average case analysis for solving high dimensional non-convex optimization problems.



RENEWED - CRC
Christopher Eliasmith
NSERC Tier 1
Theoretical
Neuroscience

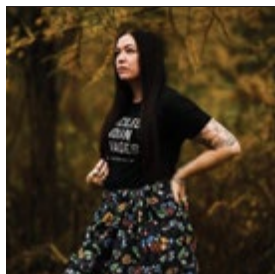
Developing a mathematical theory by building biologically-realistic models to understand brain process information.



NEW - CRC
Ruodu Wang
NSERC Tier 1
Quantitative Risk
Management

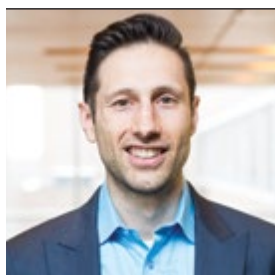
Working across a wide variety of stakeholders in the financial industry to design risk management tools and procedures.

Understanding and Enhancing Human Experience



NEW-CRC
SSHRC Tier 2
Talena Atfield
Tentewatenikhra'khánion
(We Will Put Our Minds Together)

Contextualizing life at Ohswe:ken (Six Nations) during the first quarter of the 20th Century.



RENEWED-CRC
Andrew Bauer
SSHRC Tier 2
Taxation, Governance and Risk

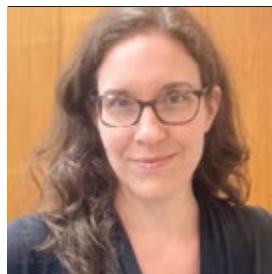
Examining the influence of agency issues on tax planning, including governance mechanisms.



NEW-CRC
Lai-Tze Fan
SSHRC Tier 2
Technology and Social Change

Identifying and breaking down the unseen social implications of technology through the use of data-driven research on AI-biased design and production.

Accelerating Sustainability



RENEWED-CRC
Laura Hug
NSERC Tier 2
Environmental Biology

Defining microbial diversity at contaminated sites and identifying currently unknown metabolic functions through sequencing DNA and RNA.



NEW-CRC
Chantel Markle
NSERC Tier 2
Wildlife Ecohydrology and Global Change

Studying the effects of climate-mediated disturbances on habitat use and function and developing techniques to detect and predict changes in wildlife resilience.



NEW-CRC
Tizazu Mekonnen
NSERC Tier 2
Sustainable Multiphase Polymers

Creating new biocatalyst technology for biodegradable polymers and sustainable antimicrobial materials for the agri-food industry.

Advancing Health and Well-being



NEW-CRC
Zahid Butt
CIHR Tier 2
Interdisciplinary
Research for Pandemic
Preparedness

Understanding 'syndemics,'—those interrelated interactions between diseases and social and behavioural factors that result in adverse consequences.



RENEWED-CRC
Mark Ferro
CIHR Tier 2
Youth Mental Health

Investigating the epidemiology, trajectories and mechanisms that lead to childhood multimorbidity to identify at-risk youth and inform prevention and intervention efforts to eliminate childhood multimorbidity.



NEW-CRC
Kaylena Ehgoetz
Martens
CIHR Tier 2
Gait and
Neurodegeneration

Investigating the relationship between walking behaviour and neurodegeneration with the goal of understanding the complexity of walking to identify at-risk individuals and track their progression.





SUPPORT TRANSFORMATIVE RESEARCH

SUPPORT TRANSFORMATIVE RESEARCH: INCLUSIVE RESEARCH



Provide specialized EDI advice for research grant proposals:

- 200+ specialized consultations on research equity and Indigenous research
- 200+ specialized grant application reviews
- Over \$1.3 million in Indigenous research funding supported

Support researchers in developing their inclusive research capacity:

- 40+ training sessions including the launch of the “Building Inclusive Research Capacity (BIRC)” Program which offers five core courses every semester to all researchers including student researchers
- Launched the “A Better First Draft (ABFD)” Program to support faculty in building their understanding of inclusion in their research and translating this into their grant applications

Collaborate with EDI research partners:

- Continue to lead the CRC Equity Action Plan update
- Co-founded and continue to lead a national dialogue through the Network of Indigenous Research Administrators (NIRA) from post-secondary institutions across Canada
- Continue to work with the Office of Indigenous Relations to establish research supports to Indigenous data sovereignty, project management and community connection.



UNIVERSITY OF
WATERLOO



SUPPORT TRANSFORMATIVE RESEARCH: SAFEGUARDING RESEARCH

The University of Waterloo’s Safeguarding Research team works collaboratively across campus to ensure that every faculty member receives assistance with understanding and implementing research security guidelines in their research portfolios.

Internal Research Security Collaborators

- University of Waterloo Departments and faculty members
- Procurement and Contract Services
- Information Technology Services
- Graduate Studies and Postdoctoral Affairs
- Waterloo Centres and Institutes

External Collaborators

- Ontario Community of Practice for Research Security and the U15
- Ministry of Colleges and Universities
- Ontario Solicitor General
- Public Safety and Emergency Preparedness of Canada
- Global Affairs Canada
- Department of National Defence
- NSERC, CIHR, SSHRC and CFI

International Collaborators

United States

- Stanford University
- Harvard University
- Massachusetts Institute of Technology
- Texas A&M University

United Kingdom

- University of London
- Queen Mary University of London

European Union

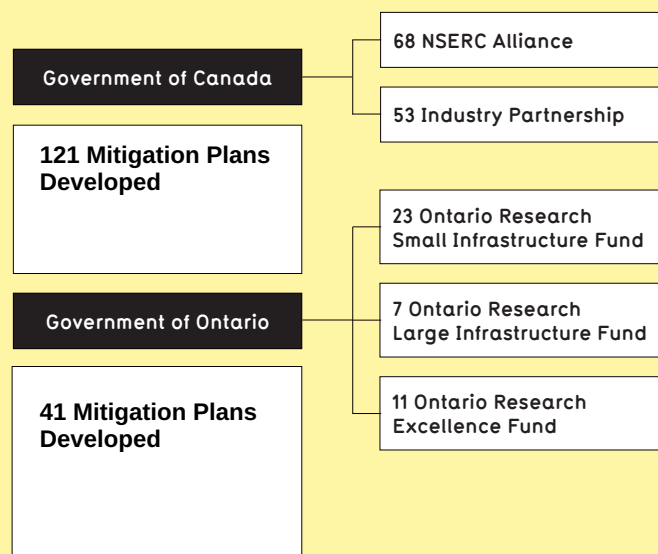
- Technical University of Munich
- Dutch Embassy Representatives

Japan

- Government Representatives

Grant-related security risk mitigation plans developed and/or reviewed, 23/24

The Safeguarding Research Team provides extensive risk mitigation services that ensure faculty grant applications successfully move past the security risk stage.

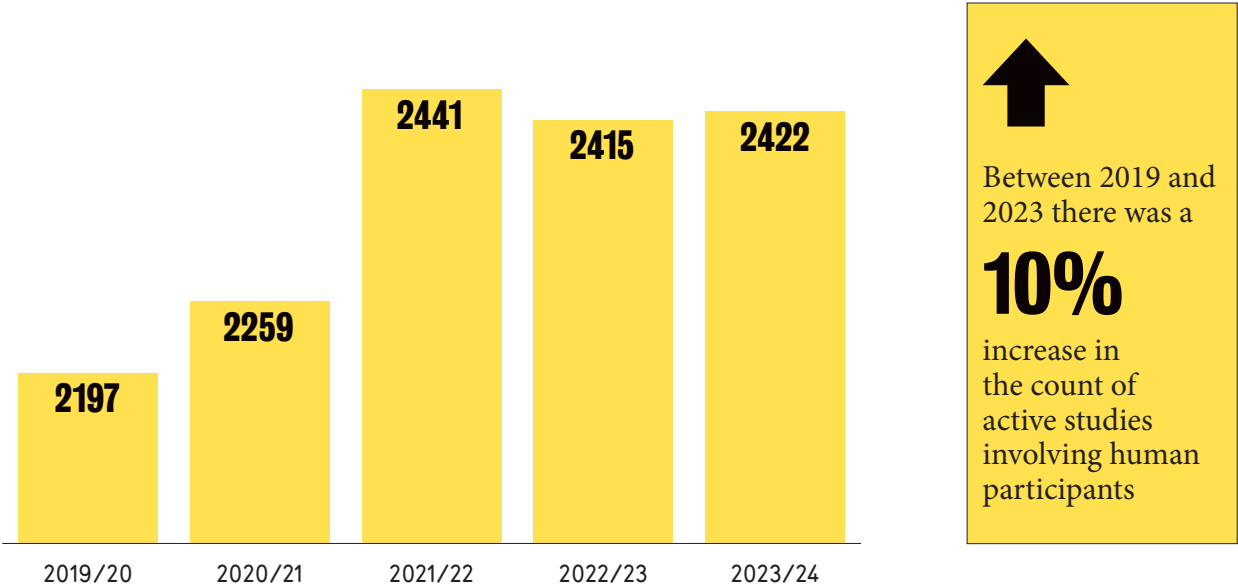


SUPPORT TRANSFORMATIVE RESEARCH: RESEARCH ETHICS

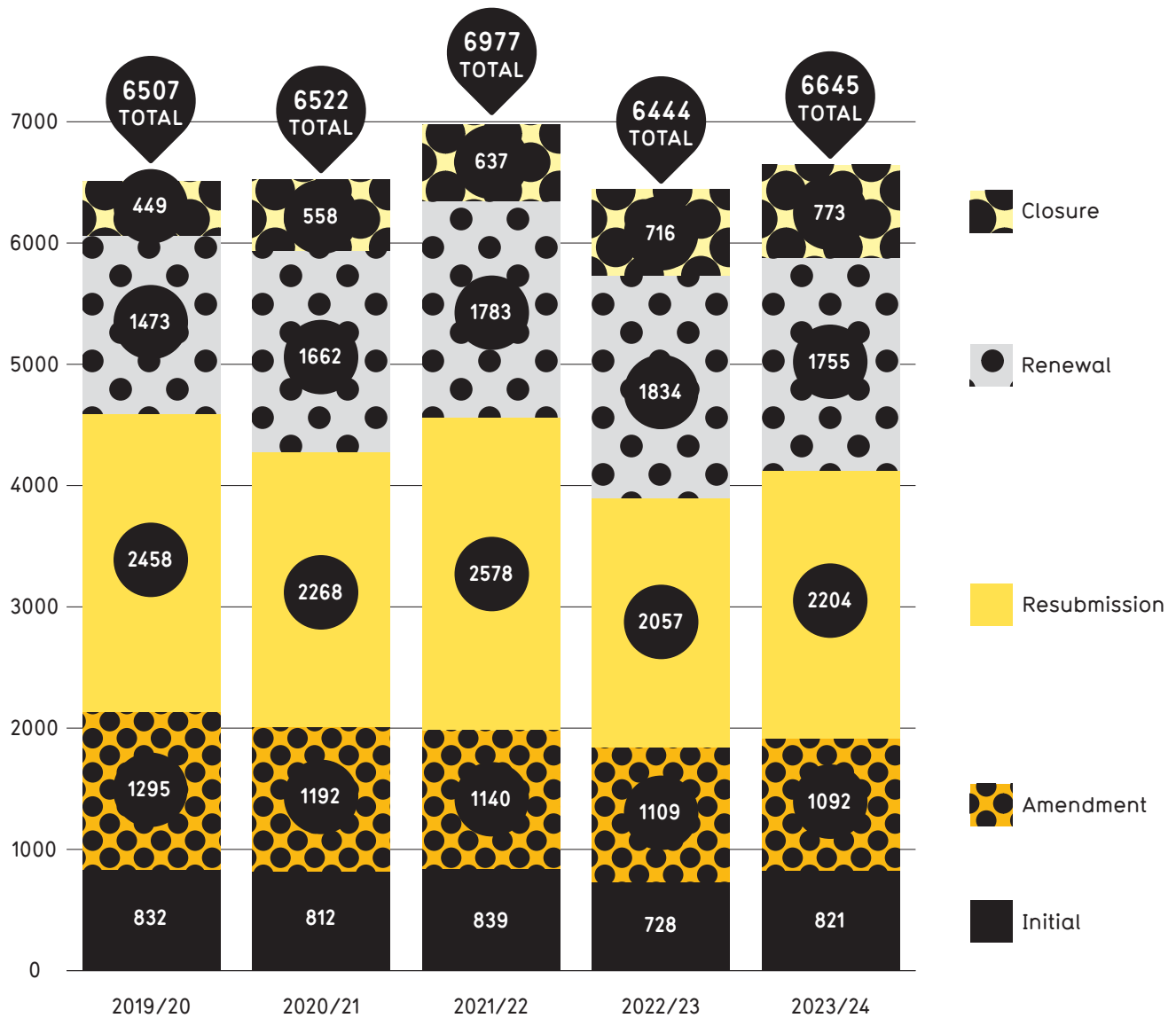
All ethics reviews are handled in a timely manner and faculty and students are supported through the entire research cycle from initial submission to study closure. More than 6500 reviews are conducted annually.






- Waterloo’s Research Ethics Boards (REB) and the Office of Research Ethics (ORE) are committed to supporting faculty, staff, and students with their research.
- Collective aim is to ensure research conducted under the auspices of Waterloo is done ethically and contributes positively to society.
- ORE is a central support for researchers navigating complex research-related ethical issues.
- The REBs and ORE are proud to be part of the advancement of scientific and scholarly progress while cultivating a culture of ethical and responsible research practice.

Number of active studies with human participants per year



Number of ethics protocol submissions by type and year



Types of Protocol Submissions	2019/20	2020/21	2021/22	2022/23	2023/24
 Closure	449	588	637	716	773
 Renewal	1473	1662	1783	1834	1755
 Resubmission	2458	2268	2578	2057	2204
 Amendment	1295	1192	1140	1109	1092
 Initial	832	812	839	728	821
Total	6507	6522	6977	6444	6645

DATA NOTES

Page 5

- **U15 Universities globally producing investment-backed undergraduate entrepreneurs**

Source: Pitchbook annual ranking of Universities: Top 100 colleges ranked by startup founders

- **23/24 University of Waterloo Entrepreneur Program Overview – Internal tracking**

- **U15 Universities globally producing investment-backed undergraduate female entrepreneurs**

Source: PitchBook Universities: Female founders edition

Page 6

- **Growth of University of Waterloo Campus Startup Teams and Percentage of 2023 Campus Startup Teams by Type**

Source: Internal Velocity tracking

Page 7

- **Expected outcomes of the Innovation Arena and its partnerships**

Source: Initial key performance indicator targets set out for Federal Economic Development Agency funding

Page 9

- **University of Waterloo Total Research Funding**

Source: Internal pre-award database - InfoEd – Fiscal years are Mar 31 to April 1.

Data note- Universities funding group includes Waterloo internal funding + non-University funding that flows through Universities (i.e. CFI grants at other Universities on which Waterloo is a co-applicant)

Page 10

- **University of Waterloo Health Research and Technology**

Source: CIHR + NSERC + SSHRC + CFI public databases using a combination of keywords

Page 11

- **U15 NSERC Funding 2023/24**

Source: Government of Canada NSERC public funding database

Exclusions:

Alexander Graham Bell Canada Graduate Scholarships – Doctoral

Alexander Graham Bell Canada Graduate Scholarships – Master’s

Canada First Research Excellence Fund

Canadian Graduate Scholarships Foreign Study Supplements

NSERC Student Ambassadors - Vanier Canada Graduate Scholarship Tri-Council – Doctoral 3 years

Inclusions:
NSERC CERCS and CRCs

- **Comprehensive University CIHR Funding 2023/24**

Source: Government of Canada CIHR grants and awards open government database

Page 12

- **University of Waterloo SSHRC Funding**

Source: Internal pre-award database - InfoEd – Fiscal years are Mar 31 to April 1.

- **SSHRC Insight Development Grants – Waterloo and National Success Rates**

Source: Government of Canada SSHRC public competition statistics

Page 13

- **Canada Foundation for Innovation 2023 Projects**

Source: Canada Foundation for Innovation Funded projects and results public database

Page 15

- **NSERC Alliance—Strengthening Capacity**

Source: Government of Canada NSERC funded projects database

Page 16

- **Percentage of NSERC National Quantum Strategy Funding (2023) by Top 15 Institutions in Canada**

Source: Government of Canada NSERC Innovate/National Quantum Strategy– data included: Alliance International quantum – Alliance quantum – Quantum consortia – Quantum create

- **Innovation for Defence Excellence and Security (IDEaS) funding**

Source: Government of Canada DND IDEaS public funded projects database

Page 18

- **University of Waterloo NSERC Alliance Funding and NSERC Alliance Project Highlight**

Source: Internal pre-award database - InfoEd – Fiscal years are Mar 31 to April 1.

Page 19

• University of Waterloo Government Partnership Funding and University of Waterloo Industry and Government Matching Partnership Funding

Source: Internal pre-award database - InfoEd - Fiscal years are Mar 31 to April 1.

Government match of industry funding shows the Government portion of matching/leveraged funds for the following project sponsors:

Communitech

OCI (Ontario Centre for Innovation)

Ministry of Colleges & Universities (MCU) - ORF-RE (Ontario Research Fund - Research Excellence)

APC (Automotive Partnerships Canada)

NSERC: Engage Grant | Engage Plus Grants

I2I (Idea to Innovation Program)

Interaction Grant

IRC (Industrial Research Chairs Program)

Other

Partnership Workshops Grants

Strategic Project Grants Program (STP)

CDE

CRD (Collaborative Research and Development)

Alliance Advantage Grants

Alliance Consortia Quantum Grants

Alliance International Grants

Alliance Quantum Grants

Alliance Society Grants

Alliance Grants - Canadian Nuclear Safety Commission (CNSC) - Small Modular Reactors

Alliance Grants - CSE- Research Communities

Alliance Grants - Mission Grants

Alliance Grants - National Science Foundation

Alliance Grants - NOVA Program

Alliance Grants - NRCAN - Small Modular Reactors

Alliance Grants - SSHRC Sustainable Agriculture Research Initiative

NSERC - NSF - Global Centres

DND/NSERC RSCH PARTNERSHIP PGM

SSHRC - Partnerships | Strategic Grants

OCE - CMM | CCIT | CPRO | CEET | CE | INC/CCR

FedDev - AMF (Advanced Manufacturing Fund) | ARC (Applied Research & Commercialization) | ICP (Investing in Commercialization Partnerships) | TDP (Technology Development Program) | Other

MITACS - NCE | non NCE | Mitacs Inc

All NCE Sponsor Types

Horizon Europe

Page 21

- All Waterloo International data comes from internal tracking interfaces

Page 29

- All Equity, Diversity and Inclusion (EDI) data comes from internal tracking interfaces

Page 31

- Safeguarding Research grant-related security risk mitigation plan and negative decision data from internal tracking interfaces

Page 32 and 33

- All Ethics data comes from internal tracking interfaces.

Acknowledgements: The content of this report has been compiled with the assistance of senior leaders across all relevant portfolios in the Office of Research and International.

Report date: November 2024

Suggested citation: Office of the Vice-President, Research and International Annual Senate Report, November, 2024

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uwaterloo.ca

Senate Graduate and Research Council

For Approval

Open Session

To: Senate

Sponsors and Presenters: Charmaine Dean
Vice-President, Research & International
Clarence Woudsma
Interim Co-Associate Vice-President, Graduate Studies and
Postdoctoral Affairs

Date of Meeting: January 27, 2025

Agenda Item: **5.1 Senate Graduate and Research Council: Faculty of Engineering – Major Modifications**

Recommendation/Motion

Motion: That Senate approve the following major modifications for plans in civil engineering, electrical and computer engineering, and mechanical and mechatronics engineering, as presented and effective May 1, 2025.

Summary

[Senate Graduate and Research Council](#) met on November 18, 2024 and agreed to forward the following items to Senate for approval as part of the regular agenda.

- 1) Department of Civil Engineering:
 - a. MEng in Civil Engineering: Updating the MEng degree requirements to include four new Graduate Specializations.
 - b. MEng in Civil Engineering - Co-operative Program: Updating the MEng degree requirements to include four new Graduate Specializations.
- 2) Department of Electrical and Computer Engineering:
 - a. MEng in Electrical and Computer Engineering: Updating the degree requirements to include a new Graduate Specialization in Quantum Engineering.
 - b. MEng in Electrical and Computer Engineering - Co-operative Program: Updating the degree requirements to include a new Graduate Specialization in Quantum Engineering.
- 3) Department of Mechanical and Mechatronics Engineering:
 - a. MEng in Mechanical and Mechatronics Engineering: Updating the MEng degree requirements to include three new Graduate Specializations. Changing the name of the current "Green Energy" Graduate Specialization to "Sustainable Energy" and updating the list of required/elective courses associated with the specialization.

- b. MEng in Mechanical and Mechatronics Engineering - Co-operative Program:
Updating the MEng degree requirements to include three new Graduate Specializations. Changing the name of the current "Green Energy" Graduate Specialization to "Sustainable Energy" and updating the list of required/elective courses associated with the specialization.

Jurisdictional Information

This item is being submitted to Senate in accordance with [Senate Bylaw 2](#), section 4.03: "Consider, study and review all proposals for new graduate programs, the deletion of graduate programs, major changes to existing graduate programs, arrange for internal appraisals as the council shall see fit, and make recommendations to Senate thereon."

Governance Path

Engineering Faculty Council approval date (mm/dd/yy): 10/15/24

Senate Graduate and Research Council approval date (mm/dd/yy): 11/18/24

Documentation Provided

Appendix: Proposed Changes

MEng in Civil Engineering

Master of Engineering (MEng) in Civil Engineering

Under Review | Spring 2025

Proposal Information

Status

Active

Workflow Status

In Progress

SGRC, Senate Graduate and Research Council (SGRC)

expand ▲

Waiting for Approval | Approval Delegate(s)

Mike Grivicic

Tim Weber-Kraljevski

Diana Goncalves

Melanie Figueiredo

Ashley Day

Changes

- Coursework Option: Course Requirements
- Effective Term and Year
- Admin Notes
- Graduate Specializations

Effective Date and Career

Career

Graduate

Important!

Proposed

Effective Term and Year ⓘ

Spring 2025

Existing

Effective Term and Year ⓘ

Spring 2024

Proposal Details

Proposal Type ⓘ

Change

Academic Unit Approval

09/19/2024

Quality Assurance Designation ⓘ

Major Modification

Major Modification Categories

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

Is there an impact to existing students? ⓘ

Yes

Impact on Existing Students

Current MEng students who satisfy the degree requirements of one the new Graduate Specializations may obtain the Graduate Specialization by completing/submitting a program change form prior to degree completion.

Is the credential name changing?

No

Graduate Co-operative Requirements

Not Applicable

Internship Requirements

Not Applicable

Rationale and Background for Change(s)

Updating the MEng degree requirements to include four new Graduate Specializations: These new Graduate Specializations will add structure to the MEng programs by allowing students to specialize in certain areas of study and receive recognition for that specialization from the Department which is valued when searching for a job in industry. These changes follow the recommendations of the external reviewers of the 2023 Civil and Environmental Engineering (CEE) Institutional Quality Assurance Process (IQAP) cyclical review cyclical review.

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Graduate Field of Study

Civil and Environmental Engineering

Faculty

Faculty of Engineering

Program/Plan Name

Master of Engineering (MEng) in Civil Engineering

Graduate Credential Type

Master's

Accelerated Program

Not applicable

Study Options (New)

Coursework

Program Types

Admit Term(s)

Fall
Winter
Spring

Delivery Mode

On-campus

Delivery Mode Information**Length of Program**

- Full-time: 4 terms (16 months)
- Part-time: 8 terms (32 months)

Registration Option(s)

Full-time
Part-time

Registration Options Information**Graduate Research Fields**

Proposed

Graduate Specializations

- Architectural Engineering
- Environmental and Water Resources Engineering
- Sustainable Structural Systems
- Transportation Engineering

Existing

Graduate Specializations**Additional Program Information**

- The University of Waterloo does not provide funding for MEng in Civil Engineering students, and the candidates are expected to be self-supporting.

Admissions

Admission Requirements: Minimum Requirements ⓘ

- An Honours Bachelor's degree (or equivalent) with a 75% standing.
- Graduate Record Examination (GRE) score (only for those applicants who completed their degree outside of Canada and the United States).
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 2
- Type of references: academic or professional

Requirements Information

Graduate Degree Requirements ⓘ

- Students must complete the course requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).

Coursework Option: Course Requirements

No Rules

Proposed

Coursework Option: Course Requirements

- Students must complete 8 one-term graduate level courses (0.50 unit weight) taken from the 500, 600 and 700 series courses (or courses acceptable for graduate credit).
- At least 4 of the 8 required courses must be taken within the Department of Civil and Environmental Engineering.
- An English for Multilingual Speakers (EMLS) technical/professional writing course for Engineers is required for all students who were not English Language Proficiency (ELP) exempt at the time of admission.
- A maximum of 2 500 level courses may be counted for credit.
- The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure).
- At least half of the courses used for credit must normally be Faculty of Engineering courses.
- Students in the MEng in Civil Engineering program may choose to pursue a maximum of two of the following Graduate Specializations:
 1. Architectural Engineering
 2. Environmental and Water Resources Engineering
 3. Sustainable Structural Systems
 4. Transportation Engineering
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Civil Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for the Graduate Specializations are described below.

