UNIVERSITY OF WATERLOO

SENATE
MONDAY 18 September 2023
3:30 P.M. EST
NH 3407 / Zoom
Governing Documents and Resources

TIMING	AGENDA ITEM	PAGE	ACTION
	OPEN SESSION		
3:30 p.m.	1. Territorial Acknowledgement (Sheila Ager, Dean of Arts)	Oral	
	2. Conflict of Interest	Oral	Declaration
	3. Approval of the Agenda	Oral	Decision
	4. Minutes of the 19 June 2023 Meeting	5	Decision
	5. Business Arising from the Minutes	Oral	Input
	a. Senate Executive Committee approval of additions to UCSA committee membership	9	Information
	6. Senate Work Plan	11	Information
3:35 p.m. (40 mins)	7. Report of the President		
	a. President's Update	Oral	Information
	b. Update from Vice-President, Academic and Provost	Oral	Information
4:15 p.m. (15 mins)	8. Faculty Update Presentation – Engineering (Mary Wells)	Oral	Information
4:30 p.m. (15 mins)	9. Report – Senate Graduate & Research Council		
	a. Major Program Modification to the Master of Arts (MA) in Psychology To approve revisions to the Master of Arts (MA) in Psychology, effective 1 January 2024, as presented.	13	Decision
	b. New Academic Program - Master of Applied Science (MASc) in Electrical and Computer Engineering - Aeronautics To approve the proposed new academic program, Master of Applied Science (MASc) in Electrical and Computer Engineering - Aeronautics, effective 1 January 2024, as presented.	19	Decision
	c. New Academic Program - Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Aeronautics To approve the proposed new academic program, Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Aeronautics, effective 1 January 2024, as presented.	31	Decision

TIMING	AGENDA ITEM	PAGE	ACTION
	d. Graduate Studies Academic Calendar (GSAC) changes To approve the proposed revisions to the Graduate Studies Academic Calendar (GSAC), effective 1 September 2023, as presented.	47	Decision
4:45 p.m. (10 mins)	10. Report – Senate Undergraduate Council		
	a. Academic Plan Change – Diploma in Studies in Islam To approve the proposed academic plan revisions to the Diploma in Studies in Islam, for the Faculty of Arts, effective 1 September 2024, as presented.	55	Decision
	b. New Academic Plans - Diploma in Restorative Justice & Restorative Justice Specialization To approve the proposed new academic plans, Diploma in Restorative Justice, and Restorative Justice Specialization, for the Faculty of Arts, effective 1 September 2024, as presented.	57	Decision
	c. New Academic Plan – Social Innovation and Impact Minor To approve the proposed new academic plan, Social Innovation and Impact Minor, for the Faculty of Arts, effective 1 September 2024, as presented.	65	Decision
4:55 p.m. (5 mins)	11. Report – Senate Graduate & Research Council, and Senate Undergraduate Council		
	a. Course Delivery Modes To approve the adoption of the new and revised definitions for the undergraduate calendar and the graduate calendar (Glossary of terms), effective 1 September 2023, as presented.	69	Decision
5:00 p.m. (5 mins)	12. Amendment to Faculty Constitution – Engineering To approve the amendments to the *Constitution and By Laws for the Assembly and Faculty Council of the Faculty of Engineering* as recommended by the Engineering Faculty Assembly.	73	Decision
5:05 p.m. (5 mins)	**Consent Agenda** *Motion: To approve or receive for information the items on the consent agenda, listed as items 13-18 of the Senate agenda*		
	13. Report – Senate Undergraduate Council	79	Information
	14. Report - Vice-President, Research & International		
	a. Awards, Distinctions, Grants, Waterloo International Engagements	81	Information
	15. Report of the Provost – Faculty Appointments, Leaves	89	Information
	16. Report of the President – Tenure and Promotion of Faculty Members	91	Information

TIMING	AGENDA ITEM	PAGE	ACTION
	17. Call for Nominations for University Professor	95	Information
	18. Honorary Degrees Committee – Honorands for Fall 2023	99	Information
	19. Other Business	Oral	Input
5:10p.m. (5 mins)	**CONFIDENTIAL** Senators, Vice-Presidents, Secretariat and Technical Staff as required		
	20. Minutes of the 19 June 2023 Meeting	103	Decision
	21. Business Arising from the Minutes	Oral	Input
	22. Report of the President	Oral	Information
	23. Senate Effectiveness Survey	105	Information
	24. Other Business	Oral	Input
	25. Adjournment	Oral	Input

11 September 2023

Mike Grivicic
Associate University Secretary
Secretary to Senate

Important Dates

27 September 2023	Senate/Board Joint Retreat Session
9-13 October 2023	Fall Reading Week
20-21 October 2023	Convocation
23 October 2023	Senate Meeting

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Return to Agenda

University of Waterloo
SENATE
Minutes of the Monday 19 June 2023 Meeting
[in agenda order]

Present: Nasser Abukhdeir, Kathy Acheson (for Sheila Ager), Marc Aucoin, Lisa Aultman-Hall, Aubrey Basdeo, Jean Becker, Jeff Casello, Judy Castaneda, Trevor Charles, Joan Coutu, Kim Cuddington, Laura Deakin, Charmaine Dean, Jack DeGooyer, David DeVidi, Catherine Dong, Aiman Fatima, Mark Ferro, Paul Fieguth, Wendy Fletcher, Mark Giesbrecht, Vivek Goel (chair), Rob Gorbet, Kelly Grindrod, Mike Grivicic (Secretary), Vikas Gupta, David Ha, Peter Hall, Kevin Hare, Neela Hassan, Natalie Hutchings, Acey Kaspar, Achim Kempf, Veronica Kitchen, Scott Kline, Robert Lemieux, Lili Liu, Brad Lushman, Stephanie Maaz, Ellen MacEachen, Blake Madill, Colleen Maxwell, Peter Meehan, Kristiina Montero, Richard Myers, Cathy Newell Kelly, Alysia Kolentsis, Chris Nielsen, Rory Norris, James Nugent, Erin O'Connell, Troy Osborne, David Porreca, Luke Potwarka, Jacinda Reitsma, Cynthia Richard, Mary Robinson, James Rush, John Saabas, Beth Sandore Namachchivaya, Rida Sayed, Asher Scaini, Marcus Shantz, Sivabal Sivaloganathan, Siva Sivoththaman, James Skidmore, Christopher Taylor, Sharon Tucker, Graeme Turner, Diana Vangelisti, Dan Weber, Mary Wells, Stanley Woo, Clarence Woudsma, Changbao Wu, Annie Yang

Guests: Aldo Caputo, Kathy Becker, Catherine Burns, Nenone Donaldson, Bernard Duncker, Donna Ellis, Diana Goncalves, Melanie Figueiredo, Jenny Flagler-George, Sarah Hadley, Michelle Hollis, Diane Johnston, Jennifer Kieffer, Nick Manning, Laura McDonald, Ian Milligan, Anton Mosunov, Chris Read, Ian Rowlands, Daniela Seskar-Hencic, Nadia Singh, Allan Starr, Brandon Sweet, Anita Taylor, Sean Thomas, Sarah Willey-Thomas, Johanna Wandel, Katy Wong-Francq

Absent: John Abraham, Dominic Barton*, Kristine Dalton, Bruce Frayne, Murray Gamble*, Nadine Ibrahim, Sonia Ismail, Narveen Jandu, Martin Karsten, Christiane Lemieux, Xianguo Li, Carol Ann MacGregor, Jennifer Lynes Murray, Shana MacDonald, Ceileigh McAllister, Labibah Salim J Ali
*regrets

OPEN SESSION

CHAIR'S REMARKS

The chair welcomed new members Jean Becker, Paul Fieguth and Christopher Taylor. He noted the recent appointment of Greg Smith as the new Chief Information Officer. He spoke to recent and upcoming events on campus: today marks Juneteenth, which commemorates the emancipation of enslaved people in the United States; June is Pride Month and Waterloo is flying the two-spirit and intersex-inclusive progress flags for the first time; events planned for Indigenous Peoples History Month and for National Indigenous Peoples Day on 21 June.