1. Graduate Specialization in Architectural Engineering

- To receive the Graduate Specialization in Architectural Engineering, students must successfully complete AE 601 Comprehensive Building Design Studio, at least 2 compulsory courses and 1 elective course. Alternatively, students have the option to complete 4 courses from the compulsory courses list. Note: If students have already successfully completed the compulsory courses, students must complete alternate courses that are approved by the Department Associate Chair, Graduate Studies.
 - Compulsory courses:
 - AE 601 Comprehensive Building Design Studio
 - Choose at least 2 from the following list:
 - ARCH 642 Modernism to the 21st Century
 - CIVE 507 Building Science and Technology
 - CIVE 630 Advanced Building Energy Analysis
 - Elective courses (choose at least 1 from the following list):
 - ARCH 684 Special Topics in Architecture
 - CIVE 505 Structural Dynamics
 - CIVE 512 Rehabilitation of Structures
 - CIVE 596 Construction Engineering
 - CIVE 601 Risk and Reliability
 - CIVE 602 Prestressed Concrete
 - CIVE 603 Reinforced Concrete Mechanics and Design
 - CIVE 604 Advanced Structural Steel Design
 - CIVE 622 Finite Element Analysis

- CIVE 700 Topics in Structural Engineering: Topic 15 Earthquake Engineering
- CIVE 700 Topics in Structural Engineering: Topic 25 Timber Design
- CIVE 700 Topics in Structural Engineering: Topic 27 Design of Structural Concrete Systems
- CIVE 700 Topics in Structural Engineering: Topic 33 Smart Structure Technology
- CIVE 700 Topics in Structural Engineering: Topic 34 Scientific Machine Learning for Engineers
- CIVE 700 Topics in Structural Engineering: Topic 35 Fire and Structures
- CIVE 700 Topics in Structural Engineering: Topic 36 Sustainable Buildings and Environment
- CIVE 700 Topics in Structural Engineering: Topic 39 Circular Engineering and the Built Environment
- CIVE 704 Bridge Design
- CIVE 710 Advanced Project Management
- CIVE 790R Master of Engineering Project
- ME 671 Fundamental Fire Dynamics
- ME 672 Advanced Fire Dynamics
- ME 673 Fire Modeling
- ME 656 Advanced HVAC Systems, Equipment and Energy Efficiency
- SYDE 532 Introduction to Complex Systems

2. Graduate Specialization in Environmental and Water Resources Engineering

- To receive the Graduate Specialization in Environmental and Water Resources Engineering, students must successfully complete at least 2 compulsory courses and 2 elective courses. Alternatively, students have the option to complete 4 courses from the compulsory courses list.
 - Compulsory courses (choose at least 2 from the following list):
 - ENVE 573 Contaminant Transport
 - ENVE 577 Engineering for Solid Waste Management
 - ENVE 585 Air Quality Engineering & Impacts
 - CIVE 671 Aquatic Chemistry
 - CIVE 680 Water Management
 - Elective courses (choose 2 from the following list):
 - CIVE 583/ENVE 583 Design of Urban Water Systems
 - CIVE 670 Physico-Chemical Processes of Water and Wastewater Treatment
 - CIVE 682 Free Surface Hydraulics
 - CIVE 770 Topics in Environmental Engineering: Topic 24 River Restoration
 - CIVE 770 Topics in Environmental Engineering: Topic 41 Atmospheric Emissions to Impacts
 - CIVE 770 Topics in Environmental Engineering: Topic 45 Environmental Fate of Organic Pollutants
 - CIVE 770 Topics in Environmental Engineering: Topic 53 Environmental and Water Resources Simulation Model Calibration
 - CIVE 771 Biological Wastewater Treatment: Theory and Practice
 - CIVE 781 Principles of Hydrologic Modelling
 - CIVE 790R Master of Engineering Project
 - EARTH 691 Special Studies for MSc Students: Topic 159 Geothermal Energy
 - EARTH 691 Special Studies for MSc Students: Topic 161 Energy Geomechanics

3. Graduate Specialization in Sustainable Structural Systems

- To receive the Graduate Specialization in Sustainable Structural Systems, students must successfully complete at least 2 compulsory course and 2 elective courses. Alternatively, students have the option to complete 4 courses from the compulsory courses list.
 - Compulsory courses (choose at least 2 from the following list):
 - CIVE 505 Structural Dynamics
 - CIVE 507 Building Science and Technology
 - CIVE 596 Construction Engineering
 - CIVE 601 Engineering Risk and Reliability
 - CIVE 622 Finite Element Analysis
 - Elective courses (choose 2 from the following list):

- CIVE 512 Rehabilitation of Structures
- CIVE 602 Prestressed Concrete
- CIVE 603 Reinforced Concrete Mechanics and Design
- CIVE 604 Advanced Structural Steel Design
- CIVE 700 Topics in Structural Engineering: Topic 15 Earthquake Engineering
- CIVE 700 Topics in Structural Engineering: Topic 21 Building Energy Analysis
- CIVE 700 Topics in Structural Engineering: Topic 25 Timber Design
- CIVE 700 Topics in Structural Engineering: Topic 27 Design of Structural Concrete Systems
- CIVE 700 Topics in Structural Engineering: Topic 33 Smart Structure Technology
- CIVE 700 Topics in Structural Engineering: Topic 34 Scientific Machine Learning for Engineers
- CIVE 700 Topics in Structural Engineering: Topic 35 Fire and Structures
- CIVE 700 Topics in Structural Engineering: Topic 36 Sustainable Buildings and Environment
- CIVE 700 Topics in Structural Engineering: Topic 39 Circular Engineering and the Built Environment
- CIVE 710 Advanced Project Management
- CIVE 790R Master of Engineering Project

4. Graduate Specialization in Transportation Engineering

- To receive the Graduate Specialization in Transportation Engineering, students must successfully complete at least 2 compulsory courses and 2 elective courses. Alternatively, students have the option to complete 4 courses from the compulsory courses list.
 - Compulsory courses (choose at least 2 from the following list):
 - CIVE 542 Pavement Structural Design
 - CIVE 640 Urban Transportation Planning Models: Principles & Applications
 - CIVE 641 Advances in Public Transportation Planning, Operations & Control
 - CIVE 642 Pavement Design and Management I
 - CIVE 643 Fundamentals of Traffic Flow Theory
 - Elective courses (choose 2 from the following list):
 - CIVE 644 Innovative and Sustainable Infrastructure Materials
 - CIVE 645 Modeling Transportation, Land Use and Spatial Economics
 - CIVE 646 Computer Applications in Transportation Engineering
 - CIVE 742 Pavement Design and Management II

Existing

Coursework Option: Course Requirements

- Students must complete 8 one-term graduate level courses (0.50 unit weight) taken from the 500, 600 and 700 series courses (or courses acceptable for graduate credit).
- At least 4 of the 8 required courses must be taken within the Department of Civil and Environmental Engineering.
- An English for Multilingual Speakers (EMLS) technical/professional writing course for Engineers is required for all students who were not English Language Proficiency (ELP) exempt at the time of admission.
- A maximum of 2 500 level courses may be counted for credit.
- The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure).
- At least half of the courses used for credit must normally be Faculty of Engineering courses.

Coursework Option: Milestone Requirements

Notes

- Department of Civil and Environmental Engineering website
- Master of Engineering (MEng) in Civil Engineering future students program page

Workflow Information

Workflow Path ⓘ

Committee approvals

Faculty/AFIW Path(s) for Workflow ⓘ

Faculty of Engineering

Senate Workflow

Senate Regular

Dependencies

Dependent Courses and Programs/Plans

PREREQUISITES

▼ BE 605 - Project Management	View Courses >
▼ BE 603 - Operations and Supply Chain Management	View Courses >
▼ BE 602 - Data Analysis and Management	View Courses >
▼ BE 606 - Entrepreneurship and Innovation	View Courses >
▼ BE 601 - Introduction to Financial and Managerial Accounting	View Courses >
▼ BE 604 - Marketing Management	View Courses >
▼ BE 600 - Management and Leadership	View Courses >
▼ BE 610 - Special Topics in Business and Entrepreneurship	View Courses >

MEng in Civil Engineering-Co-op Master of Engineering (MEng) in Civil Engineering - Co- operative Program (direct entry)

Under Review | Spring 2025

Proposal Information

Status

Active

Workflow Status

In Progress

SGRC, Senate Graduate and Research Council (SGRC)

expand ▲

Waiting for Approval | Approval Delegate(s)

Mike Grivicic

Tim Weber-Kraljevski

Diana Goncalves

Melanie Figueiredo

Ashley Day

Changes

- Coursework Option: Course Requirements
- Effective Term and Year
- Admin Notes
- Graduate Specializations

Effective Date and Career

Career

Graduate

Important!

Proposed

Effective Term and Year ⓘ

Spring 2025

Existing

Effective Term and Year ⓘ

Fall 2024

Proposal Details

Proposal Type ⓘ

Change

Academic Unit Approval

09/19/2024

Quality Assurance Designation ⓘ

Major Modification

Major Modification Categories

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

Is there an impact to existing students? ⓘ

Yes

Impact on Existing Students

Current MEng students who satisfy the degree requirements of one the new Graduate Specializations may obtain the Graduate Specialization by completing/submitting a program change form prior to degree completion.

Is the credential name changing?

No

Graduate Co-operative Requirements

No

Internship Requirements

Not Applicable

Rationale and Background for Change(s)

Updating the MEng degree requirements to include four new Graduate Specializations: These new Graduate Specializations will add structure to the MEng programs by allowing students to specialize in certain areas of study and receive recognition for that specialization from the Department which is valued when searching for a job in industry. These changes follow the recommendations of the external reviewers of the 2023 Civil and Environmental Engineering (CEE) Institutional Quality Assurance Process (IQAP) cyclical review cyclical review.

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Graduate Field of Study

Civil and Environmental Engineering

Faculty

Faculty of Engineering

Program/Plan Name

Master of Engineering (MEng) in Civil Engineering - Co-operative Program (direct entry)

Graduate Credential Type

Master's

Accelerated Program

Not applicable

Study Options (New)

Coursework

Program Types

Admit Term(s)

Co-operative

Fall
Winter
Spring**Delivery Mode**

On-campus

Delivery Mode Information**Length of Program**

- Full-time: 4-5 terms (16-20 months)

Registration Option(s)

Full-time

Registration Options Information**Graduate Research Fields**

Proposed

Graduate Specializations

- Architectural Engineering
- Environmental and Water Resources Engineering
- Sustainable Structural Systems
- Transportation Engineering

Existing

Graduate Specializations**Additional Program Information**

- The University of Waterloo does not provide funding for MEng in Civil Engineering students, and the candidates are expected to be self-supporting.

Admissions

Admission Requirements: Minimum Requirements ⓘ

- An Honours Bachelor's degree (or equivalent) with a 75% standing.
- Graduate Record Examination (GRE) score (only for those applicants who completed their degree outside of Canada and the United States).
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 2
- Type of references: academic or professional

Requirements Information

Graduate Degree Requirements

- Students must complete the course and milestone requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).
- The MEng in Civil Engineering - Co-operative Program will enable students to combine graduate studies with work experience.
- The program includes completion of 1-2 required work terms. The work term(s) typically takes place in term 3 (or terms 3 and 4). The work term(s) must meet Co-operative and Experiential Education (CEE) standard work term requirements and Departmental requirements. Students should apply to jobs related to their program of study. Note: the program must start and end on an academic term. Students in the program are encouraged to complete WIL 601 Career Foundations for Work-Integrated Learning in the academic term prior to the first work term.

Coursework Option: Course Requirements

No Rules

Proposed

Coursework Option: Course Requirements

- Students must complete 8 one-term graduate level courses (0.50 unit weight) taken from the 500, 600 and 700 series courses (or courses acceptable for graduate credit).
- At least 4 of the 8 required courses must be taken within the Department of Civil and Environmental Engineering.
- An English for Multilingual Speakers (EMLS) technical/professional writing course for Engineers is required for all students who were not English Language Proficiency (ELP) exempt at the time of admission.
- A maximum of 2 500 level courses may be counted for credit.
- The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure).
- At least half of the courses used for credit must normally be Faculty of Engineering courses.
- Students in the MEng in Civil Engineering program may choose to pursue a maximum of two of the following Graduate Specializations:
 1. Architectural Engineering
 2. Environmental and Water Resources Engineering
 3. Sustainable Structural Systems
 4. Transportation Engineering
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Civil Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for the Graduate Specializations are described below.

1. Graduate Specialization in Architectural Engineering

- To receive the Graduate Specialization in Architectural Engineering, students must successfully complete AE 601 Comprehensive Building Design Studio, at least 2 compulsory courses and 1 elective course. Alternatively, students have the option to complete 4 courses from the compulsory courses list. Note: If students have already successfully completed the compulsory courses, students must complete alternate courses that are approved by the Department Associate Chair, Graduate Studies.
 - Compulsory courses:
 - AE 601 Comprehensive Building Design Studio
 - Choose at least 2 from the following list:
 - ARCH 642 Modernism to the 21st Century
 - CIVE 507 Building Science and Technology
 - CIVE 630 Advanced Building Energy Analysis
 - Elective courses (choose at least 1 from the following list):
 - ARCH 684 Special Topics in Architecture
 - CIVE 505 Structural Dynamics
 - CIVE 512 Rehabilitation of Structures
 - CIVE 596 Construction Engineering
 - CIVE 601 Risk and Reliability
 - CIVE 602 Prestressed Concrete
 - CIVE 603 Reinforced Concrete Mechanics and Design
 - CIVE 604 Advanced Structural Steel Design
 - CIVE 622 Finite Element Analysis

- CIVE 700 Topics in Structural Engineering: Topic 15 Earthquake Engineering
- CIVE 700 Topics in Structural Engineering: Topic 25 Timber Design
- CIVE 700 Topics in Structural Engineering: Topic 27 Design of Structural Concrete Systems
- CIVE 700 Topics in Structural Engineering: Topic 33 Smart Structure Technology
- CIVE 700 Topics in Structural Engineering: Topic 34 Scientific Machine Learning for Engineers
- CIVE 700 Topics in Structural Engineering: Topic 35 Fire and Structures
- CIVE 700 Topics in Structural Engineering: Topic 36 Sustainable Buildings and Environment
- CIVE 700 Topics in Structural Engineering: Topic 39 Circular Engineering and the Built Environment
- CIVE 704 Bridge Design
- CIVE 710 Advanced Project Management
- CIVE 790R Master of Engineering Project
- ME 671 Fundamental Fire Dynamics
- ME 672 Advanced Fire Dynamics
- ME 673 Fire Modeling
- ME 656 Advanced HVAC Systems, Equipment and Energy Efficiency
- SYDE 532 Introduction to Complex Systems

2. Graduate Specialization in Environmental and Water Resources Engineering

- To receive the Graduate Specialization in Environmental and Water Resources Engineering, students must successfully complete at least 2 compulsory courses and 2 elective courses. Alternatively, students have the option to complete 4 courses from the compulsory courses list.
 - Compulsory courses (choose at least 2 from the following list):
 - ENVE 573 Contaminant Transport
 - ENVE 577 Engineering for Solid Waste Management
 - ENVE 585 Air Quality Engineering & Impacts
 - CIVE 671 Aquatic Chemistry
 - CIVE 680 Water Management
 - Elective courses (choose 2 from the following list):
 - CIVE 583/ENVE 583 Design of Urban Water Systems
 - CIVE 670 Physico-Chemical Processes of Water and Wastewater Treatment
 - CIVE 682 Free Surface Hydraulics
 - CIVE 770 Topics in Environmental Engineering: Topic 24 River Restoration
 - CIVE 770 Topics in Environmental Engineering: Topic 41 Atmospheric Emissions to Impacts
 - CIVE 770 Topics in Environmental Engineering: Topic 45 Environmental Fate of Organic Pollutants
 - CIVE 770 Topics in Environmental Engineering: Topic 53 Environmental and Water Resources Simulation Model Calibration
 - CIVE 771 Biological Wastewater Treatment: Theory and Practice
 - CIVE 781 Principles of Hydrologic Modelling
 - CIVE 790R Master of Engineering Project
 - EARTH 691 Special Studies for MSc Students: Topic 159 Geothermal Energy
 - EARTH 691 Special Studies for MSc Students: Topic 161 Energy Geomechanics

3. Graduate Specialization in Sustainable Structural Systems

- To receive the Graduate Specialization in Sustainable Structural Systems, students must successfully complete at least 2 compulsory course and 2 elective courses. Alternatively, students have the option to complete 4 courses from the compulsory courses list.
 - Compulsory courses (choose at least 2 from the following list):
 - CIVE 505 Structural Dynamics
 - CIVE 507 Building Science and Technology
 - CIVE 596 Construction Engineering
 - CIVE 601 Engineering Risk and Reliability
 - CIVE 622 Finite Element Analysis
 - Elective courses (choose 2 from the following list):

- CIVE 512 Rehabilitation of Structures
- CIVE 602 Prestressed Concrete
- CIVE 603 Reinforced Concrete Mechanics and Design
- CIVE 604 Advanced Structural Steel Design
- CIVE 700 Topics in Structural Engineering: Topic 15 Earthquake Engineering
- CIVE 700 Topics in Structural Engineering: Topic 21 Building Energy Analysis
- CIVE 700 Topics in Structural Engineering: Topic 25 Timber Design
- CIVE 700 Topics in Structural Engineering: Topic 27 Design of Structural Concrete Systems
- CIVE 700 Topics in Structural Engineering: Topic 33 Smart Structure Technology
- CIVE 700 Topics in Structural Engineering: Topic 34 Scientific Machine Learning for Engineers
- CIVE 700 Topics in Structural Engineering: Topic 35 Fire and Structures
- CIVE 700 Topics in Structural Engineering: Topic 36 Sustainable Buildings and Environment
- CIVE 700 Topics in Structural Engineering: Topic 39 Circular Engineering and the Built Environment
- CIVE 710 Advanced Project Management
- CIVE 790R Master of Engineering Project

4. Graduate Specialization in Transportation Engineering

- To receive the Graduate Specialization in Transportation Engineering, students must successfully complete at least 2 compulsory courses and 2 elective courses. Alternatively, students have the option to complete 4 courses from the compulsory courses list.
 - Compulsory courses (choose at least 2 from the following list):
 - CIVE 542 Pavement Structural Design
 - CIVE 640 Urban Transportation Planning Models: Principles & Applications
 - CIVE 641 Advances in Public Transportation Planning, Operations & Control
 - CIVE 642 Pavement Design and Management I
 - CIVE 643 Fundamentals of Traffic Flow Theory
 - Elective courses (choose 2 from the following list):
 - CIVE 644 Innovative and Sustainable Infrastructure Materials
 - CIVE 645 Modeling Transportation, Land Use and Spatial Economics
 - CIVE 646 Computer Applications in Transportation Engineering
 - CIVE 742 Pavement Design and Management II

Existing

Coursework Option: Course Requirements

- Students must complete 8 one-term graduate level courses (0.50 unit weight) taken from the 500, 600 and 700 series courses (or courses acceptable for graduate credit).
- At least 4 of the 8 required courses must be taken within the Department of Civil and Environmental Engineering.
- An English for Multilingual Speakers (EMLS) technical/professional writing course for Engineers is required for all students who were not English Language Proficiency (ELP) exempt at the time of admission.
- A maximum of 2 500 level courses may be counted for credit.
- The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure).
- At least half of the courses used for credit must normally be Faculty of Engineering courses.

Coursework Option: Milestone Requirements

Graduate Studies Work Report

- Students must complete one or two work-term experiences. For each work experience, a work report must be submitted to the Department for review to earn credit for the work report.
- Students are responsible for following the roles and responsibilities of Co-operative and Experiential Education (CEE).

Notes ⓘ

- Department of Civil and Environmental Engineering website

Workflow Information

Workflow Path ⓘ

Committee approvals

Faculty/AFIW Path(s) for Workflow ⓘ

Faculty of Engineering

Senate Workflow

Senate Regular

Dependencies

Dependent Courses and Programs/Plans

There are no dependencies

MEng in Electrical & Computer Engineering **Master of Engineering (MEng) in Electrical and Computer Engineering**

Under Review | Spring 2025

Proposal Information

Status

Active

Workflow Status

In Progress

SGRC, Senate Graduate and Research Council (SGRC)

expand ▲

Waiting for Approval | Approval Delegate(s)

Mike Grivicic

Tim Weber-Kraljevski

Diana Goncalves

Melanie Figueiredo

Ashley Day

Changes

- Coursework Option: Course Requirements
- Graduate Specializations
- Effective Term and Year
- Admin Notes

Effective Date and Career

Career

Graduate

Important!

Proposed

Effective Term and Year ⓘ

Spring 2025

Existing

Effective Term and Year ⓘ

Winter 2024

Proposal Details

Proposal Type ⓘ

Change

Academic Unit Approval

04/25/2024

Quality Assurance Designation ⓘ

Major Modification

Major Modification Categories

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

Is there an impact to existing students? ⓘ

Yes

Impact on Existing Students

Students currently registered in the program will be able to obtain the new Graduate Specialization designation at the time of degree completion if they fulfill the applicable degree requirements.

Is the credential name changing?

No

Graduate Co-operative Requirements

Not Applicable

Internship Requirements

Not Applicable

Rationale and Background for Change(s)

Updating the degree requirements to include a new Graduate Specialization in Quantum Engineering: The new graduate specialization will provide an opportunity for our professional master's students to specialize in the emerging area of quantum engineering. Graduate specializations also help direct our professional master's students in their course selections. The field of quantum engineering has had demand at the undergraduate level as well as in our research based programs and this specialization will now allow our professional master's students to pursue this engineering field as well.

Consultations (Departmental)

Supporting Documentation

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Electrical and Computer Engineering

Graduate Field of Study

Electrical and Computer Engineering

Faculty

Faculty of Engineering

Program/Plan Name

Master of Engineering (MEng) in Electrical and Computer Engineering

Graduate Credential Type

Master's

Accelerated Program

Not applicable

Study Options (New)

Coursework

Program Types

Admit Term(s)

Fall
Winter
Spring

Delivery Mode

On-campus

Delivery Mode Information**Length of Program**

- Full-time: 4 terms (16 months)
- Part-time: 8 terms (32 months)

Registration Option(s)

Full-time
Part-time

Registration Options Information**Graduate Research Fields**

Proposed

Graduate Specializations

- Artificial Intelligence and Machine Learning
- Biomedical Engineering
- Business Leadership
- Computer Networking and Security
- Nanoelectronic Circuits and Systems
- Nanoelectronic Devices and Materials
- Quantum Engineering
- Software
- Sustainable Energy

Existing

Graduate Specializations

- Artificial Intelligence and Machine Learning
- Biomedical Engineering
- Business Leadership
- Computer Networking and Security
- Nanoelectronic Circuits and Systems
- Nanoelectronic Devices and Materials
- Software
- Sustainable Energy

Additional Program Information

Admissions

Admission Requirements: Minimum Requirements ⓘ

- The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada.
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 2
- Type of references: at least 1 academic

Requirements Information

Graduate Degree Requirements ⓘ

- Students must complete the course requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).

Coursework Option: Course Requirements

No Rules

Proposed

Coursework Option: Course Requirements

- Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department.
- Students may register for any ECE course at the 600 or 700 levels.
- A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Mathematics and Science. Students opting for the Graduate Specialization in Business Leadership are allowed to take a maximum of 4 courses from outside ECE, but from the specified list of BE/BET courses, detailed below.
- A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. Students who receive a grade of less than 65% may be permitted to take a maximum of 2 additional courses to meet the minimum averages for the degree requirements (outlined above).
- Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses, as the number of minimum required courses may differ.
- Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations:
 1. Artificial Intelligence and Machine Learning
 2. Biomedical Engineering
 3. Business Leadership
 4. Computer Networking and Security
 5. Nanoelectronic Circuits and Systems
 6. Nanoelectronic Devices and Materials
 7. Quantum Engineering
 8. Software
 9. Sustainable Energy
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.
- Note: Not all elective courses for any given Graduate Specialization are guaranteed to be offered each year. Students are encouraged to take elective courses when they are offered and should plan accordingly.
- Students will be able to complete the Business Leadership Graduate Specialization along with 1 other ECE Graduate Specialization, noting the following:
 - Each course will only be counted towards one Graduate Specialization and the MEng degree.
 - The number of required courses for the MEng degree will increase from 8 to 9 or 10 depending on the requirements associated with the Graduate Specializations.
- Students must consult with the ECE Masters Coordinator to finalize their plan of study and to ensure that they are able to meet the degree and Graduate Specialization requirements within the program time limits.

1. Graduate Specialization in Artificial Intelligence and Machine Learning

- To receive the Graduate Specialization in Artificial Intelligence and Machine Learning, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 657 Tools of Intelligent Systems Design

- ECE 657A Data and Knowledge Modelling and Analysis
- Elective courses (choose 3 from the following list):
 - ECE 602 Introduction to Optimization
 - ECE 603 Statistical Signal Processing
 - ECE 606 Algorithm Design and Analysis
 - ECE 607 Fundamentals of Ultrasonics
 - ECE 613 Image Processing and Visual Communication
 - ECE 659 Intelligent Sensors and Sensor Networks
 - ECE 700 Topic-7 Game Theory with Engineering Applications
 - ECE 750 Topic-32 Biology and Computation
 - ECE 750 Topic-33 Embodied Intelligence
 - ECE 750 Topic-35 Social Robotics
 - MSCI 718 Statistical Methods for Data Analytics

2. Graduate Specialization in Biomedical Engineering

- To receive the Graduate Specialization in Biomedical Engineering, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 601 Foundations of Biology in Engineering
 - ECE 608 Quantitative Methods in Biomedical Engineering
 - ECE 609 Engineering Analysis of Living Cells
 - Elective courses (choose 2 from the following list):
 - ECE 607 Fundamentals of Ultrasonics
 - ECE 613 Image Processing and Visual Communications
 - ECE 675 Radiation and Propagation of Electromagnetic Fields
 - ECE 750 Topic-32 Biology and Computation
 - ECE 750 Topic-33 Embodied Intelligence
 - SYDE 677 Medical Imaging

3. Graduate Specialization in Business Leadership

- To receive the Graduate Specialization in Business Leadership, students must successfully complete 2 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - BE 600 Management and Leadership
 - BE 601 Introduction to Financial and Managerial Accounting
 - Elective courses (choose 2 from the following list): Note: not all elective courses may be offered each year.
 - BE 602 Data Analysis and Management
 - BE 603 Operations and Supply Chain Management
 - BE 604 Marketing Management
 - BE 605 Project Management
 - BE 606 Entrepreneurship and Innovation
 - BE 610 Special Topics in Business and Entrepreneurship
 - BE 660 Negotiations
 - BE 680 Consulting
 - ECE 657A Data & Knowledge Modelling & Analysis
 - ECE 699 Master of Engineering Project
 - Note: A maximum of 4 courses from outside the Department of ECE is permitted to satisfy both the MEng in ECE and Graduate Specialization in Business Leadership requirements.

4. Graduate Specialization in Computer Networking and Security

- To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:

- ECE 610 Broadband Communication Networks
- ECE 628 Computer Network Security
- ECE 655 Protocols, Software, and Issues in Mobile Systems
- Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 611 Digital Communications
 - ECE 612 Information Theory
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 659 Intelligent Sensors & Wireless Sensor Network
 - ECE 715 Wireless Communication Networks
 - ECE 716 Communication Security

5. Graduate Specialization in Nanoelectronic Circuits and Systems

- To receive the Graduate Specialization in Nanoelectronic Circuits and Systems, students must successfully complete 2 compulsory project courses, and 5 elective courses:
- Note: Students are required to complete the 5 elective courses prior to enrolling in the ECE 699A project course.
- The Graduate Specialization in Nanoelectronic Circuits and Systems is primarily designed for students starting in the Fall term. Therefore, if a student starts in the Spring or Winter term the Graduate Specialization may not be guaranteed, due to the sequencing of elective courses.
 - Compulsory courses:
 - ECE 699A Master of Engineering Project 1
 - ECE 699B Master of Engineering Project 2
 - Elective courses: Choose 5 total between Set-A and Set-B. A minimum of 2 of the 5 electives must be taken from Set-A.
 - Set-A:
 - ECE 621 Computer Organization
 - ECE 627 Register-transfer-level Digital Systems
 - ECE 630 Physics & Models Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - ECE 636 Advanced Analog Integrated Circuits
 - ECE 637 Digital Integrated Circuits
 - ECE 642 Radio Frequency IC Design
 - ECE 671 Microwave & RF Engineering
 - Set-B:
 - ECE 606 Algorithm Design and Analysis
 - ECE 638 CMOS Sensor Integrated Circuits
 - ECE 730 Topic-9 VLSI Quality, Reliability and Yield Engineering
 - ECE 730 Topic-16 Embedded Semiconductor RAM
 - ECE 730 Topic-30 Advanced VLSI Devices
 - ECE 738 VLSI Circuits for Wireless Communication
 - ECE 740 Topic-3 CMOS Data Converters
 - ECE 770 Topic-22 Radio and Wireless Systems

6. Graduate Specialization in Nanoelectronic Devices and Materials

- To receive the Graduate Specialization in Nanoelectronic Devices and Materials, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 630 Physics and Models of Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - Elective courses (choose 3 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 633 Nanoelectronics

- ECE 634 Organic Electronics
- ECE 635 Fabrication in the Nanoscale: Technology and Applications
- ECE 672 Optoelectronic Devices
- NANO 600 Introduction to Nanotechnology

7. Graduate Specialization in Quantum Engineering

- To receive the Graduate Specialization in Quantum Engineering, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 676 Quantum Information Processing Devices
 - ECE 677 Applied Quantum Mechanics
 - Elective courses (choose 3 from the following list):
 - ECE 630 Physics and Models of Semiconductor Devices
 - ECE 633 Nanoelectronics
 - ECE 671 Microwave and RF Engineering
 - ECE 676B Experimental Quantum Engineering
 - ECE 676C Programming of Quantum Computing Algorithms
 - ECE 676D Superconducting Quantum Circuits
 - ECE 676E Lab on Low-Temperature Quantum Engineering
 - QIC 710 Quantum Information Processing
 - QIC 880 Nanoelectronics for Quantum Information Processing

8. Graduate Specialization in Software

- To receive the Graduate Specialization in Software, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 650 Methods and Tools for Software Engineering
 - ECE 651 Foundations of Software Engineering
 - ECE 653 Software Testing, Quality Assurance and Maintenance
 - Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 655 Protocols, Software, Issues in Mobile Systems
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 658 Component Based Software

9. Graduate Specialization in Sustainable Energy

- To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 1 compulsory course and 4 elective courses:
 - Compulsory course:
 - ECE 660 Operation and Control of Future Integrated Energy Systems
 - Elective courses (choose 4 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 662 Power System Analysis and Control
 - ECE 663 Energy Processing
 - ECE 665 High Voltage Engineering Applications
 - ECE 666 Power Systems Operation
 - ECE 668 Distribution System Engineering
 - ECE 669 Dielectric Materials
 - ECE 761 HVDC and FACTS
 - ECE 762 Power System Components and Modelling
 - ECE 763 Sustainable Distributed Power Generation
 - ECE 765 Power System Protection and Relaying

- ECE 768 Power System Quality

Existing

Coursework Option: Course Requirements

- Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department.
- Students may register for any ECE course at the 600 or 700 levels.
- A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Mathematics and Science. Students opting for the Graduate Specialization in Business Leadership are allowed to take a maximum of 4 courses from outside ECE, but from the specified list of BE/BET courses, detailed below.
- A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. Students who receive a grade of less than 65% may be permitted to take a maximum of 2 additional courses to meet the minimum averages for the degree requirements (outlined above).
- Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses, as the number of minimum required courses may differ.
- Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations:
 1. Artificial Intelligence and Machine Learning
 2. Biomedical Engineering
 3. Business Leadership
 4. Computer Networking and Security
 5. Nanoelectronic Circuits and Systems
 6. Nanoelectronic Devices and Materials
 7. Software
 8. Sustainable Energy
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.
- Note: Not all elective courses for any given Graduate Specialization are guaranteed to be offered each year. Students are encouraged to take elective courses when they are offered and should plan accordingly.
- Students will be able to complete the Business Leadership Graduate Specialization along with 1 other ECE Graduate Specialization, noting the following:
 - Each course will only be counted towards one Graduate Specialization and the MEng degree.
 - The number of required courses for the MEng degree will increase from 8 to 9 or 10 depending on the requirements associated with the Graduate Specializations.
- Students must consult with the ECE Masters Coordinator to finalize their plan of study and to ensure that they are able to meet the degree and Graduate Specialization requirements within the program time limits.