Goel observed that this meeting is the final meeting of Senate for Robert Lemieux, who has served as Dean of Science for eight years. On behalf of Senate, he thanked Dean Lemieux for his tireless service to his Faculty and to the University.

1. TERRITORIAL ACKNOWLEDGEMENT

Goel provided the territorial acknowledgement and observed that Senate will commence a new practice in September of rotating the reading of the acknowledgement at each Senate meeting, starting with the deans.

2. CONFLICT OF INTEREST

Senators were asked to declare any conflicts they may have in relation to the items on the agenda. Abukhdeir noted a conflict with respect to item 15. No further conflicts were declared.

3. APPROVAL OF THE AGENDA

A motion was heard to approve the agenda as distributed. Casello and Porreca. Carried.

4. MINUTES OF THE 15 MAY 2023 MEETING

A motion was heard to approve the minutes as distributed. Kitchen and Woudsma. Carried.

5. BUSINESS ARISING FROM THE MINUTES

There was no business arising.

6. SENATE WORKPLAN

This item was received for information.

7. REPORT OF THE PRESIDENT

a. President's Update

Goel provided his report: at recent spring convocation ceremonies more than 7300 degrees, diplomas and certificates were awarded, with 10 honorary degrees and over 50 honorary members of the university; convocation ceremonies featured a new tradition of the ceremonial Eagle Staff leading the academic procession; announcement of tuition waiver for current and incoming students who are members of the Six Nations of the Grand River and the Mississaugas of the Credit First Nation; inaugural event Celebrating Black Communities on May 26, with 300 in attendance and featuring a keynote address from the Right Honorable Michaëlle Jean; Waterloo will host the upcoming WACE conference from June 28-30.

b. PART Annual Update

Christopher Taylor provided a short introduction and Anita Taylor provided a PowerPoint presentation, including: establishment and history of PART with a series of recommendations; progress against recommendations and related projects; recent initiatives launched to support Black and Indigenous students; commencement of Black Excellence Orientation Series. Namachchivaya observed that the Library and Print & Retail Services are co-sponsoring the Anti-Racism Reads book club.

8. REPORT OF THE VICE-PRESIDENT, ACADEMIC AND PROVOST

a. Digital Learning Strategy

Rush provided opening remarks noting the genesis of the strategy, the consultation with on-campus constituencies in the formulation of the strategy, and his acceptance of the report. Johanna Wandel provided a PowerPoint presentation: aim to develop a balanced strategy which promotes consistency while making room for autonomy and local decision-making; outreach to and consultations with the community through a variety of means including interviews, facilitated group discussions and surveys; the strategy is rooted in the principle that decisions on modality for a given course ought to occur at the same level as decisions on the course itself; seven core principles and objective of aligning strategic directions and actions. Members discussed: policy on intellectual property speaks to the posting of content to venues such as YouTube, and accessibility should also be considered by instructors when posting material; strategy can help to promote quality in digital offerings; technological changes in this space are in progress and this strategy reflects this reality; Waterloo has a real opportunity to lead in this space.

b. Recommendation to Change the Name of the Department of Management Sciences to the Department of Management Science and Engineering

Rush provided a short overview of the report and recommendation. A motion was heard to approve changing the name of the Department of Management Sciences to the Department of Management Science and Engineering. Rush and Wells. Carried.

9. REPORT – SENATE GRADUATE & RESEARCH COUNCIL

a. Graduate Studies Academic Calendar Revisions

Casello spoke to the proposed calendar revisions, which supports progress in fostering work-integrated learning within graduate studies at Waterloo. A motion was heard to approve revisions to the co-operative education section of the Graduate Studies Academic Calendar (GSAC) to include

Graduate Work-integrated Learning definitions and content, and to approve and add a new Community and Industry Research Projects (CIR) course component to the GSAC and Quest glossary of terms. Casello and DeVidi. Carried.