1. Graduate Specialization in Artificial Intelligence and Machine Learning

- To receive the Graduate Specialization in Artificial Intelligence and Machine Learning, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 657A Data and Knowledge Modelling and Analysis
 - Elective courses (choose 3 from the following list):
 - ECE 602 Introduction to Optimization

- ECE 603 Statistical Signal Processing
- ECE 606 Algorithm Design and Analysis
- ECE 607 Fundamentals of Ultrasonics
- ECE 613 Image Processing and Visual Communication
- ECE 659 Intelligent Sensors and Sensor Networks
- ECE 700 Topic-7 Game Theory with Engineering Applications
- ECE 750 Topic-32 Biology and Computation
- ECE 750 Topic-33 Embodied Intelligence
- ECE 750 Topic-35 Social Robotics
- MSCI 718 Statistical Methods for Data Analytics

2. Graduate Specialization in Biomedical Engineering

- To receive the Graduate Specialization in Biomedical Engineering, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 601 Foundations of Biology in Engineering
 - ECE 608 Quantitative Methods in Biomedical Engineering
 - ECE 609 Engineering Analysis of Living Cells
 - Elective courses (choose 2 from the following list):
 - ECE 607 Fundamentals of Ultrasonics
 - ECE 613 Image Processing and Visual Communications
 - ECE 675 Radiation and Propagation of Electromagnetic Fields
 - ECE 750 Topic-32 Biology and Computation
 - ECE 750 Topic-33 Embodied Intelligence
 - SYDE 677 Medical Imaging

3. Graduate Specialization in Business Leadership

- To receive the Graduate Specialization in Business Leadership, students must successfully complete 2 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - BE 600 Management and Leadership
 - BE 601 Introduction to Financial and Managerial Accounting
 - Elective courses (choose 2 from the following list): Note: not all elective courses may be offered each year.
 - BE 602 Data Analysis and Management
 - BE 603 Operations and Supply Chain Management
 - BE 604 Marketing Management
 - BE 605 Project Management
 - BE 606 Entrepreneurship and Innovation
 - BE 610 Special Topics in Business and Entrepreneurship
 - BE 660 Negotiations
 - BE 680 Consulting
 - ECE 657A Data & Knowledge Modelling & Analysis
 - ECE 699 Master of Engineering Project
 - Note: A maximum of 4 courses from outside the Department of ECE is permitted to satisfy both the MEng in ECE and Graduate Specialization in Business Leadership requirements.

4. Graduate Specialization in Computer Networking and Security

- To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 610 Broadband Communication Networks
 - ECE 628 Computer Network Security
 - ECE 655 Protocols, Software, and Issues in Mobile Systems

- o Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 611 Digital Communications
 - ECE 612 Information Theory
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 659 Intelligent Sensors & Wireless Sensor Network
 - ECE 715 Wireless Communication Networks
 - ECE 716 Communication Security

5. Graduate Specialization in Nanoelectronic Circuits and Systems

- To receive the Graduate Specialization in Nanoelectronic Circuits and Systems, students must successfully complete 2 compulsory project courses, and 5 elective courses:
- Note: Students are required to complete the 5 elective courses prior to enrolling in the ECE 699A project course.
- The Graduate Specialization in Nanoelectronic Circuits and Systems is primarily designed for students starting in the Fall term. Therefore, if a student starts in the Spring or Winter term the Graduate Specialization may not be guaranteed, due to the sequencing of elective courses.
 - o Compulsory courses:
 - ECE 699A Master of Engineering Project 1
 - ECE 699B Master of Engineering Project 2
 - o Elective courses: Choose 5 total between Set-A and Set-B. A minimum of 2 of the 5 electives must be taken from Set-A.
 - Set-A:
 - ECE 621 Computer Organization
 - ECE 627 Register-transfer-level Digital Systems
 - ECE 630 Physics & Models Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - ECE 636 Advanced Analog Integrated Circuits
 - ECE 637 Digital Integrated Circuits
 - ECE 642 Radio Frequency IC Design
 - ECE 671 Microwave & RF Engineering
 - Set-B:
 - ECE 606 Algorithm Design and Analysis
 - ECE 638 CMOS Sensor Integrated Circuits
 - ECE 730 Topic-9 VLSI Quality, Reliability and Yield Engineering
 - ECE 730 Topic-16 Embedded Semiconductor RAM
 - ECE 730 Topic-30 Advanced VLSI Devices
 - ECE 738 VLSI Circuits for Wireless Communication
 - ECE 740 Topic-3 CMOS Data Converters
 - ECE 770 Topic-22 Radio and Wireless Systems

6. Graduate Specialization in Nanoelectronic Devices and Materials

- To receive the Graduate Specialization in Nanoelectronic Devices and Materials, students must successfully complete 2 compulsory courses and 3 elective courses:
 - o Compulsory courses:
 - ECE 630 Physics and Models of Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - o Elective courses (choose 3 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 633 Nanoelectronics
 - ECE 634 Organic Electronics
 - ECE 635 Fabrication in the Nanoscale: Technology and Applications
 - ECE 672 Optoelectronic Devices

- NANO 600 Introduction to Nanotechnology

7. Graduate Specialization in Software

- To receive the Graduate Specialization in Software, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 650 Methods and Tools for Software Engineering
 - ECE 651 Foundations of Software Engineering
 - ECE 653 Software Testing, Quality Assurance and Maintenance
 - Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 655 Protocols, Software, Issues in Mobile Systems
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 658 Component Based Software

8. Graduate Specialization in Sustainable Energy

- To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 1 compulsory course and 4 elective courses:
 - Compulsory course:
 - ECE 660 Operation and Control of Future Integrated Energy Systems
 - Elective courses (choose 4 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 662 Power System Analysis and Control
 - ECE 663 Energy Processing
 - ECE 665 High Voltage Engineering Applications
 - ECE 666 Power Systems Operation
 - ECE 668 Distribution System Engineering
 - ECE 669 Dielectric Materials
 - ECE 761 HVDC and FACTS
 - ECE 762 Power System Components and Modelling
 - ECE 763 Sustainable Distributed Power Generation
 - ECE 765 Power System Protection and Relaying
 - ECE 768 Power System Quality

Coursework Option: Milestone Requirements

Notes

- Department of Electrical and Computer Engineering website
- Master of Engineering (MEng) in Electrical and Computer Engineering future students program page

Workflow Information

Workflow Path

Committee approvals

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Senate Workflow

Senate Regular

Dependencies

Dependent Courses and Programs/Plans

PREREQUISITES

▼ BE 605 - Project Management	View Courses >
▼ BE 603 - Operations and Supply Chain Management	View Courses >
▼ BE 602 - Data Analysis and Management	View Courses >
▼ BE 606 - Entrepreneurship and Innovation	View Courses >
▼ BE 601 - Introduction to Financial and Managerial Accounting	View Courses >
▼ BE 604 - Marketing Management	View Courses >
▼ BE 600 - Management and Leadership	View Courses >
▼ BE 610 - Special Topics in Business and Entrepreneurship	View Courses >

MEng in Electrical & Computer Engineering-Co-op Master of Engineering (MEng) in Electrical and Computer Engineering - Co-operative Program (direct entry)

Under Review | Spring 2025

Proposal Information

Status

Active

Workflow Status

In Progress

SGRC, Senate Graduate and Research Council (SGRC)

expand ▲

Waiting for Approval | Approval Delegate(s)

- Mike Grivicic
- Tim Weber-Kraljevski
- Diana Goncalves
- Melanie Figueiredo
- Ashley Day

Changes

- Coursework Option: Course Requirements
- Graduate Specializations
- participants
- Effective Term and Year
- Admin Notes

Effective Date and Career

Career

Graduate

Important!

Proposed

Effective Term and Year ⓘ

Spring 2025

Existing

Effective Term and Year ⓘ

Winter 2024

Proposal Details

Proposal Type ⓘ

Change

Academic Unit Approval

04/25/2024

Quality Assurance Designation ⓘ

Major Modification

Major Modification Categories

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

Is there an impact to existing students? ⓘ

Yes

Impact on Existing Students ⓘ

Students currently registered in the program will be able to obtain the new Graduate Specialization designation at the time of degree completion if they fulfill the applicable degree requirements.

Is the credential name changing?

No

Graduate Co-operative Requirements

Not Applicable

Internship Requirements

Not Applicable

Rationale and Background for Change(s) ⓘ

Updating the degree requirements to include a new Graduate Specialization in Quantum Engineering: The new graduate specialization will provide an opportunity for our professional master's students to specialize in the emerging area of quantum engineering. Graduate specializations also help direct our professional master's students in their course selections. The field of quantum engineering has had demand at the undergraduate level as well as in our research based programs and this specialization will now allow our professional master's students to pursue this engineering field as well.

Consultations (Departmental) ⓘ**Supporting Documentation**

General Program/Plan Information

Faculty ⓘ

Faculty of Engineering

Academic Unit ⓘ

Department of Electrical and Computer Engineering

Graduate Field of Study

Electrical and Computer Engineering

Faculty ⓘ

Faculty of Engineering

Program/Plan Name ⓘ

Master of Engineering (MEng) in Electrical and Computer Engineering - Co-operative Program (direct entry)

Graduate Credential Type

Master's

Accelerated Program

Not applicable

Study Options (New)

Coursework

Program Types

Co-operative

Admit Term(s)Fall
Winter
Spring**Delivery Mode**

On-campus

Delivery Mode Information**Length of Program**

- Full-time: 5-6 terms (20-24 months)

Registration Option(s)

Full-time

Registration Options Information**Graduate Research Fields**

Proposed

Graduate Specializations

- Artificial Intelligence and Machine Learning
- Biomedical Engineering
- Business Leadership
- Computer Networking and Security
- Nanoelectronic Circuits and Systems
- Nanoelectronic Devices and Materials
- Quantum Engineering
- Software
- Sustainable Energy

Existing

Graduate Specializations

- Artificial Intelligence and Machine Learning
- Biomedical Engineering
- Business Leadership
- Computer Networking and Security
- Nanoelectronic Circuits and Systems
- Nanoelectronic Devices and Materials
- Software
- Sustainable Energy

Additional Program Information

Admissions

Admission Requirements: Minimum Requirements ⓘ

- The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada.
- English language proficiency (ELP) (if applicable)

Admission Requirements: Application materials

- Résumé
- Supplementary information form
- Transcript(s)

Admission Requirements: References

- Number of references: 2
- Type of references: at least 1 academic

Requirements Information

Graduate Degree Requirements ⓘ

- Students must complete the course and milestone requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).
- The MEng in Electrical and Computer Engineering - Co-operative Program will enable students to combine graduate studies with work experience. The program will foster professional development, networking and new collaborations while enhancing employment opportunities after degree completion.
- The program will include 1 or 2 work terms. The timing of work and academic terms is fairly flexible, but the program must start and end on an academic term. Students in the program are encouraged to complete WIL 601 Career Foundations for Work-Integrated Learning in the academic term prior to the first work term.

Coursework Option: Course Requirements

No Rules

Proposed

Coursework Option: Course Requirements

- Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department.
- Students may register for any ECE course at the 600 or 700 levels.
- A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Mathematics and Science. Students opting for the Graduate Specialization in Business Leadership are allowed to take a maximum of 4 courses from outside ECE, but from the specified list of BE/BET courses, detailed below.
- A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. Students who receive a grade of less than 65% may be permitted to take a maximum of 2 additional courses to meet the minimum averages for the degree requirements (outlined above).
- Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses, as the number of minimum required courses may differ.
- Students in the MEng in Electrical and Computer Engineering - Co-operative Program may choose to pursue one of the following Graduate Specializations:
 1. Artificial Intelligence and Machine Learning
 2. Biomedical Engineering
 3. Business Leadership
 4. Computer Networking and Security
 5. Nanoelectronic Circuits and Systems
 6. Nanoelectronic Devices and Materials
 7. Quantum Engineering
 8. Software
 9. Sustainable Energy
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.
- Note: Not all elective courses for any given Graduate Specialization are guaranteed to be offered each year. Students are encouraged to take elective courses when they are offered and should plan accordingly.
- Students will be able to complete the Business Leadership Graduate Specialization along with 1 other ECE Graduate Specialization, noting the following:
 - Each course will only be counted towards one Graduate Specialization and the MEng degree.
 - The number of required courses for the MEng degree will increase from 8 to 9 or 10 depending on the requirements associated with the Graduate Specializations.
- Students must consult with the ECE Masters Coordinator to finalize their plan of study and to ensure that they are able to meet the degree and Graduate Specialization requirements within the program time limits.

1. Graduate Specialization in Artificial Intelligence and Machine Learning

- To receive the Graduate Specialization in Artificial Intelligence and Machine Learning, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 657 Tools of Intelligent Systems Design

- ECE 657A Data and Knowledge Modelling and Analysis
- Elective courses (choose 3 from the following list):
 - ECE 602 Introduction to Optimization
 - ECE 603 Statistical Signal Processing
 - ECE 606 Algorithm Design and Analysis
 - ECE 607 Fundamentals of Ultrasonics
 - ECE 613 Image Processing and Visual Communication
 - ECE 659 Intelligent Sensors and Sensor Networks
 - ECE 700 Topic-7 Game Theory with Engineering Applications
 - ECE 750 Topic-32 Biology and Computation
 - ECE 750 Topic-33 Embodied Intelligence
 - ECE 750 Topic-35 Social Robotics
 - MSCI 718 Statistical Methods for Data Analytics

2. Graduate Specialization in Biomedical Engineering

- To receive the Graduate Specialization in Biomedical Engineering, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 601 Foundations of Biology in Engineering
 - ECE 608 Quantitative Methods in Biomedical Engineering
 - ECE 609 Engineering Analysis of Living Cells
 - Elective courses (choose 2 from the following list):
 - ECE 607 Fundamentals of Ultrasonics
 - ECE 613 Image Processing and Visual Communications
 - ECE 675 Radiation and Propagation of Electromagnetic Fields
 - ECE 750 Topic-32 Biology and Computation
 - ECE 750 Topic-33 Embodied Intelligence
 - SYDE 677 Medical Imaging

3. Graduate Specialization in Business Leadership

- To receive the Graduate Specialization in Business Leadership, students must successfully complete 2 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - BE 600 Management and Leadership
 - BE 601 Introduction to Financial and Managerial Accounting
 - Elective courses (choose 2 from the following list): Note: not all elective courses may be offered each year.
 - BE 602 Data Analysis and Management
 - BE 603 Operations and Supply Chain Management
 - BE 604 Marketing Management
 - BE 605 Project Management
 - BE 606 Entrepreneurship and Innovation
 - BE 610 Special Topics in Business and Entrepreneurship
 - BE 660 Negotiations
 - BE 680 Consulting
 - ECE 657A Data & Knowledge Modelling & Analysis
 - ECE 699 Master of Engineering Project
 - Note: A maximum of 4 courses from outside the Department of ECE is permitted to satisfy both the MEng in ECE and Graduate Specialization in Business Leadership requirements.

4. Graduate Specialization in Computer Networking and Security

- To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:

- ECE 610 Broadband Communication Networks
- ECE 628 Computer Network Security
- ECE 655 Protocols, Software, and Issues in Mobile Systems
- Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 611 Digital Communications
 - ECE 612 Information Theory
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 659 Intelligent Sensors & Wireless Sensor Network
 - ECE 715 Wireless Communication Networks
 - ECE 716 Communication Security

5. Graduate Specialization in Nanoelectronic Circuits and Systems

- To receive the Graduate Specialization in Nanoelectronic Circuits and Systems, students must successfully complete 2 compulsory project courses, and 5 elective courses:
- Note: Students are required to complete the 5 elective courses prior to enrolling in the ECE 699A project course.
- The Graduate Specialization in Nanoelectronic Circuits and Systems is primarily designed for students starting in the Fall term. Therefore, if a student starts in the Spring or Winter term the Graduate Specialization may not be guaranteed, due to the sequencing of elective courses.
 - Compulsory courses:
 - ECE 699A Master of Engineering Project 1
 - ECE 699B Master of Engineering Project 2
 - Elective courses: Choose 5 total between Set-A and Set-B. A minimum of 2 of the 5 electives must be taken from Set-A.
 - Set-A:
 - ECE 621 Computer Organization
 - ECE 627 Register-transfer-level Digital Systems
 - ECE 630 Physics & Models Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - ECE 636 Advanced Analog Integrated Circuits
 - ECE 637 Digital Integrated Circuits
 - ECE 642 Radio Frequency IC Design
 - ECE 671 Microwave & RF Engineering
 - Set-B:
 - ECE 606 Algorithm Design and Analysis
 - ECE 638 CMOS Sensor Integrated Circuits
 - ECE 730 Topic-9 VLSI Quality, Reliability and Yield Engineering
 - ECE 730 Topic-16 Embedded Semiconductor RAM
 - ECE 730 Topic-30 Advanced VLSI Devices
 - ECE 738 VLSI Circuits for Wireless Communication
 - ECE 740 Topic-3 CMOS Data Converters
 - ECE 770 Topic-22 Radio and Wireless Systems

6. Graduate Specialization in Nanoelectronic Devices and Materials

- To receive the Graduate Specialization in Nanoelectronic Devices and Materials, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 630 Physics and Models of Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - Elective courses (choose 3 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 633 Nanoelectronics

- ECE 634 Organic Electronics
- ECE 635 Fabrication in the Nanoscale: Technology and Applications
- ECE 672 Optoelectronic Devices
- NANO 600 Introduction to Nanotechnology

7. Graduate Specialization in Quantum Engineering

- To receive the Graduate Specialization in Quantum Engineering, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 676 Quantum Information Processing Devices
 - ECE 677 Applied Quantum Mechanics
 - Elective courses (choose 3 from the following list):
 - ECE 630 Physics and Models of Semiconductor Devices
 - ECE 633 Nanoelectronics
 - ECE 671 Microwave and RF Engineering
 - ECE 676B Experimental Quantum Engineering
 - ECE 676C Programming of Quantum Computing Algorithms
 - ECE 676D Superconducting Quantum Circuits
 - ECE 676E Lab on Low-Temperature Quantum Engineering
 - QIC 710 Quantum Information Processing
 - QIC 880 Nanoelectronics for Quantum Information Processing

8. Graduate Specialization in Software

- To receive the Graduate Specialization in Software, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 650 Methods and Tools for Software Engineering
 - ECE 651 Foundations of Software Engineering
 - ECE 653 Software Testing, Quality Assurance and Maintenance
 - Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 655 Protocols, Software, Issues in Mobile Systems
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 658 Component Based Software

9. Graduate Specialization in Sustainable Energy

- To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 1 compulsory course and 4 elective courses:
 - Compulsory course:
 - ECE 660 Operation and Control of Future Integrated Energy Systems
 - Elective courses (choose 4 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 662 Power System Analysis and Control
 - ECE 663 Energy Processing
 - ECE 665 High Voltage Engineering Applications
 - ECE 666 Power Systems Operation
 - ECE 668 Distribution System Engineering
 - ECE 669 Dielectric Materials
 - ECE 761 HVDC and FACTS
 - ECE 762 Power System Components and Modelling
 - ECE 763 Sustainable Distributed Power Generation
 - ECE 765 Power System Protection and Relaying

- ECE 768 Power System Quality

Existing

Coursework Option: Course Requirements

- Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department.
- Students may register for any ECE course at the 600 or 700 levels.
- A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Mathematics and Science. Students opting for the Graduate Specialization in Business Leadership are allowed to take a maximum of 4 courses from outside ECE, but from the specified list of BE/BET courses, detailed below.
- A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. Students who receive a grade of less than 65% may be permitted to take a maximum of 2 additional courses to meet the minimum averages for the degree requirements (outlined above).
- Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses, as the number of minimum required courses may differ.
- Students in the MEng in Electrical and Computer Engineering - Co-operative Program may choose to pursue one of the following Graduate Specializations:
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 2. Biomedical Engineering
 3. Business Leadership
 4. Computer Networking and Security
 5. Nanoelectronic Circuits and Systems
 6. Nanoelectronic Devices and Materials
 7. Software
 8. Sustainable Energy
- A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.
- All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.
- Note: Not all elective courses for any given Graduate Specialization are guaranteed to be offered each year. Students are encouraged to take elective courses when they are offered and should plan accordingly.
- Students will be able to complete the Business Leadership Graduate Specialization along with 1 other ECE Graduate Specialization, noting the following:
 - Each course will only be counted towards one Graduate Specialization and the MEng degree.
 - The number of required courses for the MEng degree will increase from 8 to 9 or 10 depending on the requirements associated with the Graduate Specializations.
- Students must consult with the ECE Masters Coordinator to finalize their plan of study and to ensure that they are able to meet the degree and Graduate Specialization requirements within the program time limits.

1. Graduate Specialization in Artificial Intelligence and Machine Learning

- To receive the Graduate Specialization in Artificial Intelligence and Machine Learning, students must successfully complete 2 compulsory courses and 3 elective courses:
 - Compulsory courses:
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 657A Data and Knowledge Modelling and Analysis
 - Elective courses (choose 3 from the following list):
 - ECE 602 Introduction to Optimization

- ECE 603 Statistical Signal Processing
- ECE 606 Algorithm Design and Analysis
- ECE 607 Fundamentals of Ultrasonics
- ECE 613 Image Processing and Visual Communication
- ECE 659 Intelligent Sensors and Sensor Networks
- ECE 700 Topic-7 Game Theory with Engineering Applications
- ECE 750 Topic-32 Biology and Computation
- ECE 750 Topic-33 Embodied Intelligence
- ECE 750 Topic-35 Social Robotics
- MSCI 718 Statistical Methods for Data Analytics

2. Graduate Specialization in Biomedical Engineering

- To receive the Graduate Specialization in Biomedical Engineering, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 601 Foundations of Biology in Engineering
 - ECE 608 Quantitative Methods in Biomedical Engineering
 - ECE 609 Engineering Analysis of Living Cells
 - Elective courses (choose 2 from the following list):
 - ECE 607 Fundamentals of Ultrasonics
 - ECE 613 Image Processing and Visual Communications
 - ECE 675 Radiation and Propagation of Electromagnetic Fields
 - ECE 750 Topic-32 Biology and Computation
 - ECE 750 Topic-33 Embodied Intelligence
 - SYDE 677 Medical Imaging

3. Graduate Specialization in Business Leadership

- To receive the Graduate Specialization in Business Leadership, students must successfully complete 2 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - BE 600 Management and Leadership
 - BE 601 Introduction to Financial and Managerial Accounting
 - Elective courses (choose 2 from the following list): Note: not all elective courses may be offered each year.
 - BE 602 Data Analysis and Management
 - BE 603 Operations and Supply Chain Management
 - BE 604 Marketing Management
 - BE 605 Project Management
 - BE 606 Entrepreneurship and Innovation
 - BE 610 Special Topics in Business and Entrepreneurship
 - BE 660 Negotiations
 - BE 680 Consulting
 - ECE 657A Data & Knowledge Modelling & Analysis
 - ECE 699 Master of Engineering Project
 - Note: A maximum of 4 courses from outside the Department of ECE is permitted to satisfy both the MEng in ECE and Graduate Specialization in Business Leadership requirements.

4. Graduate Specialization in Computer Networking and Security

- To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 610 Broadband Communication Networks
 - ECE 628 Computer Network Security
 - ECE 655 Protocols, Software, and Issues in Mobile Systems

- o Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 611 Digital Communications
 - ECE 612 Information Theory
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 659 Intelligent Sensors & Wireless Sensor Network
 - ECE 715 Wireless Communication Networks
 - ECE 716 Communication Security

5. Graduate Specialization in Nanoelectronic Circuits and Systems

- To receive the Graduate Specialization in Nanoelectronic Circuits and Systems, students must successfully complete 2 compulsory project courses, and 5 elective courses:
- Note: Students are required to complete the 5 elective courses prior to enrolling in the ECE 699A project course.
- The Graduate Specialization in Nanoelectronic Circuits and Systems is primarily designed for students starting in the Fall term. Therefore, if a student starts in the Spring or Winter term the Graduate Specialization may not be guaranteed, due to the sequencing of elective courses.
 - o Compulsory courses:
 - ECE 699A Master of Engineering Project 1
 - ECE 699B Master of Engineering Project 2
 - o Elective courses: Choose 5 total between Set-A and Set-B. A minimum of 2 of the 5 electives must be taken from Set-A.
 - Set-A:
 - ECE 621 Computer Organization
 - ECE 627 Register-transfer-level Digital Systems
 - ECE 630 Physics & Models Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - ECE 636 Advanced Analog Integrated Circuits
 - ECE 637 Digital Integrated Circuits
 - ECE 642 Radio Frequency IC Design
 - ECE 671 Microwave & RF Engineering
 - Set-B:
 - ECE 606 Algorithm Design and Analysis
 - ECE 638 CMOS Sensor Integrated Circuits
 - ECE 730 Topic-9 VLSI Quality, Reliability and Yield Engineering
 - ECE 730 Topic-16 Embedded Semiconductor RAM
 - ECE 730 Topic-30 Advanced VLSI Devices
 - ECE 738 VLSI Circuits for Wireless Communication
 - ECE 740 Topic-3 CMOS Data Converters
 - ECE 770 Topic-22 Radio and Wireless Systems

6. Graduate Specialization in Nanoelectronic Devices and Materials

- To receive the Graduate Specialization in Nanoelectronic Devices and Materials, students must successfully complete 2 compulsory courses and 3 elective courses:
 - o Compulsory courses:
 - ECE 630 Physics and Models of Semiconductor Devices
 - ECE 631 Microelectronic Processing Technology
 - o Elective courses (choose 3 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 633 Nanoelectronics
 - ECE 634 Organic Electronics
 - ECE 635 Fabrication in the Nanoscale: Technology and Applications
 - ECE 672 Optoelectronic Devices

- NANO 600 Introduction to Nanotechnology

7. Graduate Specialization in Software

- To receive the Graduate Specialization in Software, students must successfully complete 3 compulsory courses and 2 elective courses:
 - Compulsory courses:
 - ECE 650 Methods and Tools for Software Engineering
 - ECE 651 Foundations of Software Engineering
 - ECE 653 Software Testing, Quality Assurance and Maintenance
 - Elective courses (choose 2 from the following list):
 - ECE 606 Algorithm Design and Analysis
 - ECE 655 Protocols, Software, Issues in Mobile Systems
 - ECE 656 Database Systems
 - ECE 657 Tools of Intelligent Systems Design
 - ECE 658 Component Based Software

8. Graduate Specialization in Sustainable Energy

- To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 1 compulsory course and 4 elective courses:
 - Compulsory course:
 - ECE 660 Operation and Control of Future Integrated Energy Systems
 - Elective courses (choose 4 from the following list):
 - ECE 632 Photovoltaic Energy Conversion
 - ECE 662 Power System Analysis and Control
 - ECE 663 Energy Processing
 - ECE 665 High Voltage Engineering Applications
 - ECE 666 Power Systems Operation
 - ECE 668 Distribution System Engineering
 - ECE 669 Dielectric Materials
 - ECE 761 HVDC and FACTS
 - ECE 762 Power System Components and Modelling
 - ECE 763 Sustainable Distributed Power Generation
 - ECE 765 Power System Protection and Relaying
 - ECE 768 Power System Quality

Coursework Option: Milestone Requirements

Graduate Studies Work Report

- Students must complete one or two work-term placements. A work report must be submitted to the Department for review and credit by the end of each work term.
- Students are responsible for following the regulations and procedures of Co-operative and Experiential Education (CEE).

Notes

- Department of Electrical and Computer Engineering website
- Master of Engineering (MEng) in Electrical and Computer Engineering - Co-operative Program future students program page

Workflow Information

Workflow Path ⓘ

Committee approvals

Faculty/AFIW Path(s) for Workflow ⓘ

Faculty of Engineering

Senate Workflow

Senate Regular

Dependencies

Dependent Courses and Programs/Plans

PREREQUISITES

✓ BE 605 - Project Management	View Courses >
✓ BE 603 - Operations and Supply Chain Management	View Courses >
✓ BE 602 - Data Analysis and Management	View Courses >
✓ BE 606 - Entrepreneurship and Innovation	View Courses >
✓ BE 601 - Introduction to Financial and Managerial Accounting	View Courses >
✓ BE 604 - Marketing Management	View Courses >
✓ BE 600 - Management and Leadership	View Courses >
✓ BE 610 - Special Topics in Business and Entrepreneurship	View Courses >

Prior to form submission, review the [content revision instructions](#) and information regarding [major/minor modifications](#). For questions about the form submission, contact [Trevor Clews](#), Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Engineering

Programs: 1) Master of Engineering (MEng) in Mechanical and Mechatronics Engineering
 2) Master of Engineering (MEng) in Mechanical and Mechatronics Engineering - Co-operative Program

Program contact name(s): Cecile Devaud

Form completed by: Cecile Devaud

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the [SGRC Graduate Studies Course/Milestone Form](#).

Updating the MEng degree requirements to include three new Graduate Specializations. Changing the name of the current "Green Energy" Graduate Specialization to "Sustainable Energy" and updating the list of required/elective courses associated with the specialization.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

The proposed changes are prompted by the 2023 Mechanical and Mechatronics Engineering (MME) Institutional Quality Assurance Process (IQAP) cyclical review that includes the external reviewers' assessment and department-wide-consultation of faculty members and graduate students through surveys and discussions. These changes follow the recommendations of the external reviewers of the 2023 MME IQAP cyclical review. Their recommendation was to "deviate from the current a la carte approach of students sorting out their academic journey, develop a framework that allows flexibility, but also points to the opportunities in an organized and strategic fashion". The new specializations will improve clarity of the graduate courses offered in the Department with associated themes. The specializations will provide a guided path for MEng students, while keeping some flexibility in the course selection. The updates to the existing Green Energy specialization are needed since the list of courses is outdated and the current title does not reflect the course offering that is focused on a broader content on sustainable energy. The MME MEng program learning outcomes have not changed.

Proposed effective date: Term: Spring Year: 2025

Current [Graduate Studies Academic Calendar \(GSAC\)](#) page (include the link to the web page where the changes are to be made):

<https://uwaterloo.ca/academic-calendar/graduate-studies/catalog#/programs/rkNj110Rjn>

<https://uwaterloo.ca/academic-calendar/graduate-studies/catalog#/programs/r1V0l1ARi2>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Graduate specializations</p> <ul style="list-style-type: none"> • Green Energy <p>Degree requirements</p> <ul style="list-style-type: none"> • Students must complete the course requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM). <p>Course requirements</p> <ul style="list-style-type: none"> • Students must complete 8 one-term (0.50 unit weight) graduate level courses (or courses acceptable for graduate credit). • A maximum of 2 500-level courses may be counted for credit. • An English for Multilingual Speakers (EMLS) technical/professional course is normally required for all students who were not English Language Proficiency (ELP) exempt at the time of admission. This course is normally taken in the first term of the program. • The EMLS communication course can be waived at the discretion of the Department. • At least 2 out of the 8 required courses must be taken from the following list of ME graduate core courses: <ul style="list-style-type: none"> ○ ME 620 Mechanics of Continua ○ ME 621 Advanced Finite Element Method ○ ME 631 Mechanical Metallurgy ○ ME 632 Experimental Methods in Materials Engineering ○ ME 640 Autonomous Mobile Robotics ○ ME 649 Control of Machines and Processes ○ ME 651 Heat Conduction ○ ME 652 Convective Heat Transfer ○ ME 653 Radiation Heat Transfer ○ ME 662 Advanced Fluid Mechanics ○ ME 664 Turbulent Flow • MEng students completing the Graduate Diploma (GDip) program option or the Graduate Specialization are allowed to use the mandatory courses from the GDip or Graduate Specialization to count toward 2 of the 8 core courses. • MEng students must attend at least 4 MME research seminars. • Additional Faculty regulations concerning Master's degree requirements are: 	<p>Graduate specializations</p> <ul style="list-style-type: none"> • <u>Building Systems</u> • <u>Materials and Advanced Manufacturing</u> • <u>Mechatronic Systems</u> • <u>Sustainable Energy</u> <p>Degree requirements</p> <ul style="list-style-type: none"> • Students must complete the course requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM). <p>Course requirements</p> <ul style="list-style-type: none"> • Students must complete 8 one-term (0.50 unit weight) graduate level courses (or courses acceptable for graduate credit). • A maximum of 2 500-level courses may be counted for credit. • An English for Multilingual Speakers (EMLS) technical/professional course is normally required for all students who were not English Language Proficiency (ELP) exempt at the time of admission. This course is normally taken in the first term of the program. • The EMLS communication course can be waived at the discretion of the Department. • At least 2 out of the 8 required courses must be taken from the following list of ME graduate core courses: <ul style="list-style-type: none"> ○ ME 620 Mechanics of Continua ○ ME 621 Advanced Finite Element Method ○ ME 631 Mechanical Metallurgy ○ ME 632 Experimental Methods in Materials Engineering ○ ME 640 Autonomous Mobile Robotics ○ ME 649 Control of Machines and Processes ○ ME 651 Heat Conduction ○ ME 652 Convective Heat Transfer ○ ME 653 Radiation Heat Transfer ○ ME 662 Advanced Fluid Mechanics ○ ME 664 Turbulent Flow • MEng students must attend at least 4 MME research seminars. • Additional Faculty regulations concerning Master's degree requirements are: <ul style="list-style-type: none"> ○ The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> ○ The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure). ○ At least half of the courses used for credit must normally be Faculty of Engineering courses and the other half need to be Mechanical and Mechatronics Engineering courses. • Students in the MEng in Mechanical and Mechatronics Engineering program may choose to pursue the following Graduate Specialization: <ul style="list-style-type: none"> 1. Green Energy • A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. • All MEng Graduate Specializations in Mechanical and Mechatronics Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for the Graduate Specialization are described below. <p>1. Graduate Specialization in Green Energy</p> <ul style="list-style-type: none"> • To receive the Graduate Specialization in Green Energy, students must successfully complete 1 compulsory course and 3 elective courses: <ul style="list-style-type: none"> ○ Compulsory course: <ul style="list-style-type: none"> ▪ ME 659 Energy and Environment ○ Elective courses (choose 3 from the following list): <ul style="list-style-type: none"> ▪ ME 738 Special Topics in Materials: Hydrogen Storage Materials ▪ ME 751 Fuel Cell Technology 	<ul style="list-style-type: none"> grade of less than 65% in any course counts as a failure). ○ At least half of the courses used for credit must normally be Faculty of Engineering courses and the other half need to be Mechanical and Mechatronics Engineering courses. • Students in the MEng in Mechanical and Mechatronics Engineering program may choose to pursue <u>one of</u> the following Graduate Specializations: <ul style="list-style-type: none"> 1. <u>Building Systems</u> 2. <u>Materials and Advanced Manufacturing</u> 3. <u>Mechatronic Systems</u> 4. <u>Sustainable Energy</u> • A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. • All MEng Graduate Specializations in Mechanical and Mechatronics Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for the Graduate Specialization are described below. <p>1. <u>Graduate Specialization in Building Systems</u></p> <ul style="list-style-type: none"> • <u>To receive the Graduate Specialization in Building Systems, students must successfully complete 2 compulsory course and 2 elective courses. Note: No more than 1 of the 4 courses may be 500-level.</u> <ul style="list-style-type: none"> ○ <u>Compulsory courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>CIVE 507 Building Science and Technology or CIVE 707 Advanced Building Science</u> ▪ <u>ME 567 Fire Safety Engineering</u> ▪ <u>ME 654 Advanced Applied Thermal Engineering</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> ▪ ME 753 Solar Energy ▪ ME 760 Special Topics in Thermal Engineering: Low Energy Building Systems ▪ ME 760 Special Topics in Thermal Engineering: Building Energy Performance ▪ ME 760 Special Topics in Thermal Engineering: Air Pollution and Greenhouse Gases ▪ ME 760 Special Topics in Thermal Engineering: Wind Energy 	<ul style="list-style-type: none"> ▪ <u>ME 655 Advanced Building Energy Analysis</u> ▪ <u>ME 656 Advanced HVAC Systems, Equipment, and Energy Efficiency</u> ○ <u>Elective courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>CIVE 601 Engineering Risk and Reliability</u> ▪ <u>ME 562 Experimental Methods in Fluids</u> ▪ <u>ME 566 Computational Fluid Dynamics for Engineering Design</u> ▪ <u>ME 651 Heat Conduction</u> ▪ <u>ME 652 Convective Heat Transfer</u> ▪ <u>ME 653 Radiation Heat Transfer</u> ▪ <u>ME 662 Advanced Fluid Mechanics</u> ▪ <u>ME 663 Computational Fluid Dynamics</u> ▪ <u>ME 671 Fundamental Fire Dynamics</u> ▪ <u>ME 672 Advanced Fire Dynamics</u> ▪ <u>ME 673 Fire Modeling</u> <p>2. <u>Graduate Specialization in Materials and Advanced Manufacturing</u></p> <ul style="list-style-type: none"> • <u>To receive the Graduate Specialization in Materials and Advanced Manufacturing, students must successfully complete 2 compulsory courses and 2 elective courses. Note: No more than 1 of the 4 courses may be 500-level.</u> <ul style="list-style-type: none"> ○ <u>Compulsory courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ME 531 Physical Metallurgy Applied to Manufacturing</u> ▪ <u>ME 559 Finite Element Methods or ME 621 Advanced Finite Element Method</u> ▪ <u>ME 620 Mechanics of Continua</u> ▪ <u>ME 631 Mechanical Metallurgy</u> ▪ <u>ME 632 Experimental Methods in Materials Engineering</u> ▪ <u>ME 739 Manufacturing Processes Topics: Topic 15 Additive Manufacturing Design</u> ○ <u>Elective courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ME 526 Fatigue and Fracture Analysis</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	<ul style="list-style-type: none"> ▪ <u>ME 533 Non-Metallic and Composite Materials</u> ▪ <u>ME 535 Welding Metallurgy</u> ▪ <u>ME 538 Welding Design, Fabrication and Quality Control</u> ▪ <u>ME 596 Special Topics in Mechanical Engineering: Topic 12 Manufacturing of Mechatronics Materials and Components</u> ▪ <u>ME 627 Fatigue Analysis and Design</u> ▪ <u>ME 628 Fracture Mechanics</u> ▪ <u>ME 732 Thermodynamics and Phase Transformations</u> ▪ <u>ME 734 Mechanics of Composite Materials</u> ▪ <u>ME 735 Special Topics - Welding and Joining: Topic 2 Advanced Materials Joining</u> ▪ <u>ME 739 Manufacturing Processes Topics: Topic 15 Additive Manufacturing</u> ▪ <u>NANO 600 Introduction to Nanotechnology</u> ▪ <u>NANO 603 Nanocomposites</u> ▪ <u>NANO 605 Design of MEMS and NEMS</u> ▪ <u>NANO 606 Advanced MicroElectroMechanical Systems: Physics, Design & Fabrication</u> <p>3. <u>Graduate Specialization in Mechatronic Systems</u></p> <ul style="list-style-type: none"> • <u>To receive the Graduate Specialization in Mechatronic Systems, students must successfully complete 2 compulsory courses and 2 elective courses. Note: No more than 1 of the 4 courses may be 500-level.</u> <ul style="list-style-type: none"> ○ <u>Compulsory courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ECE 602 Introduction to Optimization</u> ▪ <u>ECE 650 Methods and Tools for Software Engineering</u> ▪ <u>ME 547 Robotic Manipulators: Kinematics, Dynamics and Control</u> ▪ <u>ME 640 Autonomous Mobile Robotics</u> ▪ <u>ME 649 Control of Machines and Processes</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	<ul style="list-style-type: none"> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 1 Precision Control Systems</u> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 5 Computational Intelligence</u> ○ <u>Elective courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ECE 682 Multivariable Control Systems</u> ▪ <u>ECE 780 Special Topics in Control: Topic 11 Model Predictive Control</u> ▪ <u>ME 540 Fundamentals in Neural and Rehabilitation Engineering</u> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 17 Vehicle System Dynamics</u> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 14 Electromagnetic Actuators</u> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 10 Adaptive Control</u> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 37 Human Movement Neuromechanics</u> ▪ <u>ME 780 Special Topics in Mechatronics: Topic 38 Design of a Mechatronic System</u> ▪ <u>MTE 546 Multi Sensor Data Fusion</u> ▪ <u>SYDE 575 Image Processing</u> ▪ <u>SYDE 652 Dynamics of Multibody Systems</u> ▪ <u>SYDE 655 Optimal and Learning-Based Control</u> <p>4. Graduate Specialization in <u>Sustainable Energy</u></p> <ul style="list-style-type: none"> • To receive the Graduate Specialization in <u>Sustainable Energy</u>, students must successfully complete 1 compulsory course and 3 elective courses. <u>Note: at least 3 courses total must be from the compulsory course list and the elective course list A. No more than 1 of the 4 courses may be 500-level.</u> <ul style="list-style-type: none"> ○ <u>Compulsory courses (choose at least 1 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ME 654 Advanced Applied Thermal Engineering</u> ▪ <u>ME 659 Energy and Environment</u> ○ <u>Elective course list A:</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	<ul style="list-style-type: none"> ▪ <u>ME 655 Advanced Building Energy Analysis</u> ▪ <u>ME 751 Fuel Cell Technology</u> ▪ <u>ME 753 Solar Energy</u> ▪ <u>ME 760 Special Topics in Thermal Engineering: Energy Storage</u> ▪ <u>ME 765 Special Topics in Fluid Mechanics: Topic 6 Wind Energy</u> ○ <u>Elective course list B:</u> <ul style="list-style-type: none"> ▪ <u>ME 562 Experimental Methods in Fluids</u> ▪ <u>ME 566 Computational Fluid Dynamics for Engineering Design</u> ▪ <u>ME 651 Heat Conduction</u> ▪ <u>ME 652 Convective Heat Transfer</u> ▪ <u>ME 653 Radiation Heat Transfer</u> ▪ <u>ME 662 Advanced Fluid Mechanics</u> ▪ <u>ME 663 Computational Fluid Dynamics</u> ▪ <u>ME 671 Fundamental Fire Dynamics</u> ▪ <u>ME 750 Advanced Engineering Thermodynamics</u>

How will students currently registered in the program be impacted by these changes?

Current MEng students pursuing the Green Energy Specialization will not be affected by these changes. Current MEng students who satisfy the degree requirements of one the new Graduate Specializations may obtain the Graduate Specialization by completing/submitting a program change form prior to degree completion.

Department/School approval date (mm/dd/yy): 04/05/24
Reviewed by GSPA (for GSPA use only) **date** (mm/dd/yy): 05/08/24
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Senate Graduate and Research Council

For Approval

Open Session

To: Senate

Sponsors and Presenters: Charmaine Dean
Vice-President, Research & International
Clarence Woudsma
Interim Co-Associate Vice-President, Graduate Studies and
Postdoctoral Affairs

Date of Meeting: January 27, 2025

Agenda Item: **5.2 Senate Graduate and Research Council: Faculty of Environment – Major Modifications**

Recommendation/Motion

Motion: That Senate approve the following major modifications to the Master of Development Practice Plan, effective May 1, 2025, as presented.

Summary

[Senate Graduate and Research Council](#) met on November 18, 2024 and agreed to forward the following items to Senate for approval as part of the regular agenda.

Master of Development Practice (MDP)

- a. Reducing the number of required courses from 13 to 9
- b. Removing the Graduate Studies Practicum milestone

Jurisdictional Information

This item is being submitted to Senate in accordance with [Senate Bylaw 2](#), section 4.03: "Consider, study and review all proposals for new graduate programs, the deletion of graduate programs, major changes to existing graduate programs, arrange for internal appraisals as the council shall see fit, and make recommendations to Senate thereon."

Governance Path

Environment Faculty Council approval date (mm/dd/yy): 10/24/24

Senate Graduate and Research Council approval date (mm/dd/yy): 11/18/24

Documentation Provided

Appendix: Proposed Changes

Graduate and Research Council

Prior to form submission, review the [content revision instructions](#) and information regarding [major/minor modifications](#). For questions about the form submission, contact [Trevor Clews](#), Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Environment

Program: Master of Development Practice (MDP)

Program contact name(s): Cameron McCordic, Heather Hall

Form completed by: Cameron McCordic, Heather Hall

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the [SGRC Graduate Studies Course/Milestone Form](#).

- 1) Reducing the number of required courses from 13 to 9.
- 2) Removing the Graduate Studies Practicum milestone.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

Over the last few years, a number of programmatic challenges have emerged in the delivery of the Master of Development Practice (MDP) program. These challenges have included diminishing options for appropriate practicum placements for international students enrolled in the program and a high course load requirement placed on students enrolled in the program.

To address these challenges, the SEED Director, the Associate Director of Grad Studies (professional programs), the current MDP Academic Director, and the former interim MDP Academic Director have consulted with members of the University to identify options for revising the structure, administration, and delivery of the MDP program. The following members of the University have been informally consulted in this process:

- *The Dean of the Faculty of Environment*
- *The Associate Vice-President of Graduate Studies and Postdoctoral Affairs*
- *MDP program instructors*
- *Current and former MDP students were also consulted regarding their experiences in the MDP program as part of the MDP program review process.*

The individuals consulted voiced support for the program revisions recommended in this document. The program revisions recommended in this document were also derived from recommendations made by external reviewers during the recent program review of the MDP. Please note that none of the program learning outcomes are being revised as part of the proposed MDP program revisions.

The Graduate Studies Practicum milestone is being removed from the degree requirements as it was setup in error when the program began. The requirement has been and will continue to be satisfied by successfully completing INDEV 611/DEVP 611.

Please note that the INDEV (International Development) subject code/name is also being revised to DEVP (Development Practice).

Current [Graduate Studies Academic Calendar \(GSAC\)](#) page (include the link to the web page where the changes are to be made):

<https://uwaterloo.ca/academic-calendar/graduate-studies/catalog#/programs/Bk03jR1nn>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Admit term(s)</p> <ul style="list-style-type: none"> • Fall <p>Delivery mode</p> <ul style="list-style-type: none"> • On-campus <p>Registration option(s)</p> <ul style="list-style-type: none"> • Full-time <p>Study option(s)</p> <ul style="list-style-type: none"> • Coursework <p>Length of program</p> <ul style="list-style-type: none"> • 4 terms (16 months) <p>Admission requirements: Minimum requirements</p> <ul style="list-style-type: none"> • A four-year Honours Bachelor's degree (or its equivalent) from a recognized university in a humanities, social science, health, engineering, environmental science, or business discipline, and have a minimum of 75% overall standing in the last two years of study. • English language proficiency (ELP) (if applicable) <p>Admission requirements: Application materials</p> <ul style="list-style-type: none"> • Résumé/Curriculum vitae • Supplementary information form • Transcript(s) <p>Admission requirements: References</p> <ul style="list-style-type: none"> • Number of references: 2 • Type of references: 1 academic and 1 professional, or 2 academic, or 2 professional. 1 of the letters must be from a referee who can attest to the leadership competencies of the applicant. <p>Degree requirements</p> <ul style="list-style-type: none"> • Students must complete the course and milestone requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM). 	<p>Admit term(s)</p> <ul style="list-style-type: none"> • Fall <p>Delivery mode</p> <ul style="list-style-type: none"> • On-campus <p>Registration option(s)</p> <ul style="list-style-type: none"> • Full-time <p>Study option(s)</p> <ul style="list-style-type: none"> • Coursework <p>Length of program</p> <ul style="list-style-type: none"> • <u>3 terms (12 months)</u> <p>Admission requirements: Minimum requirements</p> <ul style="list-style-type: none"> • A four-year Honours Bachelor's degree (or its equivalent) from a recognized university in a humanities, social science, health, engineering, environmental science, or business discipline, and have a minimum of 75% overall standing in the last two years of study. • English language proficiency (ELP) (if applicable) <p>Admission requirements: Application materials</p> <ul style="list-style-type: none"> • Résumé/Curriculum vitae • Supplementary information form • Transcript(s) <p>Admission requirements: References</p> <ul style="list-style-type: none"> • Number of references: 2 • Type of references: 1 academic and 1 professional, or 2 academic, or 2 professional. 1 of the letters must be from a referee who can attest to the leadership competencies of the applicant. <p>Degree requirements</p> <ul style="list-style-type: none"> • Students must complete the course and milestone requirements listed below in addition to the Graduate Academic Integrity Module (Graduate AIM).

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Coursework option: Course requirements</p> <ul style="list-style-type: none"> • Required courses: <ul style="list-style-type: none"> ○ Year 1 (Terms 1–3): core curriculum: <ul style="list-style-type: none"> ▪ INDEV 601 Foundations of Sustainable Development Practice ▪ INDEV 602 International Development: Theories and Practice ▪ INDEV 603 Global Health ▪ INDEV 604 Sustainable Cities ▪ INDEV 605 Economics for Sustainable Development ▪ INDEV 606 Energy and Sustainability ▪ INDEV 607 Methods of Sustainable Development Practice: A Systems Approach ▪ INDEV 608 Water and Security ▪ INDEV 609 Sustainability Concepts, Applications and Key Debates ▪ INDEV 611 Field Placement Project • Elective courses: <ul style="list-style-type: none"> ○ Year 2 (Term 4): students must complete 3 elective courses. ○ Normally students will complete all 3 elective courses during the Fall term (September–December). Students are encouraged to consult with the program administrator to determine an appropriate suite of courses. ○ Further details on elective courses are available from the School of Environment, Enterprise and Development (SEED) website. <p>Coursework option: Milestone requirements</p> <p>Graduate Studies Practicum</p> <ul style="list-style-type: none"> • The Practicum (INDEV 611 Field Placement) is to be completed in term 3. • Students must complete 2 one-day workshops from a choice of 3 workshops. 	<p>Coursework option: Course requirements</p> <ul style="list-style-type: none"> • Required courses: <ul style="list-style-type: none"> ○ Fall: <ul style="list-style-type: none"> ▪ <u>DEVP 601 Foundations of Sustainable Development Practice</u> ▪ <u>DEVP 602 International Development: Theories and Practice</u> ▪ <u>DEVP 609 Sustainability Concepts, Applications and Key Debates</u> ▪ <u>1 graduate-level elective course</u> ○ Winter: <ul style="list-style-type: none"> ▪ <u>DEVP 607 Methods of Sustainable Development Practice: A Systems Approach</u> ▪ <u>3 graduate-level elective courses</u> ○ Spring: <ul style="list-style-type: none"> ▪ <u>DEVP 611 Field Placement Project or a graduate-level projects course as approved by the MDP Academic Program Director and SEED Grad Officer</u> • Elective courses: <ul style="list-style-type: none"> ○ <u>DEVP 603 Global Health</u> ○ <u>DEVP 604 Sustainable Cities</u> ○ <u>DEVP 605 Economics for Sustainable Development</u> ○ <u>DEVP 606 Energy and Sustainability</u> ○ <u>DEVP 608 Water and Security</u> ○ <u>SUSM 678 Governing the Commons</u> ○ Students are encouraged to consult with the program administrator to determine an appropriate suite of courses. ○ Further details on elective courses are available from the School of Environment, Enterprise and Development (SEED) website.

How will students currently registered in the program be impacted by these changes?

Current students will be provided with the option to remain in the current version of the MDP program or switch to the new version in Winter 2025. A program coffee chat will be held with the students in Fall 2024 to discuss

the proposed changes and provide opportunity for students to ask questions and make an informed decision.

Department/School approval date (mm/dd/yy): 09/13/2024

Reviewed by GSPA (for GSPA use only) **date** (mm/dd/yy): 09/12/24

Faculty approval date (mm/dd/yy): 10/24/24

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

Senate Undergraduate Council

For Approval

Open Session

To: Senate

Sponsor and Presenter: David DeVidi
Associate Vice-President, Academic

Date of Meeting: January 27, 2025

Agenda Item: **6.1 Senate Undergraduate Council: Faculty of Mathematics – New AMATH Specialization**

Recommendation/Motion

Motion: That Senate approve the following major modification for a new specialization plan in applied mathematics, effective 1 September 2025, as presented.

Summary

[Senate Undergraduate Council](#) met on November 19, 2024 and agreed to forward the following item to Senate approval as part of the regular agenda.

New AMATH Specialization:

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 Specialization and 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.

Jurisdictional Information

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

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

Governance Path

Mathematics Faculty Council approval date (mm/dd/yy): 10/22/24

Senate Undergraduate Council approval date (mm/dd/yy): 11/19/24

Documentation Provided

Appendix: Proposed Changes

Climate & Sustainability Specialization Climate and Sustainability Specialization

Under Review | Fall 2025

Proposal Information

Workflow Status

In Progress

Senate, Senate

expand ▲

Waiting for Approval | Approval Delegate(s)

Mike Grivicic

Tim Weber-Kraljevski

Diana Goncalves

Melanie Figueiredo

Ashley Day

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.

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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 ⓘ

Academic Unit ⓘ

Faculty of Mathematics

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 ⓘ

Committee approvals

Faculty/AFIW Path(s) for Workflow ⓘ

Faculty of Mathematics

Senate Workflow

Senate Regular

Dependencies

Dependent Courses and Programs/Plans

There are no dependencies

For Recommendation**Open Session****To:** Senate Executive Committee**Sponsor/Presenter:** Genevieve Gauthier-Chalifour, University Secretary
Contact Information: gen.gauthier-chalifour@uwaterloo.ca**Date of Meeting:** January 13, 2025**Agenda Item Identification:** 7.1 Proposed Amendment to Senate Bylaws - Governance Year**Recommendation/Motion:**

That Senate gives first reading to the amendments to Senate Bylaws 1, 2, and 3 as presented in this report.

NB (for information): for the second reading of the bylaw amendments at a subsequent meeting of Senate, the following additional articles would be included with the motion to give second reading:

...

And, that Senate approve that the current year be extended to end on August 31, 2025 to facilitate a transition year, with provisions for the transition year as described in this report;

And, that Senate approve the extension of the terms of elected senators and of members of Senate committees and councils to be congruent with the revised year, as appropriate;

With all approvals subject to final approval of the proposed bylaw amendments by Senate.