10. REPORT - ASSOCIATE VICE-PRESIDENT, ACADEMIC

a. Teaching Assessment Report

DeVidi observed: development of a common instrument for teaching assessment had been contemplated for some time; with the transition to the Student Course Perceptions survey, attention is being paid to the behaviour of that instrument; parallel work to develop complementary teaching assessment methods. Members discussed: measures to potentially counter declining response rates to the student surveys; processes for peer review of teaching; support from the Centre for Teaching Excellence can complement peer teaching review processes; differing views on the role of peer review in the context of teaching assessment vs. providing formative feedback to instructors; administration aims to form a task force to provide advice on the use of teaching assessment metrics in performance reviews; students require some mechanism to provide feedback on their instructor; teaching dossiers are another mechanism by which instructors can obtain feedback; fluctuations in teaching assessment feedback should not be cause for overreaction, but do provide an opportunity for a chair and instructor to exchange thoughts on how to respond in a formative way. Senate will arrange for a presentation from the Centre for Teaching Excellence on activities related to teaching assessment/ quality at a future meeting.

b. Digital Learning Principles and Guidelines

Aldo Caputo spoke to the report: significant change to the proposal since the initial discussion in November 2022, including clarifying the language around the principles. The recommendation would have Faculties develop their own processes to approve digital elements in courses. DeVidi added that different processes would be followed in each of the Faculties, based on the local culture and norms.

A motion was heard to approve the Principles and Guidelines for Digital Learning, effective 1 September 2023, as presented. DeVidi and Norris.

Members discussed: faculty involvement in these decisions is implicit within the collegial governance model, whether this occurs via faculty councils, departmental bodies or other mechanisms; this proposal responds to student feedback in that the use of a wide variety of online platforms has been onerous on students, and the proposal achieves a balanced response to those concerns while allowing for local decisions; students may not know when online synchronous courses are to be held when registering, and academic support units should be cognizant of this in arranging class schedules; digital courses and digital elements of courses ought to be of equivalent rigour and workload to the traditional offerings. Members noted that the principles and guidelines represent a rational approach to foster best practices, while some members questioned the need for the recommendations with the relatively positive experience of having pivoted to online formats in recent years.

A motion was heard to amend the main motion to amend item 3 of ‘Principles for an ONLINE class’ striking out “Dean or delegate or Vice-President Academic & Dean (VPAD)” and adding in its place “appropriate Faculty academic approval process, or appropriate academic approval process at the Affiliated/Federated Institution in conjunction with the relevant Faculty”. Nugent and Abukhdeir.

Members discussed: the proposed principles and guidelines offer no notion of control in these areas other than by faculty; pivoting to online delivery during pandemic periods caused significant strain on faculty, and the recommendation would be offering faculty greater support in that regard; it is beneficial to provide guardrails for online elements of courses.

The chair called the vote for the amending motion, and that motion was defeated.

The chair called the vote on the main motion, and that motion was carried with six opposed and one abstention.

CONSENT AGENDA
The chair noted that an error in the web link in item 14 was discovered and will be corrected. A motion was heard to approve or receive for information the items on the consent agenda, listed as items 11-17 of the Senate agenda. Hare and Porreca. Carried.

11. REPORT – SENATE GRADUATE & RESEARCH COUNCIL
Received for information.

12. REPORT – SENATE UNDERGRADUATE COUNCIL
Items under item 12 were received for information.

a. Academic Regulation Revision to Admission for the Faculty of Engineering
Motion: That Senate approve the proposed academic regulation revision to Admission for the Faculty of Engineering, effective 1 September 2024, as presented.

b. Academic Regulation for Admission Fraud
Motion: That Senate approve the proposed academic regulation revision for Admissions Fraud, effective 1 September 2023, as presented.

c. Academic Regulation Revision for Admission Requirements
Motion: That Senate approve the proposed academic regulation revisions of Admissions Requirement for Duolingo Component Scores, effective 1 September 2024, as presented.