Summary/Rationale:

The *University of Waterloo Act* ("the Act"), section 22(o), provides that Senate may "... enact by-laws and regulations for the conduct of its affairs."

This report proposes to shift the start of the Senate-defined year to September 1st annually, which would provide benefit to Senate in mitigating logistical issues in organizing elements of Senate governance. Firstly, Senate would benefit from maintaining continuity over the summer months where approvals may be required and where those approvals can be considered by senators and/or Senate committee and council members who are well-oriented to the mandate and business of the body; this would necessarily not be the case for newer members starting on May 1. Secondly, in the current paradigm the general elections of senators from faculty and student constituencies are required to occur in March of each year, which in turn creates considerable time pressure to have those new senators oriented and potentially also appointed to a Senate committee/council in time for the May 1 start date, with these activities occurring in the March-April period where the University already has considerable operational activity/demands. By shifting the Senate year to begin on September 1, this will provide a longer available period for important orientation and onboarding activities to occur and for those activities to be scheduled at times that where operational demands are generally lower e.g. during the May-August period. Waterloo's Senate is an outlier among Canadian universities as most have years that run either July 1-June 30 or from September 1-August 31. As well, starting the year aligns with the natural rhythm of campus life where the new year starts at the same time as when most new students commence their studies in the fall term. This recommendation would also align Senate with the decision of the Board of Governors to shift to the year beginning September 1, which was approved at the October 29, 2024 meeting of the Board.

Secretariat

The current language in Senate bylaws uses the term “year” and “academic year” interchangeably, and to simplify the former will be used consistently.

To facilitate this change, a transition year will be necessary which would include the following adaptations:

- The current Senate academic year would be extended to 16 months, running from May 1, 2024 to August 31, 2025
- The terms of current elected senators would be extended by four months
 - For all current elected senators with terms to April 30, 2025, said terms would be extended with approval of the bylaw change to August 31, 2025
 - For all current elected senators with terms to April 30, 2026, said terms would be extended with approval of the bylaw change to August 31, 2026
 - For all current elected senators with terms to April 30, 2027, said terms would be extended with approval of the bylaw change to August 31, 2027
- Where terms of office are enunciated for committees and councils of Senate, whether in bylaws or in approved terms of reference, that those terms of office be equivalently extended to align with the Senate academic year
- The terms of *ex-officio* senators would not be impacted by this change, with their terms of Senate related to the terms of appointment for their respective offices
- For the purposes of interpreting section 23 of the Act, the extension of a senator’s term these amendments will constitute an extension of their current term and will not be considered to be a new or additional term
- For the purposes of interpreting section 24 of the Act, the calculation of absences vs. regular meetings shall reflect the 16-month transition year and the additional regular meetings of Senate for the transition year
- For any issues of interpretation related to the transition year that are not enunciated within this report, those issues shall be decided by the University Secretary, who may consult the chair of Senate in making their decision. All such decisions are to be reported to Senate at the next regularly scheduled meeting.

In addition to specific bylaw amendments to adjust the Senate year, minor amendments to the Senate bylaws are included with this recommendation to align and simplify language in related sections of the bylaws.

Separately from these proposed amendments, the Secretariat plans to initiate a general review of all Senate bylaws early in 2025 in accordance with the recommendations of the Senate Governance Review, with the aim of ensuring broad currency in governance practices.

Draft Bylaw Amendments:

(strikethrough = deleted text; underline = new text)

Senate Bylaw 1

1. Interpretation

1.01 In all the bylaws of Senate,

- a. "academic year" means the twelve-month period dating from ~~1 May~~ September 1 of one ~~calendar year to 30 April~~ August 31 of the succeeding ~~calendar year~~.

...

2.01 The schedule of meetings for Senate and its committees and councils shall be approved by the chair of Senate and published by the Secretariat prior to the new ~~academic~~ year.

...

3.01 General meetings

Senate shall normally hold eight (8) general meetings during each academic year. Notice of each meeting shall be communicated to the university community in such places and ways as may be designated from time to time by Senate.

Senate Bylaw 2

...

1.04(e) To present to Senate, normally at the last regular meeting in the academic year in April, a list of nominations for the committees and councils of Senate.

...

1.05 The committee shall normally hold ~~ten (10)~~ regular meetings during each academic year equal to the number of regular meetings of Senate, each such meeting to be held approximately two weeks prior to the date of each general meeting of Senate. Special meetings of the committee shall be called by the chair of the committee.

Senate Bylaw 3

...

1.01 The university secretary or designate shall act as chief returning officer for the purpose of conducting the election of members of Senate. As chief returning officer, the university secretary or designate has overall responsibility for the general conduct of such elections and by-elections, which shall be by secret ballot. Without restricting the generality of the foregoing, the chief returning officer shall:

...

(b) Call for nominations and when doing so inform the university community of the names of those members of Senate whose terms of office expire ~~on 30 April~~ of that year and whether such members are eligible for a further term of service.

Jurisdictional Information:

This item is submitted to Senate in accordance with the *University of Waterloo Act*, section 22(o), which empowers Senate "...to enact by-laws and regulations for the conduct of its affairs."

Senate Bylaw 1 states the procedural requirements for the passage of new bylaws and amendments to existing bylaws:

14. Bylaws – general

14.01 The passage of a new bylaw or amendment(s) to an existing bylaw is accomplished in two readings by Senate. At the first reading, such discussion as is deemed appropriate by Senate shall take place. At the second reading, further discussion may take place and the vote on the document shall be taken. The two readings shall take place at different, but not necessarily consecutive, meetings of Senate.

14.02 No proposed bylaw or amendment(s) will be given reading unless it has been bound into or accompanies the agenda portfolio distributed in advance of the meeting.

Secretariat

14.03 Any proposed bylaw or amendment(s) shall include the proposed wording of the bylaw or amendment(s), and where appropriate, a summary of the reasons for such bylaw or amendment(s).

14.04 In order to be approved by Senate, any new bylaw or amendment(s) to bylaws must receive the affirmative vote of at least two-thirds of the members of Senate present and voting at the meeting.

Governance Path:

Senate Executive Committee – January 13, 2025

Senate – January 27, 2025 and March 3, 2025 (prospective)

For Approval

Open Session

To: Senate

**Sponsor/Presenter and
Contact Information:**

Christine McWebb, Associate Vice-President, Faculty Planning and
Policy

cmcwebb@uwaterloo.ca

Chris Read, Associate Provost, Students

chris.read@uwaterloo.ca

Michelle Hollis, Chief Human Resources Officer

mhollis@uwaterloo.ca

Date of Meeting: January 27, 2025

Agenda Item Identification: **8.1 Reporting on Government Directives – Bill 166: Anti-Racism/Anti-Hate Directive – Amendment to Policy 33-Ethical Behaviour**

Recommendation/Motion:

That Senate approve the amendments to Policy 33 – Ethical Behaviour, as presented in the attached report, for recommendation to the Board of Governors for approval.

Summary:

In 2024, Universities and Colleges in Ontario received government Directives related to two legislative changes: Bill 166, *Strengthening Accountability and Student Supports Act, 2024*, to amend the *Ministry of Training, Colleges and Universities Act*; and Bill 185, the *Cutting Red Tape to Build More Homes Act*.

The focus of the attached report is on the amendments to Policy 33- Ethical Behaviour resulting from the Bill 166 anti-racism/anti-hate Directive and provides an overview of work, deliverables, consultation and engagement. Requirements and resultant work to comply with additional Bill 166 Directives and Bill 185 related Directive have also been prepared and will be reported separately to governance bodies as appropriate.

Governance Path:

As presented in the attached report.

Next Steps:

In light of the prescribed implementation deadline of January 31, 2025, required policy amendments will be presented to the Executive Committee of the Board for approval, with a subsequent report to the Board of Governors at its meeting February 4, 2025.

Documentation Provided:

- Appendix A - Report on Government Directive – Bill 166: Anti-Racism/Anti-Hate Directive
- Appendix B - Proposed Amendment to Policy 33 – Ethical Behaviour (FRC and SRC approved)

Appendix A - Report on Government Directive – Bill 166: Anti-Racism/Anti-Hate Directive

Bill 166

Bill 166 received Royal Assent on May 16, 2024. This legislation amended the *Ministry of Training, Colleges and Universities Act* (“Act”) with new requirements for Ontario’s publicly assisted colleges and universities. Bill 166 mandated two categories of policy requirements for universities: (A) student mental health policies; (B) anti-racism/anti-hate policies. On September 9, 2024, the University received two separate Ministerial Directives issued pursuant to the legislation outlining the specific required content and processes related to these two categories of policies. Each Directive established a deadline of January 31, 2025 for implementation of the requirements. Each Directive also established annual reporting requirements (Board, public, Ministry) on the effectiveness and implementation of the policies, beginning January 31, 2026.

A Directive related to Bill 166, issued on August 14, 2024, required institutions to provide students with information about educational costs associated with attending the institution (Cost of Educational Material Directive). On December 20, 2024, the University received a revised Directive on the Costs of Educational Materials.

Bill 166 – Anti-Racism and Anti Hate Directive

The September 9, 2024 MCU Directive outlined multiple prescriptive requirements for institutions’ anti-racism/anti-hate rules and policies. A two-pronged approach was necessary to meet all Directive requirements: creation of a new centralized platform to satisfy some of the requirements; and amendments to Policy 33 to satisfy all other requirements.

A working group included:

- Associate Vice-President, Faculty Planning and Policy
- Chief Human Resources Officer
- Associate Provost, Students
- Associate Provost, Campus Support and Accessibility
- Associate Vice-President, Equity, Diversity, Inclusion and Anti-Racism
- Associate Vice-President, Communications
- Associate Vice-President, Indigenous Relations
- General Counsel and Legal Counsel - LIS
- University Secretary
- Director, Policy Planning and Decision Support
- Associate University Secretary, Policy and Special Projects
- Associate Director, Strategic Initiatives

Strategic amendments to Policy 33 were proposed to both the Faculty Relations Committee (FRC) and Staff Relations Committee (SRC), similar to the approach that was taken with Policy 33 and *Bill 26: Strengthening Post-secondary Institutions and Students Act*, in 2023.

Proposals for strategic and precision amendments to Policy 33 were presented to FRC and SRC at their November 14th and November 15th, 2024, meetings, for feedback. The proposed amendments to Policy 33 to comply with the Directive requirements were able to leverage work undertaken in 2021 as part of

a review of Policy 33 and draft submissions at the time that had subsequently stalled due to extraneous circumstances.

Following feedback received from both FRC and SRC and subsequent discussions, the enclosed amendments to Policy 33 are provided on approval of both committees and will be presented to Senate and the Board of Governors for approval.

Additionally, the anti-racism/anti-hate Directive required the creation of a centralized platform. The required centralized platform on the EDI-R website, which will continue to be updated prior to January 31, 2025, can be found here: <https://uwaterloo.ca/equity-diversity-inclusion-anti-racism/anti-racism-and-anti-hate-supports>

Consultation and Engagement

Groups and Governance Bodies	Completion Date
Info Group ASUs <ul style="list-style-type: none"> Proposed plan for information 	November 12, 2024
Deans' Council Plus meeting <ul style="list-style-type: none"> Proposed plan for information 	November 13, 2024
FRC meeting <ul style="list-style-type: none"> Memo for Policy 33 changes provided for discussion 	November 14, 2024
SRC meeting <ul style="list-style-type: none"> Memo for Policy 33 changes provided for discussion 	November 15, 2024
Feedback provided for draft content for centralized platform to Working Group	November 22, 2024
GSRC meeting <ul style="list-style-type: none"> Memo for Policy 33 changes provided for discussion 	December 3, 2024
USRC meeting <ul style="list-style-type: none"> Memo for Policy 33 changes provided for discussion 	December 4, 2024
Last day to submit feedback to Working Group	December 6, 2024
FRC and SRC meeting <ul style="list-style-type: none"> Revised Memo for Policy 33 changes for approval 	December 12, 2024

FRC meeting and approval with minor changes	December 17, 2024
Final version of policy 33 amendment presented to SRC	December 19, 2024
Final version of centralized platform presented for review by Working Group	December 19, 2024
SRC final votes on Policy 33 Amendments	December 20, 2024
CUPE 793, CUPE 5524, CUPE 5524.01, OPSEU 231	December 20, 2024
Deans' Council Plus meeting <ul style="list-style-type: none"> Final version of policy amendment and centralized platform for information and approval (of Policy 33 changes) 	January 8, 2024
Community and Culture Committee <ul style="list-style-type: none"> Final version of policy amendment and centralized platform for information and endorsement for Board approval 	January 13, 2025
Senate Executive Committee <ul style="list-style-type: none"> Final version of policy amendment and centralized platform for information for information (as part of Senate agenda) 	January 13, 2025
GSRC <ul style="list-style-type: none"> Report for Information 	January 14, 2025
USRC <ul style="list-style-type: none"> Report for Information 	January 15, 2025
Senate <ul style="list-style-type: none"> Final report and Final version of policy amendment for approval 	January 27, 2025
Board of Governors Executive <ul style="list-style-type: none"> Written Final report for information and approval 	January 31, 2025

Appendix B - Proposed Amendment to Policy 33 – Ethical Behaviour (FRC and SRC Approved)

University of Waterloo Policy 33

Ethical Behaviour

Established: 19 May 1982
Last Updated: 6 June 2023
Class: FS

GENERAL PRINCIPLES

The University is an autonomous community which exists to further the pursuit and dissemination of knowledge and understanding through scholarship and teaching. The University aims to ensure an environment of tolerance and respect and believes that the right of individuals to advance their views openly must be upheld throughout the University. The realization of these intentions requires respect for the following general principles:

- That each member of the University endeavour to contribute to the existence of a just and supportive community based on equality and respect for individual differences.
- That the University of Waterloo is committed to providing an environment which supports and rewards its members on the basis of such relevant factors as work performance and achievement. Harassment, discrimination and the abuse of supervisory authority, for example, are inimical to this environment. Further, as required by the Ontario Human Rights Code and the Occupational Health and Safety Act, the University has a responsibility to provide an environment free from harassment and discrimination, and accordingly must deal effectively, quickly and fairly with any situation involving claims of harassment or discrimination that come to its attention.
- That services, benefits, opportunities, and facilities offered by the University be compatible with its purposes and be provided to all persons in the University community with the relevant qualifications. Thus, such provisions shall not be denied wholly or partly on irrelevant or prohibited grounds.

[**Note:** Under the Ontario Human Rights Code, a person has the right to equal treatment in a number of areas (i.e., services, goods and facilities, accommodation/housing, employment, contracts, membership in trade unions and vocational associations), free from discrimination based on the following prohibited grounds: race; ancestry; place of origin; colour; ethnic origin; citizenship; creed/religion; sex; sexual orientation; age; record of offences; marital status; same-sex partnership status; family status; receipt of public assistance; mental or physical handicap.] The Accessibility for Ontarians with Disabilities Act prescribes accommodation for those with mental or physical handicaps.

- That the University supports academic freedom for all members of the University community. Academic freedom carries with it the duty to use that freedom in a manner consistent with the scholarly obligation to base teaching and research on an honest and ethical quest for knowledge. In the context of this policy, ‘academic freedom’ refers to academic activities, including teaching and scholarship, as is articulated in the principles set out in the Memorandum of Agreement between the FAUW and the University of Waterloo, 1998 (Article 6). The academic environment which fosters free debate may from time to time include the presentation or discussion of unpopular opinions or controversial material. Such material shall be dealt with as openly, respectfully and sensitively as possible.
- [The University has a robust framework to protect and promote open discussion and free inquiry in University Governing Documents including Policy 8, Freedom of Speech , and the Memorandum of Agreement between the Faculty Association of the University of Waterloo and the University of Waterloo.](#)
- That no member of the University community (faculty, staff, student) unduly interfere with the study, work or working environment of other members of the University or any aspect of another’s University activity. This shall be taken to apply to the campus of the University and to official off-campus functions of the University, such as course- or program-related field trips and co-op employment.
- That those with supervisory authority (academic or employment) use such authority, both on campus and off, solely for the purposes explicitly stated or implied in University policies and with regard to the overall aims and purposes of the University.
- [This policy applies to members of the University community and to visitors, including guest speakers.](#)

SPECIFIC PRINCIPLES

Without limiting the generality of Section I above, the following shall be taken as violations of this policy, and may also be in contravention of the Ontario Human Rights Code:

- ***Discrimination*** is defined as any action or behaviour that results in adverse or preferential treatment related to those grounds prohibited under the Ontario Human Rights Code.
- ***Harassment*** is defined as engaging in a course of vexatious comment or conduct that is known, or ought reasonably to be known, to be unwelcome.
- ***Sexual Harassment*** includes comment or conduct where acceptance of sexual advances is a condition of education or employment, or where rejection of sexual advances negatively impacts decisions that concern the recipient (e.g., grades, performance evaluation or any academic or employment decisions) or where unwelcome sexual advances, comment, conduct or communications interfere with the recipient’s work or study.

- ***Sexual Misconduct by an Employee Toward a Student**** means, in relation to a student of the University
 - (a) Physical sexual relations with the student, touching of a sexual nature of the student or behaviour or remarks of a sexual nature toward the student by an employee of the University where:
 - (i) The act constitutes an offence under the *Criminal Code* (Canada) (including, but not limited to sexual assault, aggravated sexual assault, sexual assault with a weapon, voyeurism, sexual exploitation, sexual exploitation of a person with a disability, sexual interference, child pornography, criminal harassment/stalking and invitation to sexual touching as examples); or
 - (ii) The act infringes the right of the student under clause 7(3)(a) of the *Human Rights Code* to be free from a sexual solicitation or advance by a person in a position to confer, grant or deny a benefit or advancement to the student; or
 - (iii) The act constitutes sexual misconduct as defined in this policy, or contravenes this policy or any other rule or other requirement of the University respecting sexual relations between employees and students; or
 - (iv) The act constitutes Sexual Harassment or Sexual Violence as defined in Policy 42 – Prevention of and Response to Sexual Violence.

Or,

- (b) Any conduct by a University employee that infringes the right of the student under clause 7(3)(b) of the *Human Rights Code* to be free from reprisal or threat of reprisal for the rejection of a sexual solicitation or advance.
- A ***'poisoned environment'*** (or one that is intimidating, hostile or offensive) can be created based on any of the prohibited grounds under the Ontario Human Rights Code, and can be described as comment or conduct that is contrary to the aims of maintaining a supportive, respectful and tolerant environment.

And the following may be in contravention of the Occupational Health and Safety Act:

- ***Workplace Harassment*** is defined as engaging in a course of vexatious comment or conduct against a worker in a workplace that is known, or ought reasonably to be known, to be unwelcome.

VIOLATIONS, REDRESS

Members of the University community have the right to lodge complaints and to participate in proceedings without reprisal or threat of reprisal for so doing. Those with supervisory authority (academic or employment) are expected to be proactive in promoting respect for the general principles articulated in Section I and, with assistance and guidance from the Conflict Management and Human Rights Office (CMAHRO), are responsible for dealing with alleged

violations of those principles. Such authority shall be taken to include permanent, temporary or delegated supervision of any faculty or staff member or student.

Those who receive complaints or who perceive what they believe to be violations of this policy shall act promptly to notify an appropriate administrative officer, normally one's immediate supervisor, the department Head, Chair or Director, to provide or initiate the appropriate remedial or disciplinary measures. If the complaint pertains to that individual, it should be directed to the next administrative level (Dean, Associate Provost, Vice-President). Those dealing with alleged violations of this policy shall be guided by principles of fairness and natural justice. Complaints that are found after investigation to be of a frivolous and/or vexatious nature will not be pursued.

[Complaints filed by students, faculty, and staff will follow the Complaints Process. Anyone who has exhausted the processes internal to the University of Waterloo and/or anyone who is ineligible to file a complaint under the Complaints Process may have recourse to the Ontario Ombudsman.](#)

Disciplinary measures resulting from infringements of this policy (other than a finding of Sexual Misconduct by an Employee Toward a Student) may be appealed under the grievance processes for staff (Policy 36), students (Policies 70/71), faculty (Article 9 of the Memorandum of Agreement). Members of CUPE 793 should refer to Article 16 of their Collective Agreement.

Disciplinary processes resulting from a finding of Sexual Misconduct by an Employee Toward a Student are outlined in Policy 18 for staff, Article 8 of the Memorandum of Agreement between the Faculty Association of the University of Waterloo and the University of Waterloo (MOA) for faculty, the CUPE 793 Collective Agreement and the OPSEU Collective Agreement. In these circumstances, where a decision is made to investigate, careful consideration of whether an internal or external investigator with expertise on the subject-matter, will be retained, giving thought to the complexity of the complaint, potential impacts on procedural timelines and the expressed wishes of the parties to the complaint. Both the complainant and the respondent to the complaint will have the opportunity to challenge the appointment of the investigator with reasons.

Disciplinary measures resulting from a finding of Sexual Misconduct by an Employee Toward a Student range, up to and including the termination of employment. Where disciplinary measures resulting from a finding of Sexual Misconduct by an Employee Toward a Student include the termination of employment, or where resignation occurs as a result of a finding of Sexual Misconduct by an Employee Toward a Student, the employee shall not be entitled to notice of termination, termination pay, or other compensation or restitution as a result of the discharge or disciplinary measure, and the employee shall not be subsequently re-employed by the University. Disciplinary measures resulting from a finding of Sexual Misconduct by an Employee Toward a Student are final.

Individuals who believe they have been treated in violation of the Ontario Human Rights Code have the right to proceed directly to the Human Rights Tribunal of Ontario. If taken, such a step does not relieve or alter UW's responsibility to take appropriate administrative action to address the alleged violation.

[**Note:** Complainants may find it helpful to consult the University Secretariat (Needles Hall) or refer to organization charts on its website for assistance in identifying the immediate supervisor of a particular individual. Regarding courses taught at, or programs, facilities and residences administered by the Federated & Affiliated Colleges, faculty, staff and students should consult the individual designated by the appropriate College.]

ADVICE AND SUPPORT

Any member of the University community who has reason to believe that he/she has been treated in violation of a principle stated in this policy is urged to contact one of the primary on-campus resources identified below for information or advice.

Conflict Management and Human Rights Office. The CMAHRO serves as the focal point and primary resource to all members of the University community on matters involving ethical behaviour and human rights issues. That Office sponsors the University Conflict Resolution Support Program, comprised of the:

- Resolution Support Program (RSP), which provides one-on-one support and advice by trained volunteers to those considering or initiating a complaint under UW policies;
- Conflict Intervention Program (CIP), whose members work with parties to a dispute, in an attempt to mediate and resolve problems informally and as close to source as possible.

AccessAbility Services. The office has a mandate to ensure equitable opportunity for students with disabilities. In accordance with the *Accessibility for Ontarians with Disabilities Act* and in partnership with all university departments, the office promotes access to all programs, services, and facilities at the university.

University of Waterloo Special Constable Service. In situations involving unwanted touching or aggressive and threatening behaviour, complainants are strongly advised to consider contacting UW Special Constable Service (ext. 22222, or 519-888-4911; Commissary), preferably at the outset.

Sexual Violence Prevention and Response Office. The Sexual Violence Prevention and Response Office supports all members of the University of Waterloo campus community who have experienced or been impacted by sexual violence.

A **person of responsibility** (e.g., Head, Chair or Director) within one's own department or school.

Members of the University community may also wish to consult the organizations that represent their interests: the Faculty Association; the Staff Association; CUPE Local 793; the Waterloo Undergraduate Student Association; the Graduate Student Association. A comprehensive list of on-campus resources, including contact names, locations and telephone numbers, is available from the University Secretariat and posted on the Human Rights, Equity and Inclusion [website](#).

* The portions of this policy related to the passage of Bill 26, *Strengthening Post-secondary Institutions and Students Act, 2022* will be reconsidered and revised (if deemed necessary) in

accordance with the FS Class policy process outlined in Policy 1 – Initiation and Review of University Policies on or before 1 July 2024.

* The portions of this policy related to the passage of Bill 166, *Strengthening Accountability and Students Support Act, 2024* will be reconsidered and revised (if deemed necessary) in accordance with the FS Class policy process outlined in Policy 1 – Initiation and Review of University Policies on or before 4 February 2026.

* This policy and associated procedures will be reviewed at least every five years, as required by the *Ministry of Training, Colleges and Universities Act*.

Appendix A Complaints Process and Annual Report Requirements

Complaints Process

<u>Who</u>	<u>When</u>	<u>What</u>
<u>Any member of the University Community (Complainant)</u>	<u>Within one year of the incident or last of a series of incidents.</u> <u>Deadline may be extended where there are compelling reasons or the complaint is of Sexual Violence as that term is defined in Policy 42.</u>	<u>Provide the complaint and any other relevant information to the appropriate administrative officer, normally the immediate supervisor of the Respondent, the department Head, Chair or Director (for employees) or the Associate Dean (for students). If the complaint pertains to that individual, it should be directed to the next highest supervisory level.</u> <u>Complaints containing allegations of ethical misconduct made anonymously may also be submitted as described above.</u> <u>Complaints must contain sufficient detail to allow for a preliminary assessment and subsequent investigation, if necessary.</u>
<u>Decision-Maker</u> <u>Normally:</u> <ul style="list-style-type: none"> - <u>Immediate supervisor for staff</u> - <u>Dean or delegate for faculty</u> - <u>Associate Dean for students</u> 	<u>On receipt of complaint, conduct preliminary assessment.</u>	<u>Conduct a preliminary assessment to determine whether the allegations could constitute a violation of this policy. If so, address whether accommodations and/or interim measures are necessary.</u>
<u>Decision-Maker</u> <u>Normally:</u>	<u>Within 30 working days of having</u>	<u>Advise the Complainant whether the Complaints Process will proceed beyond the preliminary assessment to an investigation, along with an outline of</u>

<ul style="list-style-type: none"> - Immediate supervisor for staff — Dean or delegate for faculty - Associate Dean for students 	<p>received the complaint, communicate preliminary assessment to Complainant.</p>	<p>the process, next steps, estimated time (no more than 12 months) and the nature and duration of interim measures, if appropriate.</p> <p>If the Complaints Process will proceed, notify the respondent of the complaint and the decision to proceed beyond the preliminary assessment with the complaint, along with an outline of the process, next steps, estimated time (no more than 12 months); and the nature and duration of interim measures, if appropriate. If the complaint will not proceed, the Complainant will be provided with the reasons for not proceeding.</p>
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[If Investigation Proceeds](#)

Who	When	What
<p>Decision-Maker Normally:</p> <ul style="list-style-type: none"> - Immediate supervisor for staff - Dean or delegate for faculty - Associate Dean for students 	<p>Within 14 calendar days of the notification of decision to investigate.</p>	<p>Advise parties of the proposed investigator, and mandate for the investigation. Provide both the Complainant and the Respondent with the opportunity to challenge the appointment of the investigator, with reasons.</p>
<p>Investigator</p>	<p>Within 90 calendar days of the investigator receiving the complaint and mandate of the investigation, and every 90 days thereafter as necessary*.</p>	<p>Undertake investigation and provide an investigation report, or an update as to the status of the investigation, to the Decision-Maker.</p>
<p>Decision-Maker Normally:</p> <ul style="list-style-type: none"> - Immediate supervisor for staff - Dean or delegate for faculty - Associate Dean for students 	<p>Within 14 calendar days of receiving the investigation report.</p>	<p>Share with each party the results of the investigation through the creation and communication of a summary investigation report.</p>
<p>Complainant and Respondent</p>	<p>Within 7 calendar days of receiving the</p>	<p>Prepare a written response to the summary investigation report for the Decision-Maker to</p>

	summary investigation report.	be considered in determining any potential corrective action.
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[*With the matter fully resolved by the Decision-Maker within 12 months of submission of the complaint.](#)

Outcomes

<u>Who</u>	<u>When</u>	<u>What</u>
<u>Decision-Maker</u> Normally: - <u>Immediate supervisor for staff</u> - <u>Dean for faculty</u> - <u>Associate Dean for students</u>	<u>Within 30 calendar days of receiving the investigation report.</u>	<u>Decide whether corrective action, including discipline, is appropriate. Communicate decisions to the Complainant and Respondent.</u>

[* Timelines expressed above may be adjusted by the Decision-Maker with proper written notice to the parties, including expected adjusted timelines.](#)

[Individuals may appeal or grieve corrective action, including discipline, and other administrative decisions resulting from the application of this policy, in accordance with their rights where permitted under the following University governing documents.](#)

<u>CUPE 793 members</u>	<u>Collective Agreement between the University and CUPE Local 793</u>
<u>OPSEU members</u>	<u>Collective Agreement between the University and OPSEU (TBD)</u>
<u>Represented faculty members</u>	<u>Memorandum of Agreement between the University and the Faculty Association of the University of Waterloo</u>
<u>Staff</u>	<u>Policy 36 – Dispute Resolution for University Support Staff</u>
<u>Students</u>	<u>Policy 72 – Student Appeals</u>
<u>Employees not covered by the above policies and agreements, and others</u>	<u>May have recourse to the Ontario Ombudsman, and may exercise any legal rights they have under Canadian Law.</u>

Annual Report Requirements

[An annual report on the implementation and effectiveness of Policy 33 and its procedures will be submitted to the Board of Governors, as required by law. The report must be made publicly available by](#)

January 31 of each year and submitted to the Minister. The content of the annual report will include, at a minimum, the following legally required content:

- The number and type of complaints reported by students, faculty, or staff including a general description/categorization of the complaints, including the number of complaints that do not proceed to a review.
- As applicable, the associated Code group and the sub-category.
- Outcomes of these incidents including response and resolution timelines (e.g., the number of months to resolve a complaint), findings of investigations, disciplinary measures taken and any involvement of law enforcement. –

For Information

Open Session

To: Senate

Sponsor/Presenter: Vivek Goel, President and Vice-Chancellor
Contact Information: president@uwaterloo.ca

Genevieve Gauthier-Chalifour, University Secretary
gen.gauthier-chalifour@uwaterloo.ca

Date of Meeting: January 27, 2025

Agenda Item Identification: 8.2 Bill 166 and Bill 185 - Report on Compliance Activity

Recommendation/Motion:

The following and the attached report are presented for Senate's information and awareness.

Summary:

In 2024, Universities and Colleges in Ontario received government Directives related to two legislative changes: Bill 166, *Strengthening Accountability and Student Supports Act, 2024*, to amend the *Ministry of Training, Colleges and Universities Act*; and Bill 185, the *Cutting Red Tape to Build More Homes Act*.

Agenda Item 8.1 concerns the Policy 33-Ethical Behaviour amendments and the creation of a centralized platform resulting from the anti-racism/anti-hate Bill 166 Directive and provides an overview of the work, deliverables, consultation and engagement of that Directive.

The focus of the attached report concerns the requirements and resultant work to comply with all additional Bill 166 Directives and the Bill 185 related Directive.

Governance Path:

As presented in the attached report.

Next Steps:

All Directive work outlined in the attached Report will be finalized prior to the January 31st 2025 deadline and reported to the Board for information at its meeting February 4, 2025.

Documentation Provided:

- Appendix A: Bill 166 and Bill 185 - Report on Compliance Activity

Appendix A: Bill 166 and Bill 185 - Report on Compliance Activity

Overview and Highlights

In 2024, Universities and Colleges in Ontario received government Directives related to two legislative changes: Bill 166, *Strengthening Accountability and Student Supports Act, 2024* and Bill 185, the *Cutting Red Tape to Build More Homes Act*. This report provides an overview of the activities to respond to requirements of the Directives related to cost of educational materials, student mental health, and student housing.

Directives

Bill 166 received Royal Assent on May 16, 2024. This legislation amended the *Ministry of Training, Colleges and Universities Act* ("Act") with new requirements for Ontario's publicly assisted colleges and universities.

A Directive related to Bill 166, issued on August 14, 2024, required institutions to provide students with information about educational costs associated with attending the institution (Cost of Educational Material Directive). On December 20, 2024, the University received a revised Directive on the Costs of Educational Materials. The Directive established a deadline of January, 2025 for implementation of the requirements.

Bill 166 also mandated two categories of policy requirements for universities: (A) student mental health policies; (B) anti-racism/anti-hate policies. On September 9, 2024, the University received two separate Ministerial Directives issued pursuant to the legislation outlining the specific required content and processes related to these two categories of policies. Each Directive established a deadline of January 31, 2025 for implementation of the requirements. Each Directive also established annual reporting requirements (Board, public, Ministry) on the effectiveness and implementation of the policies, beginning January 31, 2026.

In June 2024, the Ontario legislature passed Bill 185 - the *Cutting Red Tape to Build More Homes Act, 2024*. When the Bill was introduced, it was communicated that there would be new requirements for institutions with respect to student housing. On July 15, 2024, the University received a memo from the Deputy Minister of Colleges and Universities that outlined policy and data requirements for the University.

Bill 166 - Cost of Educational Materials Directive

The Directive requirements were discussed at DC Plus: September 18, 2024 and PVP. The AVPA is aware of the revised directive issued December 20th, 2024, and judges that it does not require a change of course in the work already done.

In response to the Directive, a decision was made to explore the use of the Common Course Outline Tool to fulfill the requirements for transparency of course materials fees. It was recognized that additional approaches would also be needed to capture fees not covered in individual courses. The Office of the AVPA prepared communications in alignment with the directive requirements, including in coordination with GSPA. A committee reviewed the Directive requirements and explored the administrative requirements for reporting with the AFIWs.

The AVPA tasked an existing Outline Working Group with improving the Outline tool to (among other things) make reporting of course expenses on syllabi easy for instructors at the same time it developed proposals for updating the Senate requirements for course outlines. Programs for which there are predictable expenses that are used in multiple courses (e.g., studio or lab equipment) are ensuring that such expenses are clearly articulated and up-to-date on program web pages.

The Directive requires annual reporting to the Board on the percentage of courses that include information on the costs of educational materials.

Senate

Bill 166 – Student Mental Health Directive

The September 9, 2024 MCU Directive required universities to publish their student mental health policies. The Directive did not mandate the form of the “policy,” but did outline that it must be a centralized platform including all legislative/Directive requirements. To satisfy the Directive the University created a student mental health framework. The student mental health framework, which will be updated prior to January 31, 2025, can be found here: <https://uwaterloo.ca/campus-wellness-resources/about-student-health-and-well-being>

A working group included:

- Associate Provost, Students
- Director, Strategic Initiatives, Office of the Vice-President, Academic and Provost
- Executive Director, Campus Wellness Resources
- Director, Internal and Leadership Communications
- Secretariat Resource

The Directive also requires an annual report to the Board, the public, and the Ministry on the effectiveness and implementation of the University’s student mental health framework beginning January 31, 2026. This process will be in accordance with the Directive requirements.

An overview of the Student Mental Health Framework is presented for information.

Consultation and Engagement – Bill 166: Student Mental Health Framework

Groups and Governance Bodies	Completion Date
Legislative Compliance Committee formed	September 30, 2024
PVP	October 8, 2024
PVP	October 22, 2024
PVP	November 12, 2024
Info Group	November 12, 2024
Campus Wellness Student Advisory Group	November 19, 2024
GSRC	December 3, 2024
USRC	December 4, 2024
DC Plus	December 11, 2024
Community & Culture (for information)	January 13, 2025
Senate Executive Committee (for information)	January 13, 2025
DC Plus (Finalized Version Review)	January 22, 2025
Senate (for information)	January 27, 2025
Board (for information)	February 4 th , 2025

Bill 185 - Student Housing Policy and Data Requirements – Directive

In June 2024, the Ontario legislature passed Bill 185 - the *Cutting Red Tape to Build More Homes Act, 2024*. When the Bill was introduced, it was communicated that there would be new requirements for institutions with respect to student housing. On July 15, 2024, the University received a memo from the Deputy Minister of Colleges and Universities that outlined policy and data requirements for the University.

To satisfy the Directive requirements, the University: (1) submitted the required student housing survey in November, 2024; (2) created a student housing “framework.” The student housing framework, which will be updated prior to January 31, 2025, can be found here <https://uwaterloo.ca/campus-housing/about#studenthousingframework>

Senate

An overview of the Student Housing Framework is presented for information.

Consultation and Engagement – Student Housing Framework

Groups and Governance Bodies	Completion Date
DC Plus	October 30, 2024
Info Group ASUs	November 2024
WUSA//USRC	November 2024
GSA/GSRC	November 2024
AFIW	November 2024
Student Awards & Financial Aid	November 2024
Marketing & Undergraduate Recruitment (MUR)	November 2024
DC Plus	January 8, 2025
Community & Culture (for information)	January 13, 2025
Senate Executive Committee (for information)	January 13, 2025
Senate (for information)	January 27, 2025
Board (for information)	February 4 th , 2025

For Information**Open Session**

To:	Senate
Sponsor:	Chris Houser, Dean of Science
Contact Information:	chouser@uwaterloo.ca
Presenter:	Chris Houser, Dean of Science
Contact Info:	chouser@uwaterloo.ca
Date of Meeting:	January 27, 2025
Item Identification:	9.1 Proposed amendments to the Constitution and By Laws of the Science Faculty Council and Assembly

Recommendation/Motion:

That Senate approve the amendment to the Constitution and By Laws of the Science Faculty Council and Assembly, as presented.

Summary:

In November 2023, Senate approved amendments to the Constitution and By Laws of the Science Faculty Council which brought the Faculty's constitution in line with the current structure and operations of the Faculty Council, including revisions to the membership of the Faculty Council and adding provision of electronic voting among other amendments.

In Fall 2024, the Faculty Council approved an amendment to the membership of said council to increase undergraduate student representation. In accordance with the Faculty's constitution, the amendment was approved first by the Faculty Council (November 8, 2024) and thereafter by the Science Faculty Assembly via electronic vote (November 8-18, 2024). These amendments met the vote threshold requirements established under the Constitution, having been passed unanimously by the Council with the requirements being "...not less than two-thirds of the members of the Council", and with 84.9% support at the assembly where the requirement is "...a confirming majority vote within the Assembly".

According to Senate Bylaw 1, section 15.01, Faculty constitutions require the approval of Senate:

Each faculty and each academic department and school of the university may adopt a formal constitution governing its operations, provided that each such constitution and any amendments thereto shall be inoperative and ineffective until approved by Senate. No provision of the constitutions shall be inconsistent with any provisions of [The University of Waterloo Act, 1972](#), as amended, and no provision of any constitution shall be exempt from the provisions of any of the bylaws or established policies of the university which are within the final jurisdiction of Senate, except as expressly approved by Senate.

Governance Path:

- Senate meeting of January 27, 2025

Proposed amendment

(strikethrough = deleted text; underline = new text)

...

A. Council

- i) The President and Vice-President, Academic and Provost.
- ii) The Dean of Science and the Associate/Assistant Deans of Science.
- iii) The Chair of Council (three-year term (renewable) elected from Members of Science Faculty Council).
- iv) A Secretary of Council (the Administrative Officer for the Faculty serves in this role).
- v) The Chair or Director of each teaching department or School in the Faculty of Science, the Director of the Guelph-Waterloo Centre/Program for Graduate Work in Chemistry (GWC)², Director of Sci/Bus Program and Aviation Programs Manager.
- vi) Members of faculty elected from each teaching department and the Schools of Optometry and Pharmacy, in number equal to one member for every five full-time regular faculty members (or fraction thereof) in the Department or School. All elections shall be for a two-year term and shall be carried out and reported to the Secretary before the end of the Spring term.
- vii) (Two) Science staff members, one representative from the administrative staff and one representative from the technical staff, elected for a three-year term (renewable).
- viii) ~~(Two) Science undergraduate students appointed by the Science Society, typically the President of Science Society and one other member of the Executive, appointed by the Sci Soc President, for a one-year term.~~
Five (5) Science undergraduate students
 - a. Two (2) Faculty of Science undergraduate students appointed for a one-year term by the Science Society President from amongst the members of the executive of the Science Society, typically the President and one other member
 - b. Two (2) Faculty of Science undergraduate students elected at-large for a one-year term, elected through a vote of the Science Faculty undergraduate student body. Election to be administered by the Science Society.
 - c. The current Undergraduate Science Faculty Senator, who will serve *ex-officio* for the duration of their term on Senate.
- ix) Two Science graduate students to be elected by the end of the Spring term by the Graduate Student Association – University of Waterloo, each elected for a two-year term.
- x) One Postdoctoral Fellow for a one-year term.
- xi) One Research Associate for a one-year term.
- xii) One representative from each of the Councils of the other Faculties of the University.
- xiii) One representative from the Department of Co-operative Education and Career Services.
- xiv) One representative from the Registrar's Office.
- xv) One representative from the Graduate Studies and Postdoctoral Affairs Office.
- xvi) One representative from the Library.

For Information**Open Session**

To: **Senate**

Sponsor: James Rush, Vice President Academic and Provost
provost@uwaterloo.ca

Presenters: Catherine Newell Kelly University Registrar
cnkelly@uwaterloo.ca

Clarence Woudsma
Interim Co- Associate Vice-President, Graduate Studies and
Postdoctoral Affairs
cwoudsma@uwaterloo.ca

Date of Meeting: **January 27, 2025**

Item Identification: **10.1 Undergraduate and Graduate Admissions
Update – Briefing Note**

Summary:

This brief provides undergraduate and graduate admissions data and supporting context and aims to support Senate’s awareness of the admissions funnel. The undergraduate data includes the 2020-2024 admissions funnel; the graduate data includes graduate student application and enrolment data for Fall 2024. A separate and early look at 2025 undergraduate applications is also provided.

This update is intended to provide Senate with an understanding of the trends in our applications, offers of admissions, and new admits—differentiated by undergraduate and graduate applicants, domestic and international applicants. There are some interpretations of the data included with the submitted briefing notes.

Members are encouraged to review the two related briefing notes (included as Appendices A and B). At the meeting of Senate, opportunity will be given to ask any additional questions.

Jurisdictional Information:

This report is submitted in support of Senate’s empowerments under section 22 of the *University of Waterloo Act, 1972*:

- (d) to determine standards of admission of students to the University;
- (j) to undertake, consider and co-ordinate long-range academic planning;

Governance Path:

Senate – 27 January 2025 (for information)
Board of Governors – 4 February 2025 (for information)

Documentation Provided:

- Appendix A: Undergraduate Admissions 2020-2024
- Appendix B: Graduate Student Application & Enrollment Data for Fall 2024

APPENDIX A: Undergraduate Admissions 2020-2024
Brief prepared for Senate 27 January 2025

This Brief provides an overview of Fall 2024 undergraduate admissions, along with comparative data from 2020-2023 and an early look at Fall 2025 application numbers. The recruitment and admissions funnel includes the number of applications, number of offers, number of confirmations, and count date registrations (Nov 1 enrolment, first year new admits) for each of the most recent five years. Data are divided into domestic and international numbers, as each cohort represents different targets and is assessed different levels of tuition.

FALL 2024 ADMISSIONS OBSERVATIONS

Domestic

Domestic applications and enrolment remained strong overall. Admissions criteria varied widely, from competitive-entry programs with capacity limits to those accepting minimum averages and offering to all eligible applicants. Many programs used minimum criteria to meet targets, while alternate offers were made for programs lacking qualified applicants.

Domestic applications, offers, confirmations, registrations 2020-2024

Domestic	2020	2021	2022	2023	2024
Applications ¹	37,086	42,300	50,086	49,933	50,787
Offers ¹	27,261	26,186	26,812	28,338	29,109
Confirmations ¹	6,746	6,581	6,449	6,214	6,221
Nov 1 Registered ²	6,333	6,123	6,058	6,087	5,988
Targets ³	5,558	5,532	5,594	5,617	5,733
% of Target	114%	111%	108%	108%	104%

International

This year was highly challenging for international recruitment and admissions in Canada. Strained relations with China and India—the largest sources of international students outside of Canada—slowed study permit processing times (notably in India) and tarnished Canada’s image as a welcoming destination. Additionally, the Federal government capped international student permits, requiring post-secondary institutions to issue a limited number of mandatory Personal Attestation Letters (PALs) for newly admitted international undergraduates from non-Canadian schools. A PAL became essential for these students to apply for study permits.

International applications, offers, confirmations, registrations 2020-2024

International	2020	2021	2022	2023	2024
Applications ¹	18,604	19,189	17,692	16,642	14,122
Offers ¹	8,839	7,500	8,361	8,280	7,071
Confirmations ¹	1,683	1,093	1,228	1,075	932
Nov 1 Registered ²	1,468	965	937	812	540
Targets ³	1,271	1,223	1,187	1,156	1,160
% of Target	115%	79%	79%	70%	47%

1. Applications, Offers, and Confirmations data sourced from [Registrar Resources Admissions Reports](#).
 2. November 1 Registered data source from IAP’s Year One Monitoring reports (Quest extracts). NOTE that the difference between Confirmations and Nov 1 Registered counts includes both attrition and the application of international tuition fee exemptions. International students who are paying domestic fees are not reflected in this data.
 3. Targets established by Provost and Faculty Deans.

The significant decrease in international numbers was influenced by several factors:

- In January 2024, a federal cap of 360,000 study permits (35% fewer than 2023) was announced, with ~292,000 for undergraduates. Ontario delayed institutional allocations until late March. New requirements included a Provincial Attestation Letter (PAL) for many international students, stricter work permit rules, and reduced Post-Graduate Work Permit eligibility. Waterloo responded by:
 - Introducing a \$1,000 tuition deposit for PAL-requiring students to reduce post-confirmation attrition.
 - Developing a “PAL Questionnaire” to clarify PAL requirements for students.
 - Making system updates to streamline PAL processing/distribution.
 - Expanding communications (e.g., website updates, emails, webinars, staff/faculty training).
- Despite these efforts, the announcements further eroded the Canadian PSE value proposition, signaling reduced welcome to international students and chilling recruitment/retention.
- The impact hit universities with significant international intake hardest: first-year international acceptances fell 14.7% across Ontario universities and confirmations dropped 25% at Waterloo (as of July 9).
- Additionally, over recent years, the number of dependent students applying as international applicants and receiving a tuition exemption to pay domestic fees grew significantly, contributing to a reduction of international fee-paying students (these students who received a tuition exemption are counted in domestic totals). We adjusted policies to stop accepting *Open* work permits for fee exemptions, reducing new exemptions to 70 in 2024 (from 120 in 2023). Financial constraints and visa delays contributed to summer attrition/melt.

International registered students attending school in Canada vs. outside Canada, Fall 2024

Source: Registrar’s Office, Admissions



We continue to see a large proportion (39%) of our international fee-paying student population coming from high schools within Canada.

International registered students, by country of last school attended and country of citizenship, Fall 2024

Last school attended (by country)	2023	2024	% chg
Canada	352	211	39%
China	117	89	16%
India	127	61	11%
UAE	42	31	6%
Saudi Arabia	5	22	4%
USA	14	15	3%
Indonesia	8	11	2%
Bangladesh	13	4	1%
Kenya	11	3	0.5%
Rest of world	123	93	17.5%
Total	812	540	100%

Citizenship	2023	2024	% chg
China	370	229	42%
India	196	111	21%
Korea	47	28	5%
Hong Kong	17	17	3%
Pakistan	17	15	3%
Indonesia	6	15	3%
Saudi Arabia	2	13	2%
Viet Nam	19	12	2%
Nigeria	15	7	1%
Rest of world	123	93	18%
Total	812	540	100%

Source: Registrar's Office, Admissions

FALL 2025 INCOMING UNDERGRADUATE CLASS: A LOOK FORWARD

What follows is an early look at the incoming applications for Fall 2025 admissions. This data is a snapshot in time (effective 15 Jan 2025) and we continue to receive applications through to January 31 (for most programs). Our campus partners have ongoing access to up-to-date data as the cycle progresses via the [Registrar Resources Admissions Reports](#).

Applications	2021	2022	2023	2024	2025 (as of Jan 15)	YOY (as of Jan 15)
Domestic	42,300	50,086	49,933	50,787	49,475	+3%
International	19,189	17,692	16,642	14,122	11,345	-8%

Note that Fall 2021-2024 numbers are final, from end of cycle; the Fall 2025 numbers are as of January 15, 2025, and will continue to grow until applications close. Most applications close January 31 though there will continue to be small additions through spring and summer.

Domestic – comparing our numbers today with the same date last year

- We have a 3% increase in Domestic applications to first-year compared with the same time last year. The majority of our increase is comprised of applicants who ranked Waterloo as their 1st, 2nd, or 3rd choice.
- Our collective work to recruit, admit, and better support self-identified Indigenous students is showing positive results. Indigenous undergraduate student enrolment (all years) has increased by 67%, from 135 to 236 students over the last five years.

International – comparing our numbers today with the same date last year

- International applications to first-year are down 8% overall compared to the same time last year. Our international applications are up 11% from international students attending Ontario schools and down 17% from those attending schools outside Ontario. Most of our decrease is comprised of those who ranked Waterloo as their 1st, 2nd, or 3rd choice.

Offers

- We have made 35% more offers of admission to domestic students and 8% fewer offers of admission to international students than at this time last year (January 15). The result is 30% more offers of admission overall following the first bulk round of offers to Fall 2025.

APPENDIX B: Graduate Student Application & Enrollment Data for Fall 2024
Brief prepared for Senate 27 January 2025

The following report summarizes the University's graduate student admissions data for fall 2024. For background, this report presents the data in a format that reflects the graduate student "admissions funnel". This is structured as follows. We report:

1. Total applications to the University.
2. The number of applicants who receive offers from the University.
3. The number of offers that are accepted by the applicants.
4. The number of students who accepted the offers that ultimately matriculated and were counted at Government count date.

The data are presented for the University as a whole, then disaggregated as follows:

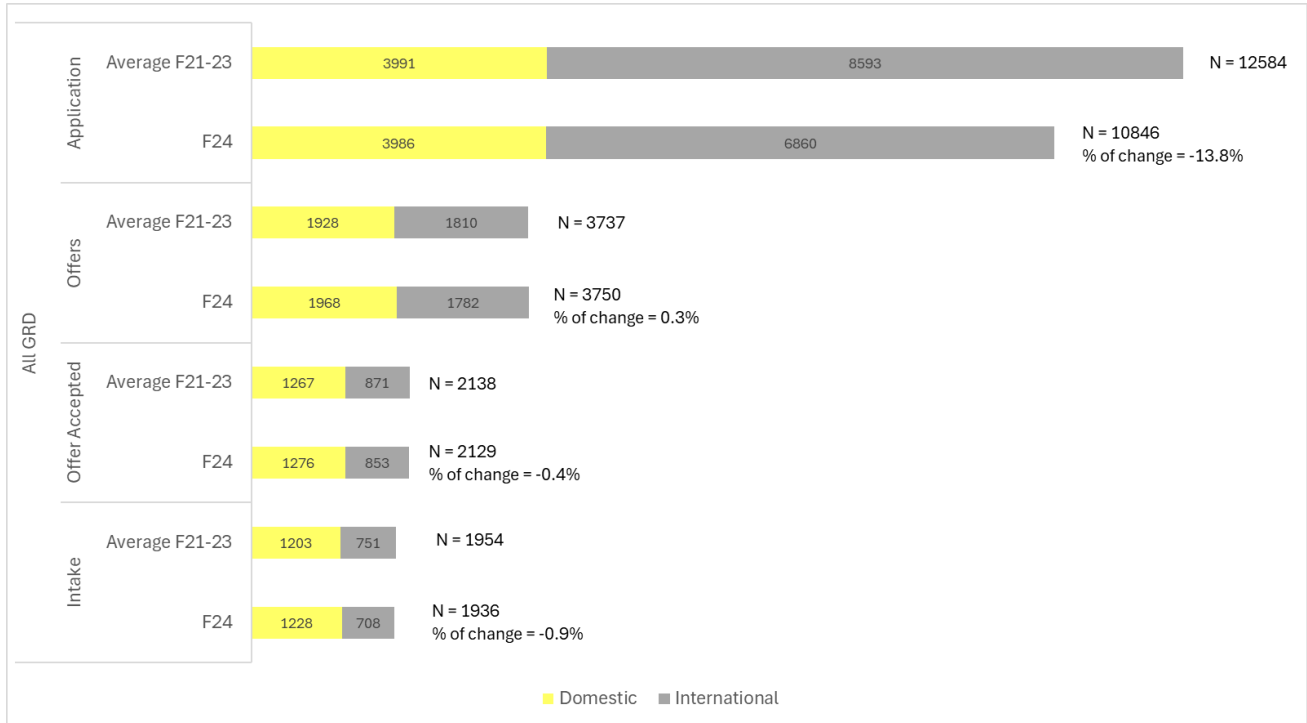
1. By international and domestic applicants.
2. By those applying to course-based master's programs, research master's programs, and PhD programs.

For comparative purposes, the fall 2024 data are presented with the average of the previous three years – fall 2021, 2022, and 2023. This comparison is motivated by the variance that is typical in graduate applications which makes year-over-year comparisons less valuable. It is worth noting that this particular comparative 3-year average marks the transition through the first full pandemic admission cycle of Fall 2021 to Fall 2023. Note also that many graduate programs allow admissions in each of the three terms. So, the Fall data are a subset of total applications / admissions – about 75%.

The summary is that the University saw a decrease in the size of its applicant pools across the majority of graduate program types, with significant declines in its international applicant pools for course-based masters, master's and Ph.D. programs while increased applications on domestic course based Masters a bright spot. Despite the smaller applicant pools, the overall number of offers made remained relatively constant, as did acceptances. That is, our admissions numbers for graduate students remains steady and the quality of our incoming students remains high.

In total, the intake for fall 2024 was roughly equivalent to the previous three years, with modest growth in PhD enrollments, offsetting marginal declines in course-based master's programs.

Aggregate fall 2024 graduate applications

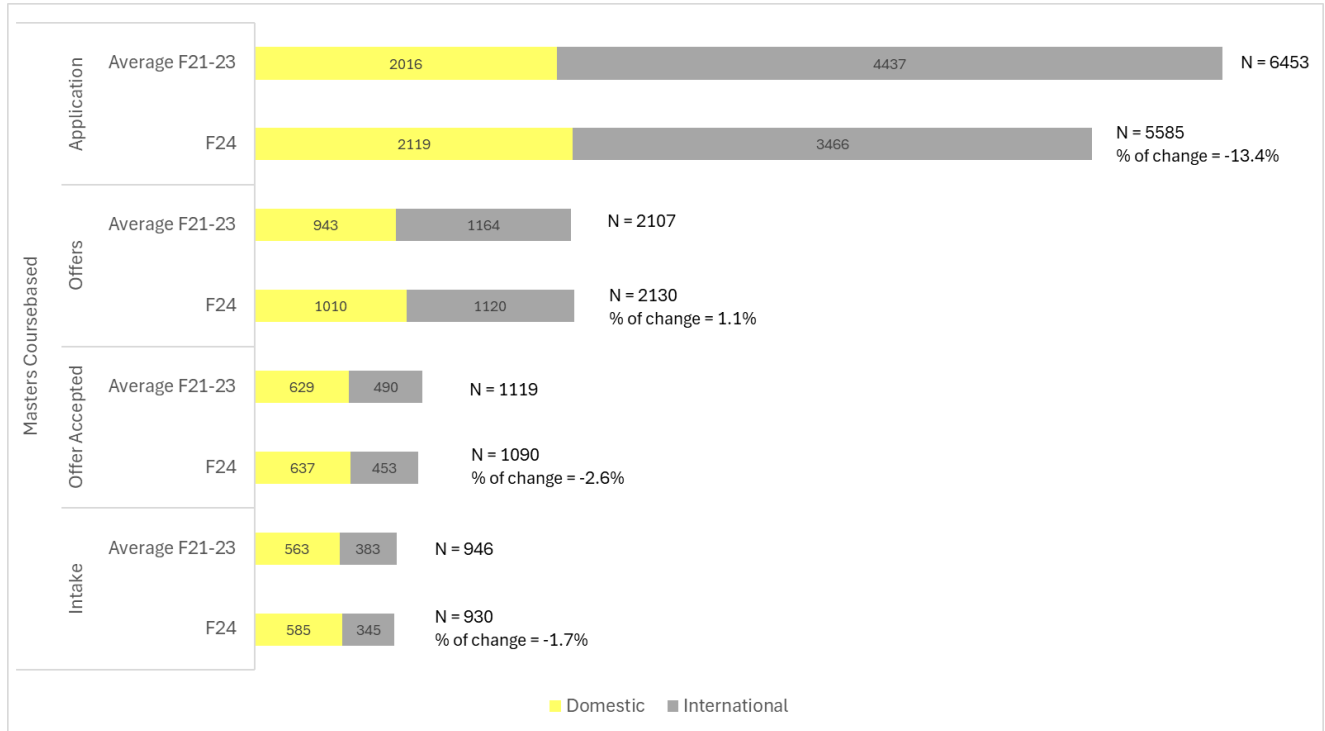


The graph shows the aggregate data for all graduate applications to the University in Fall 2024. In aggregate, the University saw declines in total applications, driven largely by declines in international applications. In sum, there were about 14% fewer applications to graduate programs in fall 2024 compared to the previous three years.

The university made nearly the same number of offers to highly qualified students in 2024 as the average over the previous three years. There were more domestic officers and a slight decline in international offers compared to the previous three years.

There were no substantive changes in the proportions of offers accepted while a 6% decrease in international intake was offset somewhat by a small percentage increase in domestic intake. In fall 2024, Waterloo welcomed 1,936 new graduate students with approximately 37% being international.

Fall 2024 applications to course-based Master's programs

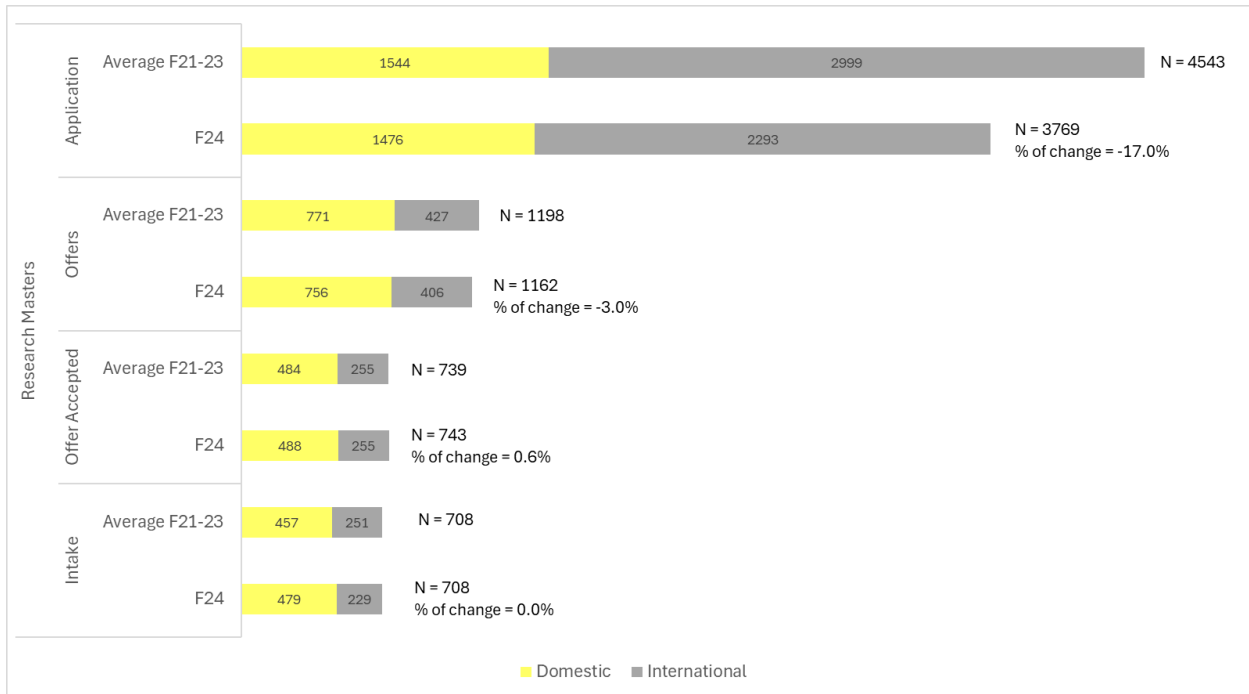


Fall 2024 generated about 13% fewer applications, with a decline predominantly in international applications (about 971 fewer). The University increased offers slightly beyond the three year average with a slight increase in domestic offers balanced against a decrease in international offers.

Of the offers made, 40% of international applicants accepted offers, whereas more than 63% of domestic applicants accepted offers. This difference in acceptance rates is consistent with previous years and is likely a result of the tuition differential for these two student cohorts. Of note, the domestic offer acceptance showed a decrease of 10% compared to the previous year.

The University's intake of new course-based master's students was 930, a slight decline from the previous three years. Attrition rates (measured as the proportion of accepted offers who do not matriculate) was 8.2% for domestic students and 24% for international students.

Fall 2024 applications to research Master's programs

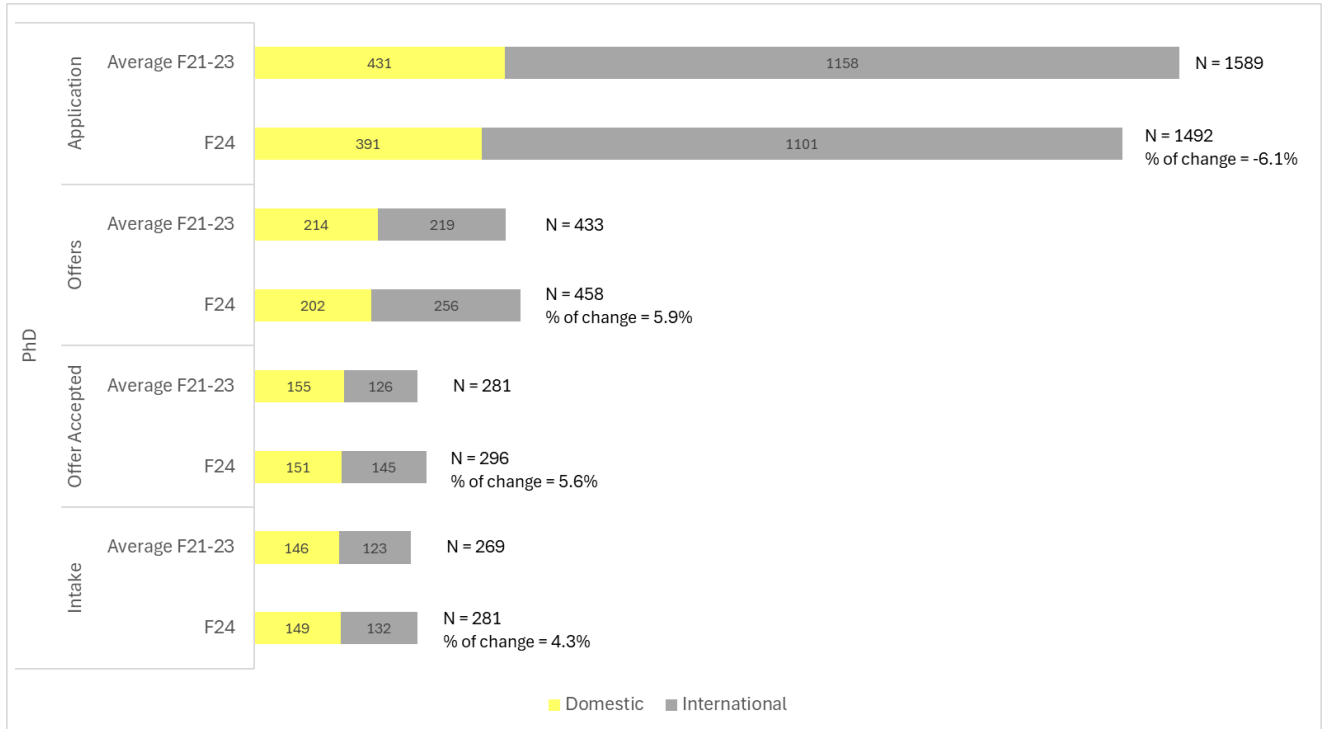


The University saw a large decline in applications for our research master's programs. In total, applications decreased by about 17%, with decreases in both domestic (4.4%) and international applications (24%). Domestic applications declined marginally compared to a 19% decline last year.

Supervisors and their departments made fewer offers (3% decline) to both domestic and international applicants with comparable levels of decline in both compared to the previous three-year average.

Offers were accepted and intake were roughly comparable to previous three years. The attrition rate for domestic students is 1.6% while 10.2% for international students. The university intake of research based master's students is stable compared to the three year average.

Fall 2024 PhD applications



The University continues to place a high value on PhD applications. For fall 2024, the ratio of international applicants to domestic applicants was 2.8:1, in line with the average of the previous years (2.7:1). Attracting strong domestic applicants to Waterloo’s graduate (PhD) programs remains a challenge.

Supervisors made offers to 458 applicants in F2024, a nearly 6% increase over the three year average. The offers made in F2024 continue exhibiting a slightly higher proportion to international students; offers to international students represent ~56% compared to the historic value of ~57%.

The number of PhD offers accepted increased in Fall 2024, resulting in modest gains with a (matriculated) student count of 281 (a 4.3 % increase over the three-year average). The attrition rates for PhD students are similar to that of research master’s students in both domestic and international cases.

Senate Agenda Items · expected *as needed	May 6, 2024	June 10, 2024	September 23, 2024	October 21, 2024	November 25, 2024	January 27, 2025	March 3, 2025	April 7, 2025
REGULAR AGENDA (including items for information and discussion)								
Minutes	·	·	·	·	·	·	·	·
Business Arising	·	·	·	·	·	·	·	·
LEADERSHIP UPDATES⁶								
Report of the Vice-President, Academic & Provost	*	*	*	*	*	*	*	*
Report of the Vice-President, Research and International	*	*	*	*	*	*	*	*
COMMITTEE/COUNCIL REPORTS								
Executive Committee	*	*	*	*	*	*	*	*
Graduate & Research Council (GRC)	·	·	·	·	·	·	·	·
Undergraduate Council (UC)	·	·	·	·	·	·	·	·
Long Range Planning Committee				·		·		·
Fall Update, University Operating Budget				·				
Joint Report of GRC & UC, Academic Calendar Dates ¹					·			
University Committee on Student Appeals Annual Report ¹ (Policy 72)					·			
University Appointment Review Committee Annual Report ¹ (Policy 76)								·
Finance Committee - Budget Update ³							·	
Finance Committee - Budget recommendation ^{2, 3}								·
OTHER SENATE AGENDA ITEMS								
New Senator Orientations (before meeting)	·							
Teaching Awards Committee, appointment of members							·	
Delegation of Roster of Graduands								·
Report of Roster of Graduands			·		·			
Convocation Report – summary of this years’ ceremonies					·			
Undergraduate and Graduate Admissions Update						·		
Conduct Self-Assessment Survey ¹							·	
Appointment of COU Academic Colleague	Current appointment runs to April 30, 2025							
SENATE PRESENTATIONS								
Presentations from the Presidents of the Faculty Association, Waterloo Undergraduate Association and Graduate Student Association ¹							·	
Strategic Plan Accountability Update ¹ (June)		·						
PART Annual Update		·						
Faculty/Unit Updates				SCI				

¹ Annual item

² Board of Governors approval

³ Presented by the Vice-President Academic and Provost

⁴ Presented by the President and Vice-Chancellor, and Chair of Senate

⁵ Presented by the University Secretary

⁶ Leadership updates may include such topics as: Talent, We Accelerate Report, Communities (EDI, Sustainability), Waterloo International, etc.

Senate Agenda Items								
• expected *as needed	May 6, 2024	June 10, 2024	September 23, 2024	October 21, 2024	November 25, 2024	January 27, 2025	March 3, 2025	April 7, 2025
CONSENT AGENDA								
Reports from Faculties (e.g., appointments, administrative appointments, sabbaticals) ²	•	•	•	•	•	•	•	•
Tenure and Promotion Report ⁴			•					
University Professor Designation ³								•
Call for Nominations for University Professor ³			•					
Call for Nominations for Honorary Degree Recipients ⁴								•
Report of the COU Academic Colleague ¹								•
Senate Committee Appointments ⁵	*	*	•	*	*	*	*	*
CLOSED AGENDA								
Minutes	•	•	•	•	•	•	•	•
Business Arising	•	•	•	•	•	•	•	•
Reports from Committees and Councils	*	*	*	*	*	*	*	*
Honorary Degree Recommendations	*	*	*	*	•	•	*	*
Reports from Search and Review Committees for Policy-based Senior Leadership Appointments and Reappointments	*	*	*	*	*	*	*	*
Report of VP Advancement on Policy 7 ¹		•						

Special Topics for 2024-2025 to be Scheduled:

- President’s Anti-racism Task Force Update (PART)

For more information: secretariat@uwaterloo.ca
uwaterloo.ca/secretariat, NH 3060

¹ Annual item

² Board of Governors approval

³ Presented by the Vice-President Academic and Provost

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Senate Graduate and Research Council

For Approval

Open Session

To: **Senate**

**Sponsors and
Presenter(s):**

Charmaine Dean
Vice-President, Research & International

Clarence Woudsma
Interim Co-Associate Vice-President, Graduate Studies and
Postdoctoral Affairs

Date of Meeting: January 27, 2025

Agenda Item: **11.2.1 Senate Graduate and Research Council: Graduate
Studies Academic Calendar Changes**

Recommendation/Motion

Motion: That Senate approve the following Graduate Studies Academic Calendar changes, effective 1 January 2025, as presented.

Summary

[Senate Graduate and Research Council](#) met on November 18, 2024 and agreed to forward the following items to Senate for approval as part of the consent agenda.

Items for approval:

- 1) International Visiting Graduate Student (IVGS) program
- 2) Dual PhD degrees (Cotutelle agreements)
- 3) Graduate Certificate of Participation
- 4) Collaborative programs
- 5) Student accommodations and accessibility supports

Description and rationale for proposed changes:

The process of reviewing and renewing the GSAC began in the Fall 2023 term, with a number of sections coming forward to SGRC/Senate. This work continues, with the intent of reviewing all "Regulations" sections within the GSAC.

As described in Fall 2023, like many University of Waterloo governance documents, the GSAC has evolved over time. Despite the regular modifications to the GSAC, and its importance, the GSAC has not been holistically reviewed or updated for some time.

Increasingly students, and administrators are relying on the GSAC, and so the re-write is intended to present the GSAC elements in language that is accessible to both audiences.

This work has been done collaboratively and in partnership with the Faculties and other Academic Support Units that have expertise in the content (e.g., AccessAbility Services, Academic Quality Enhancement). The proposed changes have been reviewed and endorsed by the Graduate Operations Committee.

Proposed effective date: Term: Winter Year: 2025

Current Graduate Studies Academic Calendar (GSAC) page:

<https://uwaterloo.ca/academic-calendar/graduate-studies/catalog#/policies>

Jurisdictional Information

This item is being submitted to Senate in accordance with [Senate Bylaw 2, section 4.03\(a\)](#): "Make recommendations to Senate with respect to the governance, direction and management of, or any changes in rules, regulations or policies for graduate studies and research in the university."

Governance Path

Senate Graduate and Research Council approval date (mm/dd/yy): 11/18/24

Documentation Provided

Appendix A: Proposed Changes

Appendix A: Proposed Changes

1) International Visiting Graduate Student (IVGS) program

IVGS information is being added to the GSAC as it has historically only appeared on the GSPA website. The GSPA website will continue to include procedural materials and the GSAC will contain regulatory information.

Current Calendar copy	Proposed Calendar copy
<p>No equivalent section</p>	<p><u>12.4 International Visiting Graduate Student (IVGS) Program</u></p> <p><u>Graduate students from around the world are welcome to enhance their research opportunities at the University of Waterloo, by participating in the International Visiting Graduate Student (IVGS) program.</u></p> <p><u>The IVGS program allows graduate students enrolled in research-based programs at non-Canadian universities to undertake research at the University of Waterloo under the supervision or co-supervision of a University of Waterloo faculty member.</u></p> <p><u>Under the IVGS program, students from universities approved by the University of Waterloo may come to the University of Waterloo in the absence of a formal institution-to-institution exchange agreement. Internationally registered students benefit from the expertise, resources, and facilities offered at the University of Waterloo, while enriching the intellectual community of the host department.</u></p> <p><u>In pursuit of an IVGS placement, a proposed agreement is endorsed by the student's supervisor and department at the student's home university. The proposed agreement is then endorsed by the intended University of Waterloo supervisor and department Chair/school Director. Approvals for IVGS are granted by the Associate Vice-President Graduate Studies and Postdoctoral Affairs.</u></p> <p><u>Students in the IVGS program are not permitted to enrol in courses for credit but, with permission from their graduate unit and the course instructor, IVGS program students may be allowed to informally audit classes.</u></p>

	<p>The IVGS program is open to students who:</p> <ol style="list-style-type: none"> 1. <u>are currently enrolled in a graduate degree program at a non-Canadian institution;</u> 2. <u>remain an active graduate student at their home university during the duration of their research engagement at the University of Waterloo (i.e., have not officially completed their degree);</u> 3. <u>hold a valid Canadian work permit (where applicable) during the duration of their IVGS experience. Note, during the approval process appropriate documentation and support will be provided to obtain the necessary immigration status.</u> <p><u>Exceptions to requirement 2 may be considered in extraordinary cases. Consult with the Associate Director, Graduate Admissions.</u></p> <p><u>Students participating in the IVGS program do not pay academic tuition to the University of Waterloo but are required to pay the insurance premiums in the University Health Insurance Plan (UHIP) if they do not hold Canadian health insurance.</u></p> <p><u>For eligibility requirements, application process and further details, please refer to the Graduate Studies and Postdoctoral Affairs website.</u></p>
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2) Dual PhD degrees (Cotutelle agreements)

Dual PhD degrees (Cotutelle agreements) information is being added to the GSAC as it has historically only appeared on the GSPA website. The GSPA website will continue to include procedural materials and the GSAC will contain regulatory information.

Current Calendar copy	Proposed Calendar copy
No equivalent section	<p><u>12.5 Dual PhD degrees (Cotutelle agreements)</u></p> <p><u>Cotutelles (a French term for “joint enrolment”) can be sought as academic opportunities for PhD students in instances where research relationships between the</u></p>

University of Waterloo and the partner institution can be advanced through the student's engagement with both institutions, to the betterment of the student and their areas of research.

PhD students studying under a cotutelle agreement are concurrently enrolled at the University of Waterloo and an approved non-Canadian partner university.

The Associate Vice-President Graduate Studies and Postdoctoral Affairs (GSPA) is the approving authority for any proposed cotutelle agreements. For further information on establishing a cotutelle agreement, refer to the [Dual degrees program agreements \(Cotutelle\)](#).

A cotutelle agreement has the following requirements:

Co-supervision: the PhD student's training and research activities are supervised by qualified faculty members at the University of Waterloo and at the partner institution.

Distinct degree requirements: students, with their academic supervisors, compose a customized program for the individual student that when successfully completed, will be deemed to have fulfilled all requirements for the degree at both institutions. Elements normally to be considered in the individual program include required coursework, residency, comprehensive examinations, and milestones.

Enrolment and research plan: the time spent on doctoral studies at each university is to be balanced as equally as possible; the mobility schedule is jointly planned by the two supervisors. The University of Waterloo's residency requirements must be satisfied for students in cotutelle agreements.

Funding: the University of Waterloo's [minimum funding requirements](#) must be satisfied for cotutelle students in the terms in which they are in residence (i.e., assessed tuition and fees) at Waterloo.

	<p>PhD thesis defence: the PhD candidate normally satisfies the requirements for the PhD thesis defense concurrently, through a single process, for both the University of Waterloo and the partner institution. The process is administered at a location and in a language specified in the cotutelle agreement. The composition of the examination committee must satisfy the University of Waterloo's PhD examining committee requirements. In practice, the examining committee is normally equally balanced with representation from the University of Waterloo and the partner institution.</p> <p>Outcomes: students successfully completing a cotutelle agreement receive two PhD diplomas, one from the University of Waterloo and one from the partner institution; the diplomas indicate that the degrees are awarded through a cotutelle.</p>
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3) Graduate Certificate of Participation

Graduate Certificate of Participation information is being reinstated in conjunction with recent GSAC changes to section 11.1 Graduate Certificates in Spring 2024. This provides a transitional option for current unit efforts to recognize engagement with non-degree activities.

Current Calendar copy	Proposed Calendar copy
<p>No current equivalent section (note: the following content appeared in the Winter 2024 GSAC)</p> <p>Graduate Certificate of Participation/Completion</p> <p>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.</p> <p>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</p>	<p><u>11.2</u> Graduate Certificate of Participation</p> <p><u>In contrast to the Graduate Certificates as identified in section 11.1</u>, a Graduate Certificate of Participation 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 is not recorded on the official University record and academic transcript.</p> <p>Proposals for Graduate Certificates of Participation require Department and Faculty approval and are normally completed in conjunction with a master's or doctoral program, or non-degree graduate enrolment. All <u>Graduate</u> Certificates of Participation approved by a Department and Faculty must be reported to SGRC for information.</p>

enrolment. All Certificates of Participation/Completion approved by a Department and Faculty must be reported to SGRC for information.	
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4) Collaborative programs

Collaborative program requirements are being added to the GSAC to reflect our development of collaborative programs and to align with the Ontario Universities Council on Quality Assurance definition.

Current Calendar copy	Proposed Calendar copy
<p>No equivalent section</p>	<p><u>9.2 Collaborative programs</u></p> <p><u>The University of Waterloo strongly endorses interdisciplinary academic programs that advance novel curricula and research opportunities. To this end, the University supports the development of Collaborative Programs where students obtain disciplinary expertise in their primary program with specific application to the collaborative theme.</u></p> <p><u>In addition to generating diverse learning outcomes, these collaborative programs are structured to promote communities of scholars – students, faculty members, and external partners – in the thematic area of the collaborative program.</u></p> <p><u>The requirements for collaborative programs differ by academic program structure/study option:</u> <u>For research collaborative programs:</u></p> <ol style="list-style-type: none"> 1. <u>Prospective students apply to the collaborative program. Applications will be assessed both in terms of the admission requirements for the primary program and the applicant’s potential for successful completion of the collaborative elements of the program.</u> 2. <u>As with all graduate research programs, admission to collaborative programs is dependent on the availability of an appropriate supervisor (or supervisors) and funding, as appropriate.</u> 3. <u>Course requirements must include the required courses in the student’s</u>

primary program and the required courses from the collaborative program. The required collaborative courses cannot be required courses in the primary program and must be foundational to the collaborative theme. Normally, not fewer than two (0.5 unit weight) courses will be required from the primary program and not fewer than two (0.5 unit weight) courses will be required for the collaborative program – four (0.5 unit weight) courses in total. Additional required courses may be included.

4. Student's research, conducted to satisfy collaborative program requirements, must demonstrate the application of skills and knowledge from the primary program to the theme of the collaborative program. The student's examining committee shall consider this requirement when evaluating a student's Master's Research Paper, Master's Thesis or Doctoral Dissertation.

For course-based, collaborative Master's programs:

1. Prospective students apply to the collaborative program. Applications will be assessed both in terms of the admission requirements for the primary program and the applicant's potential for successful completion of the collaborative elements of the program.
2. Course requirements must include the required courses in the student's primary program and the required courses from the collaborative program. The required collaborative courses cannot be required courses in the primary program and must be foundational to the collaborative theme. Normally, not less than half the total courses will be required from the primary program, and not less than four (0.5 unit weight) courses will be required for the collaborative program. A concluding, capstone course can be included and will satisfy

	<p><u>one of the four collaborative course requirements.</u></p> <p><u>For all collaborative programs, the University requires the creation of an oversight committee that will be responsible for regular monitoring of the program, with specific focus on those elements included in the University's Institutional Quality Assurance Framework.</u></p> <p><u>Collaborative programs should normally be associated with primary programs from at least two Faculties, with more Faculties' engagement being preferred.</u></p> <p><u>Note: graduate research fields or graduate specializations associated with participating programs are not applicable to collaborative programs.</u></p> <p><u>Approval process</u> <u>All new collaborative programs require Department/School, Faculty, Senate Graduate and Research Council (SGRC) and Senate approval. Further details regarding the approval process are available on the Academic Quality Enhancement website.</u></p>
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5) Student accommodations and accessibility supports

Student accommodations and accessibility supports information is being added to the GSAC to reflect current practice at the institution (i.e. Undergraduate Studies Academic Calendar) and our adherence to statutory requirements and to align with the Student Academic Accommodation Guidelines.

Current Calendar copy	Proposed Calendar copy
<p>No equivalent sections</p>	<p><u>15.1 Academic accommodations for students with disabilities</u></p> <p><u>The University of Waterloo is committed to upholding the rights of persons with disabilities and creating accessible and inclusive learning environments for all. In this context, the term 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, mental health disabilities, disabling medical conditions, and the physical, emotional, and</u></p>

psychological effects of a trauma (e.g., sexual violence). Program administrators, instructors and supervisors work with [AccessAbility Services](#) to ensure students have equitable access to their education, and receive reasonable academic accommodations that provide the opportunity to meet the academic standards of their program.

The [Student Academic Accommodation Guidelines](#) support the staff and faculty of the University of Waterloo in understanding their roles and responsibilities in the academic accommodation process. Students are encouraged to register with [AccessAbility Services](#) as early as possible to make the nature of their disability and/or needs known. Students can complete [AccessAbility Services' online application](#). [AccessAbility Services](#) is available to assist with completing the application upon request.

15.2 Funding and support for students with disabilities

Students who are on reduced academic load as a stipulation of verified accommodation through [AccessAbility Services](#) will have equal opportunity for services (such as access to on-campus housing), awards and scholarships that are normally only available to students with full-time enrolment status.

In most instances, a reduced academic load will result in registration under the graduate [part-time definition](#), with tuition rates consistent with this level of progression.

Research students are generally supported through a blend of funding commitments including scholarships/awards and employment opportunities through Graduate Teaching Assistantships and Graduate Research Assistantship positions. Students who are on a reduced workload accommodated through [AccessAbility Services](#) will work out a funding plan with their supervisor, department/school, Faculty and GSPA, with support from [AccessAbility Services](#) advisors.

<p>1.1 Religious holidays/examination scheduling</p> <p>The University acknowledges that, due to the pluralistic nature of the University community, some students may on religious grounds require alternative times to write examinations and tests. Accordingly, a student who requires an alternative examination or test time on religious grounds should consult with the Associate Dean of the Faculty offering the course regarding alternative arrangements. Such a request should be made within one week of the announcement of the test or examination date. For students in courses taught at the Federated University or affiliated Colleges, the responsibilities of the Associate Dean in these procedures are exercised by the Dean of the Federated University or affiliated Colleges (or Head in cases where there is no Dean).</p>	<p><u>15.3 Academic accommodations for creed/religion</u></p> <p>The University acknowledges that, due to the pluralistic nature of the University community, some students may <u>seek academic accommodations on</u> religious grounds.</p> <p><u>For accommodation of course work expectations, 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 date for which academic accommodation is being sought.</u></p> <p><u>For accommodations of scheduled milestones/non-course degree requirements, students should inform their department/school graduate officer/coordinator at least two weeks in advance.</u></p>
<p>No equivalent section</p>	<p><u>15.4 Academic accommodations for other code grounds</u></p> <p><u>Students seeking academic accommodations related to a protected ground (e.g., family status which would encompass pregnancy and breastfeeding, and gender), per Ontario Human Rights Code, should inform their instructor/department/school graduate officer/coordinator as soon as they become aware of the need.</u></p>

Senate Graduate and Research Council

For Information

Open Session

To: Senate

Sponsors and Presenters: Charmaine Dean
Vice-President, Research & International
Clarence Woudsma
Interim Co-Associate Vice-President, Graduate Studies and
Postdoctoral Affairs

Date of Meeting: January 27, 2025

Agenda Item: 11.2.2 **Senate Graduate and Research Council: Report for Information**

Summary

[Senate Graduate & Research Council](#) met on November 18, 2024 and agreed to forward the following items to Senate for information as part of the consent agenda. On behalf of Senate, the following items were approved:

1. Graduate Awards

Council approved the following [graduate awards](#):

- 1.1 Cornfield PhD Fellowship in Sustainable Energy Systems – trust
- 1.2 Wefers Bettink Family Graduate Scholarship – endowment
- 1.3 Severin Hacker PhD Fellowship in Amblyopia Research – trust
- 1.4 Statistics and Actuarial Science Graduate Entrance Award – operating
- 1.5 Civil and Environmental Engineering Graduate Award – operating
- 1.6 Tikkun Olam Award – trust
- 1.7 Innovation in Psychology Graduate Scholarship – trust
- 1.8 Major Graduate Award for Innovation in Engineering – trust
- 1.9 Major Graduate Award for Innovation in Science - trust

Council received for information the following graduate award:

- 1.10 Statistics and Actuarial Science Chair’s Graduate Award – operating

2. Graduate Studies Academic Calendar Changes

Council received for information the following [graduate studies academic calendar changes](#):

- 2.1 Canadian Universities Graduate Transfer Agreement (CUGTA)
- 2.2 Non-degree admission

2.3 Graduate research fields

3. Curricular Submissions

Council approved new courses, course changes, and minor modifications for:

- 3.1 [Faculty of Engineering](#)
- 3.2 [Faculty of Environment](#)
- 3.3 [Faculty of Science](#)
- 3.4 [Faculty of Math](#)

Jurisdictional Information

As provided for in [Senate Bylaw 2, section 4.03](#), council is empowered to make approvals on behalf of Senate for a variety of operational matters:

- f. On behalf of Senate, consider and approve all new graduate courses, the deletion of graduate courses, and proposed minor changes to existing graduate courses and programs, and provide Senate with a brief summary of council's deliberations in this regard. Any matter of controversy that might arise may be referred to Senate.
- i. On behalf of Senate, consider and approve all new graduate scholarships and awards. Any matter of controversy that might arise may be referred to Senate.

Senate Undergraduate Council

For Information

Open Session

To: Senate

Sponsor and Presenter: David DeVidi
Associate Vice-President, Academic

Date of Meeting: January 27, 2025

Agenda Item: **11.3 Senate Undergraduate Council: Report for Information**

Summary

[Senate Undergraduate Council](#) met on November 19, 2024 and agreed to forward the following items to Senate for information as part of the consent agenda. On behalf of Senate, the following items were approved:

1. Curricular Submissions

Council approved new courses, course changes, and minor modifications for:

1.1 [Faculty of Mathematics](#)

Council approved changes to the Assessments: Academic Considerations and Accommodations

1.2 [Registrar's Office](#)

Council received the following presentations for information: Undergraduate Awards Report, New Undergraduate Process to Create a Subject Code, Credentials Framework Report and Overview, English Language Proficiency Requirements, Freedom of Expression and Inclusive Engagement Taskforce Report

Jurisdictional Information

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

- b. On behalf of Senate, consider and approve all new undergraduate courses, the deletion of undergraduate courses, and proposed changes to existing undergraduate courses and minor changes to programs and/or plans, and provide Senate with a summary of council's deliberations in this regard. Any matter of controversy that might arise may be referred to Senate.

For Information**Open Session****To:** Senate**Sponsor:** James W.E. Rush, Vice-President, Academic and Provost
Contact Information: provost@uwaterloo.ca**Presenter:** James W.E. Rush, Vice-President, Academic and Provost
Contact Information: provost@uwaterloo.ca**Date of Meeting:** January 27, 2025**Agenda Item Identification:** 11.4 Report from Senate Long Range Planning Committee**Summary:**

A summary of the item discussed at the Senate Long Range Planning Committee on November 13, 2024 is provided for the information of Senate.

1. Update on University of Waterloo Campus Plan

The University aims to develop a student-centered, forward-looking campus plan reflecting Indigeneity, innovation, and community integration. Guided by a steering committee and consultants, the plan will address teaching, research, space use, and institutional history, with a clear implementation strategy and broad community engagement to support accessibility, branding, and future vision alignment.

2. Cross-Institutional and Multidisciplinary Initiatives—Briefing and Discussion

The committee received presentations which showcased collaboration across departments, schools and Faculties to bring innovative opportunities in teaching and research, along with driving potential new advancement opportunities, and creating avenues for supporting and informing government policy. The initiatives have taken specific efforts to align their focus with the five Global Futures enunciated in Waterloo at 100.

- Cross-Faculty Master's Co-Supervision Initiative in Data and Computation
 - o Supports interdisciplinary research collaboration across all Faculties, funding up to 15 fellowships annually
 - o Successes include the Math+X Inter-Faculty Research Workshop on data and computation for the five Global Futures. Challenges include international applicant numbers, and internal and external advertising will be important
- Collaborative Master's Program in Health Technologies
 - o Collaboration involves leveraging faculty supervision and courses across multiple Faculties
 - o Programming includes new MAsc and PhD programs in biomedical engineering, a health technologies master's program (expected Spring 2025), and pathways for physician-entrepreneurs in the MBET program.
 - o Focus on fostering interdisciplinary collaboration to enhance program offerings and attract diverse student talent.

3. Consideration of Restructuring of Senate Long Range Planning Committee

The committee considered the potential restructuring of this committee along with Senate Finance Committee to improve institutional coordination and reduce resource requirements by streamlining processes and addressing information asymmetry between finance and long-term planning topics. Such changes would align with structures seen at U15 comparators and would align with modern institutional needs, especially integrated budget planning. The committee will continue exploration of this option at the next meeting, and this item of business will also come forward to an upcoming meeting of Senate Finance Committee.

For Discussion

Open Session

To: Senate**Sponsor:** Charmaine B. Dean, Vice President Research and
Contact Information: International
vpri@uwaterloo.ca**Presenter:** Charmaine B. Dean, Vice President Research and
Contact Information: International
vpri@uwaterloo.ca**Date of Meeting:** January 27, 2025**Agenda Item Identification:** 11.5.1 Awards, Distinctions, Grants, Waterloo International Engagements**Summary:**

Presenting the Vice-President, Research and International January 2025 Report to Senate. This report to Senate highlights key research, international and entrepreneurial outputs and outcomes for October and November 2024.

Documentation Provided:

- Vice-President, Research and International January 2025 Report to Senate

Vice-President, Research & International Report to Senate January 2025

Introduction

This report to Senate highlights successful commercialization, research and international outputs and outcomes for the period October and November 2024.

Commercialization and Entrepreneurship Highlights:

[Global Consortium of Entrepreneurship Centers Highly Commended for Outstanding Contributions to Venture Creation](#)

In November 2024, Velocity was awarded '*Highly Commended for Outstanding Contributions to Venture Creation*' at the Global Consortium of Entrepreneurship Centers annual conference in Boston. The Highly Commended Designation recognizes schools that have demonstrated excellence and innovation, standing out for their impactful contributions, just short of the top spot.

"The Outstanding Contributions to Venture Creation award" honors centers that support the process of launching and accelerating university affiliated startups through competitions, incubators, accelerators, or other programs. Universities who excelled in this category showed concrete evidence of venture acceleration over time and the cultivation of startup founders. These awardees are making an incredible impact in their startup ecosystems, and we are excited to recognize their achievements.

Velocity Cornerstone Program

The Velocity Cornerstone program is the culmination of the student entrepreneurial process. It is a community of student founders all looking to start their careers in entrepreneurship. During October and November, the largest cohort of student led start-ups (100+ Waterloo student founded teams) participated in the 10-day program to validate their ideas and turn them into viable ventures by capturing real-world customer discovery and validation.

Velocity Femtech Challenge

In collaboration with Femtech Canada and Hyivy Health, the Velocity FemTech Innovation Challenge took place and over a two week period, more than 100 University of Waterloo students formed teams to tackle some of the most critical issues in women's health. The challenge spurred student teams to address underfunded areas in women's health—particularly menopause, gynecological health, and childbirth.

The winning team, **PeriGuard** (founded by Clara Kim, Sean D’Mello, Erica Liu, and Emily Rose – current Waterloo Biomedical Engineering students), presented an innovative device to support women during childbirth, offering a safe, reusable way to prevent perineal tearing through controlled heat application. Their work highlights how forward-thinking design can alleviate common birthing challenges. The grand prize was \$4,000.

Funded Research Awards:

Canada Research Chairs

Nine researchers at the University of Waterloo have been awarded \$7.5M in funding to support their research as part of the Canada Research Chairs (CRC) program. The following CRCs have been either awarded or renewed with start dates between May 2024 to Nov 2024.

New Canada Research Chairs

Juewen Liu (Chemistry) - Tier 1 NSERC

Title: Biosensors and Bionanotechnology

Amount: \$1,400,000

Rebecca Saari (Civil and Environmental Engineering) - Tier 2 NSERC

Title: Global Change, Atmosphere, and Health

Amount: \$500,000 + \$100,000 Federal Research Fund

Minna Tahmasbi (Cheriton School of Computer Science) - Tier 2 NSERC

Title: Minimizing Human Error in Operating Modern Networks

Amount: \$500,000 + \$100,000 Federal Research Fund

Mihaela Vlasea (Mechanical and Mechatronic Engineering) - Tier 2 NSERC

Title: Sustainable Additive Manufacturing

Amount: \$500,000 + \$100,000 Federal Research Fund

Renewed Canada Research Chairs

Christine Dow (Geography and Environmental Management) - Tier 2 NSERC

Title: Glacier Hydrology and Ice Dynamics

Amount: \$500,000

Juan Moreno-Cruz (School of Environment, Enterprise and Development) – Tier 2 SSHRC

Title: Energy Transitions

Amount: \$500,000

Pierre-Nicholas Roy (Chemistry) - Tier 1 NSERC

Title: Quantum Molecular Dynamics

Amount: \$1,400,000

Nicole Nicolette (French Studies) - Tier 2 SSHRC

Title: Études des minorités

Amount: \$500,000

**Ehsan Toyserkani (Mechanical and Mechatronics Engineering)-
Tier 1 NSERC**

Title: Intelligent Multi-Scale Additive Manufacturing

Amount: \$1,400,000

ORF- Small Infrastructure Fund (SIF)

The Ontario Research Fund – Research Infrastructure provides research institutions with funding to help support infrastructure needs, such as modern facilities and equipment. Both the Ontario government and the Canada Foundation for Innovation provide funding. Waterloo researchers received \$2M across 15 ORF-SIF projects this past fall.

Khuzaima Daudjee (School of Computer Science)

Title: Scalable Infrastructure for Data-Intensive Systems

Amount: \$220,000

Kyle Daun (Mechanical and Mechatronics Engineering)

Title: Hyperspectral imaging for quantifying methane from anthropogenic and natural sources

Amount: \$300,000

Tonya Del Sontro (Earth and Environmental Sciences)

Title: Resolving Ecosystem Scale Greenhouse Gas Dynamics of Human-Impacted Freshwaters

Amount: \$100,000

Kaylena Ehgoetz Martez (Kinesiology and Health Sciences)

Title: Can Gait Identify and Predict Brain Health

Amount: \$100,000

Yue Hu (Mechanical and Mechatronics Engineering)

Title: Dual-arm mobile manipulation: human-centred interaction for human spaces

Amount: \$100,000

Aukosh Jagannath (Statistics and Actuarial Science)

Title: Mathematical Foundations of Data Science

Amount: \$80,000

Milad Kamkar (Chemical Engineering)

Title: Engineering Multifunctional All-liquid Soft Materials and Ultra-light Weight Aerogels

Amount: \$80,000

Nikolas Knowles (Kinesiology and Health Sciences)

Title: Development of a Comprehensive Laboratory for Evaluation of Tissue Mechanics

Amount: \$100,000

Tianyuan Li (Civil and Environmental Engineering)

Title: An indoor air quality and occupant exposure testing and monitoring laboratory

Amount: \$100,000

Alana Lund (Civil and Environmental Engineering)

Title: Uncertainty-Aware Structural Identification Testbed for Bridge Infrastructure

Amount: \$110,000

Veronika Magdanz (Systems Design Engineering)

Title: Imaging system for the development of medical microrobots

Amount: \$80,000

Chantel Markle-Perricc (Geography and Environmental Management)

Title: Conservation and Management Strategies to Biodiversity Loss in an Era of Global Change

Amount: \$76,000

Cosmin Munteanu (Systems Design Engineering)

Title: Emerging Natural Interactive Technologies to Support Older Adults' Social Connections and Digital Inclusion

Amount: \$80,000

German Sciaini (Chemistry)

Title: A transmission electron microscope optimized for the visualization of unstained biological specimens

Amount: \$451,157

Ruodu Wang (Statistics and Actuarial Science)

Title: Quantitative Risk Management Lab

Amount: \$80,000

Ontario Research Fund - Research Excellence (ORF-RE)

The Ontario Research Fund – Research Excellence (ORF–RE) provides research institutions with funding to support the operational costs of major projects of strategic value to the province. Waterloo researchers received \$6.4M across 5 projects.

Slim Boumaiza (Electrical and Computer Engineering)

Title: Radio Technologies for Unleashing the Commercial Potential of 6G Mid-Band Communication Systems
Amount: \$2,000,000

Raouf Boutaba (School of Computer Science)

Title: Designing the Next-G Platform for Future 5G and Beyond Applications
Amount: \$2,000,000

Cecile Devaud (Mechanical and Mechatronics Engineering)

Title: Hydrogen as a sustainable Aviation Fuel - Combustion Research to Remove Impediments to Adoption in Gas Turbine Engines
Amount: \$373,800

Kaan Erkorkmaz (Mechanical and Mechatronics Engineering)

Title: Prescriptive Maintenance Technology as a Competitive Advantage for Ontario's Advanced Manufacturing Industry
Amount: \$112,000

Ehsan Toyserkani (Mechanical and Mechatronics Engineering)

Title: Manufacturing processes and technologies
Amount: \$2,000,000

CIHR Strategic Operating

The CIHR Strategic Operating grants are designed to fund researchers working in priority areas identified by CIHR, for example, to fill a gap or respond to an emerging health issue.

Kelly Skinner (School of Public Health Sciences)

Title: Mobilizing opportunities to strengthen gestational diabetes prevention and management in the ISR, NWT using a public health approach
Amount: \$124,609

NSERC Alliance International Catalyst

NSERC Alliance International Catalyst grants support collaborations between Canadian University researchers and international university researchers. Waterloo received \$50,000 over 2 grants in this period.

Hamed Shahsavan (Chemical Engineering)

Title: High Throughput Fabrication of Microrobots using Digital Micromirror Device Photolithography Combined with Microfluidics
Amount: \$25,000

Michael Tam (Chemical Engineering)

Title: Sustainable nutrient and pesticide delivery systems to support agriculture practices towards a net-zero economy
Amount: \$25,000

SSHRC Open Research Area

The SSHRC Open Research Area call was created to strengthen international cooperation in social sciences by funding high-quality scientific research projects. The call supports the participation of Canadian researchers from all disciplines of the social sciences and humanities.

Samuel Johnson (Psychology)

Title: The Uncertain Future and the Affective Imagination
Amount: \$411,748

SSHRC Trans-Atlantic Platform

The Trans-Atlantic Platform for Social Sciences and Humanities (T-AP) is an unprecedented collaboration between humanities and social science research funders from South America, North America, Europe and Africa. T-AP aims to enhance the ability of funders, research organizations and researchers to engage in transnational dialogue and collaboration.

Daniel Gorman (History)

Title: Global Governance, Trust and Democratic Engagement in Past and Present
Amount: \$170,273

Colleges and Institutes Canada (CICan) - CICan's Career Launcher Clean Tech program

The CICan Career Launcher Clean Tech Internship Program provides youth with work experience (via internships and training) that is focused on environmental and sustainable issues in a STEM field.

Kelsey Leonard (School of Environment, Resources and Sustainability)
received funding to hire an Indigenous Energy Justice Research Associate in this period.

Credit Valley Conservation Authority - Terrestrial Carbon Stock Estimation and Scenario Development

Using inventory data, this project estimates and predicts the total tons of carbon stored in the Credit River watershed's forests and plantations up to 2030.

Derek Robinson (Geography and Environmental Management) and Rebecca Saari (Civil and Environmental Engineering)

Title: Quantitative Greenhouse Gas Emissions and Sequestration Methods for Risk and Return on Investment Tool (RROIT)

Amount: \$80,000.00

Environment and Climate Change Canada

Environment and Climate Change Canada is responsible for the Transfer Payment Program entitled "Preventing and Managing Pollution" which provides funding for the Great Lakes and Freshwater Ecosystem Initiative program.

Chris Houser (Earth and Environmental Sciences)

Title: Engaging citizen scientists in monitoring coastal change within the Great Lakes

Amount: \$271,000

Mitacs

Mitacs is "Canada's leading innovation organization" that supports research and training through effective partnerships. Through matched funding programs, Mitacs connects researchers, government, and public and private sectors, to promote innovation, complex problem solving, economic growth and productivity across a diverse range of sectors including advanced manufacturing, AI, cleantech, cybersecurity, health and life sciences, IT, quantum, and beyond. The following six Mitacs projects received \$840K funding in this period:

Philip Beesley (School of Architecture)

Title: Applying the Spatialized Digital Milieu – Flexible Software and Controls Infrastructure Research for real-world Living Architecture Installations

Amount: \$120,000

Douglas Brown (Psychology)

Title: Monark Leadership Training Engagement

Amount: \$180,000

Costa Kapsis (Civil and Environmental Engineering)

Title: Development of surrogate model platform to quantify the impact of design decisions on energy consumption, peak demand, and greenhouse gas emissions for buildings in North America.

Amount: \$190,000

Veronika Magdanz (Systems Design Engineering)

Title: Biocompatible Inks for Advanced 3D Printing (BIAP)

Amount: \$150,000

Lennart Nacke (Stratford School of Interaction Design and Business)

Title: Enhancing Skilled Trades Training in the Industry through VR, Gamification, and Digital Twin Technologies

Amount: \$225,000

Leonardo Simon (Chemical Engineering)

Title: Manufacturing and Applications of Industrial Hemp Bioproducts

Amount: \$315,000

National Research Council Canada (NRC)

NRC is the primary national research and technology organization in Canada. It conducts scientific research, supports industrial innovation, and helps with the development of technologies across various sectors, including engineering, aerospace, health, and energy. In October 2024 two projects were funded that totaled \$679K:

Pooya Ronagh (Physics and Astronomy and Institute for Quantum Computing)

Title: Simulating non-equilibrium thermodynamics on a quantum computer with applications in generative artificial intelligence

Amount: \$412,500

Steven Young (School of Environment, Enterprise and Development)

Title: Life cycle inventory of battery materials for electric vehicles

Amount: \$266,664

The United States Air Force Office of Scientific Research

The United States Air Force Office of Scientific Research plans, coordinates, and executes the Air Force Research Laboratory's (AFRL) basic research program in response to technical guidance from AFRL and requirements of the Air Force.

Adam Wei Tsen (Chemistry)

Title: Generation, Detection, and Control of Coherent Magnon Transport and Condensation in a Two-Dimensional Magnet

Amount: \$151,776

Awards and Distinctions:

Research InfoSource Ranking

The University of Waterloo has been designated *Research University of the Year in the comprehensive category* by Research Infosource Inc. for the 17th consecutive year. Waterloo also ranked first for research income and corporate research income among Canada's Top 50 Research Universities in the comprehensive category, and second for not-for-profit research income in the same category.

Canada's Most Powerful Women: Top 100™ Award Winner in the Executive Leaders category, Women's Executive Network (WXN)

The Executive Leaders Award recognizes women who exemplify what it means to be a great leader in their organizations and communities, build confidence, champion equality and break down barriers for the next generation of leaders to come. This award was given to:

Andrea Edginton (School of Pharmacy) joined the ranks of remarkable and inspiring women across Canada in the Top 100 Award, Executive Leaders category.

Google Academic Research Award

This award aims to promote industry collaboration with researchers, fostering an ecosystem that generates impactful research with real-world applications. This award was given to: **Karen Cochrane (Stratford School of Interaction Design and Business)** for using GenAI to design an easy-to-use interface and visual instructions for creating adaptive switches to plug into gaming controllers for individuals with complex disabilities.

International Science Council Roster of Experts

The International Science Council is an international NGO with a mission to act as the global voice for science to promote science as a global public good. The ISC catalyzes and convenes scientific expertise and advice on issues of major concern to both science and society. The International Science Council (ISC) plays a crucial role in ensuring that science is central to addressing the world's most pressing issues, particularly those on the United Nations (UN) agenda. The ISC has established a **Global Roster of Experts** – a diverse and highly qualified group of individuals from around the world who stand ready to contribute their expertise.

The following faculty members have been appointed to this Global Roster of Experts to provide ad-hoc science advice to the UN Secretariat and Member States; prepare high-level policy briefs that inform critical multilateral discussions; draft statements on behalf of the global scientific community to amplify science's voice in international dialogues; intervene as speakers for high-level debates, conferences, and panels where scientific expertise can inform policy decisions.

- **Karla Boluk (Recreation and Leisure Studies)**
- **Zahid Butt (School of Public Health Sciences)**
- **Victor Cui (Conrad School of Entrepreneurship and Business)**
- **Michelle Ruty (Geography and Environmental Management)**
- **Solomon Tesfamariam (Civil and Environmental Engineering)**

[Clarivate Highly Cited Researchers](#)

Highly Cited Researchers™ are influential researchers at universities, research institutes and commercial organizations around the world who have demonstrated significant and broad influence in their field(s) of research.

The evaluation and selection process draws on data from Clarivate's Web of Science's™ citation index, together with analysis performed by bibliometric experts and data scientists at the Institute for Scientific Information (ISI).

Ten University of Waterloo faculty members have been named on the annual Highly Cited Researchers™ 2024 list from Clarivate. In addition, one former postdoctoral researcher and a Waterloo Alumni also made the list:

- **Zhongwei Chen (Chemical Engineering)**
 - **Geoffrey Fong (Psychology)**
 - **Michael Fowler (Chemical Engineering)**
 - **Sharon Kirkpatrick (School of Public Health Sciences)**
 - **Gaoran Li – (Former postdoctoral researcher-Chemical Engineering)**
 - **Juewen Liu (Chemistry)**
 - **Linda F. Nazar (Chemistry)**
 - **Quanquan Pang- (Waterloo Alumni- Chemistry)**
 - **Will Percival (Physics and Astronomy)**
 - **Daniel Scott (Geography and environmental Management)**
 - **Xuemin (Sherman) Shen (Electrical and Computer Engineering)**
 - **Aiping Yu (Chemical Engineering)**
-

Waterloo International:

During October, Waterloo International accomplished the following work towards its strategic goals:

Enhance International Priorities and Partnership Connections:

- Supported the delivery of a Health Futures Certificate program as part of the Faculty of Health's internationalization goals in expanding its online graduate degrees by welcoming 21 third-year health students from the United Arab Emirates to the University of Waterloo to learn about the future of health.

Support International Talent Pipeline Development and Student Mobility:

- Extended MOUs with the Technical University of Braunschweig (TUB) and Hamburg University of Technology (TUHH) to enhance student mobility exchange programs.
- Registered 295 international university-sanctioned trips and monitored over 1300 active travelers.
- Monitored 23 high-risk global incidents and coordinated with 7 travelers impacted by high-risk global incidents.

Develop New International Opportunities:

- Convened an externally funded conference on "Mapping out the Global Innovation Landscape" bringing together experts from academia, industry, and government to discuss Canada's role in the Indo-Pacific region to expand emerging and disruptive technologies, from artificial intelligence and biotechnology to quantum computing and autonomous systems.
- Waterloo International, together with the Faculty of Environment and Faculty of Science, was awarded a 2025 Queen Elizabeth II Diamond Jubilee Scholarship (QES) to deliver the program "Beyond Borders: Co-Learning to Tackle Climate Change and Plastic Pollution for Resilient Communities in Africa" where 30 University of Waterloo Students will have the opportunity to participate in an experiential field course in Ghana and Egypt.

For Information

Open Session

To: Senate

**Sponsor/
Presenter:** James W.E. Rush, Vice-President, Academic and Provost
provost@uwaterloo.ca

Date of Meeting: January 27, 2025

Agenda Item: **11.6.1 Report of the Provost – Faculty Appointments, Leaves**

Summary:

The Faculty Reports for Senators' information regarding the variety of appointments, reappointments, special appointments, leaves, and other matters of interest about individuals in the Faculties are available at the [Senate agenda page¹](#).

¹ <https://uwaterloo.ca/secretariat/sites/default/files/uploads/documents/all-faculty-january-2025.pdf>

For Information**Open Session****To:** Senate**Sponsor/Presenter:
Contact Information:** David DeVidi, Associate Vice-President, Academic
david.devidi@uwaterloo.caClarence Woudsma, Interim Co-Associate Vice-President, Graduate
Studies and Postdoctoral Affairs
cwoudsma@uwaterloo.ca**Date of Meeting:** January 27, 2025**Agenda Item
Identification:** 11.7 Committee Appointments – Teaching Awards**Recommendation/Motion:**

To approve the committee appointments for the Distinguished Teacher Awards and for the Amit & Meena Chakma Award for Exceptional Teaching by a Student, as presented in this report.

Summary:

Senate appoints the membership of the two awards committees. Per past precedent, staff in the Centre for Teaching Excellence have formed a recommended committee membership based on the terms of the awards.

Highlights:

The **Distinguished Teacher Awards (DTA)** are awarded to exemplary instructors at the University of Waterloo. The awards are open to all who teach at the University, and the main criterion of the award is a record of excellent teaching. The committee considers: evidence of intellectual vigour and communication skills in the interpretation and presentation of subject matter; evidence of educational impact beyond the classroom; the instructor's concern for and sensitivity to the needs of students; and a clear indication that the nominee has a favorable and lasting influence on students, and, where relevant, on colleagues. The DTA is awarded to four instructors annually and individuals are announced at the April meeting of Senate. The committee is appointed by Senate and consists of three undergraduate students, two graduate students, one alumni representative, three members of faculty (typically previous winners of the award), and the associate vice-president, academic as chair.

The **Amit & Meena Chakma Award for Exceptional Teaching by a Student (AETS)** awards are open to all students who have a formal teaching role at the University of Waterloo. Up to four awards are given annually in recognition of excellence in teaching of all kinds by registered students (e.g., teaching assistant, laboratory demonstrator, sessional lecturer). The selection committee considers intellectual vigour and communication skills in the interpretation and presentation of subject matter. Concern for and sensitivity to the academic need of the students is an important criterion. The committee is appointed by Senate and consists of three undergraduate students, two graduate students, two members of faculty, and the associate vice-president, graduate studies, and postdoctoral affairs as chair.

Recommended committee memberships:

Distinguished Teacher Awards (DTA)

Tiffany Bradley	Alumnus
Emma McDougall (Planning)	Graduate Student
Giuseppe William Femia (English language and literature)	Graduate Student
Cynthia Richard (Pharmacy)	Past award recipient
Greta Kroeker (History)	Past award recipient
Suzanne Kearns (Geography and Environmental Management)	Past award recipient
Charlie Uebele (environment and business, honours)	Undergraduate Student
Rachel Lam (Psychology)	Undergraduate Student
Catherine Dong (Mathematics)	Undergraduate Student
David DeVidi (AVPA)	Chair

Amit & Meena Chakma Award for Exceptional Teaching by a Student (AETS)

Carrie Mitchell	Associate Director of Undergraduate Studies and Associate Professor, School of Planning
Avery Kelly	Graduate Student
Ryan Lok	Graduate Student
Charley Potter	Undergraduate Student
Sara Agawa	Undergraduate Student
Ashdeep Gill	Undergraduate Student
Clarence Woudsma	Chair

Previous Action Taken:

Not applicable

Next Steps:

Announce the DTA and AETS winners at the April Senate meeting.

Governance Path:

Senate approval Date: 01/27/2025 [prospective]