13. REPORT – VICE-PRESIDENT, RESEARCH & INTERNATIONAL
a. Awards, Distinctions, Grants, Waterloo International Engagements
Received for information.

14. REPORT OF THE PROVOST– UNIVERSITY RESEARCH CHAIRS
Received for information.

15. REPORT OF THE PROVOST – FACULTY APPOINTMETS, LEAVES
Received for information.

16. LIST OF GRADUANDS – SPRING CONVOCATION
Received for information.

17. OTHER BUSINESS
a. Senate Orientation Module
Received for information.

b. The chair noted that some appointments to the University Committee on Student Appeals will require approval in the time between this meeting and the next regular meeting in September. It is anticipated that those approvals will be brought to Senate Executive Committee to be appropriately approved on behalf of Senate.

With no further business in open session, Senate convened in confidential session.

28 June 2023
MG/dg

Mike Grivicic
Associate University Secretary
Secretary to Senate

University of Waterloo
SENATE EXECUTIVE COMMITTEE
26 June 2023

FOR APPROVAL (via electronic poll)

_____

Elections to Senate Committees

Motion: To elect members to Senate committees/councils as described in this report.

University Committee on Student Appeals

Graduate Students

- Faculty of Health – Natalie Doan (term to 30 April 2025)
- Faculty of Engineering – Edward Yang (term to 30 April 2024)

Background:

According to Senate Bylaw 1, section 1.04(b):

> The Executive Committee shall have the following powers and duties:
> … to exercise the powers of Senate, within the limits of *The University of Waterloo Act, 1972,* on all matters considered by the Executive Committee in its discretion to be of sufficient urgency that they must be decided prior to the next regular meeting of Senate, provided that the Executive Committee shall have no power under any circumstances to repeal, amend or modify Senate bylaws, or to exercise Senate's responsibilities under Policies 45, 48, 50 and 68. All such actions are to be reported to Senate.

The proposed motion falls appropriately within the Executive Committee's empowerments, and Senate was notified at the meeting of 19 June 2023 of the intent to arrange for the Executive Committee to approve a small number of committee appointments on Senate's behalf over the summer months and ahead of the next regular meeting in September 2023.

Mike Grivicic

From: Mike Grivicic
Sent: Thursday, June 29, 2023 4:11 PM
To: 'sec@lists.uwaterloo.ca'
Subject: RE: SEC e-poll, approval of additions to UCSA committee membership

Thank you to members for your responses.

This is to advise that, having received a quorum of replies from SEC members, the appointments to UCSA are approved unanimously.

Mike Grivicic, MA
Associate University Secretary

From: Mike Grivicic
Sent: Monday, June 26, 2023 2:06 PM
To: 'sec@lists.uwaterloo.ca' <sec@lists.uwaterloo.ca>
Subject: SEC e-poll, approval of additions to UCSA committee membership

To members, Senate Executive Committee:

We have received nominations for two (2) graduate student representatives to fill appointments on the University Committee on Student Appeals, with one term to 30 April 2024 and the other term to 30 April 2025. A draft report with the recommendation is attached for SEC's approval on behalf of Senate, and the rationale included with the recommendation details the bylaw provisions under which SEC may appropriately make this approval.

REQUEST: Please respond to this email indicating your support to recommend this report to Senate, or your vote against, or abstention. The first person to respond in support of the motion will be considered the mover, and the second person to respond will be considered as the seconder.

Kindly reply with your vote **before 4:00 p.m. on Thursday 29 June 2023**.

For any questions, please contact me directly.

Mike Grivicic, MA
Associate University Secretary

UNIVERSITY OF WATERLOO

2023-2024 Senate Work Plan

Office of the Secretariat

Senate Agenda Items · expected *as needed	**15 May 2023**	**19 June 2023**	**18 September 2023**	**23 October 2023** *Strategic Plan Annual Update / Waterloo at 100*	**27 November 2023**	**29 January 2024**	**4 March 2024**	**8 April 2024**
REGULAR AGENDA (including items for information and discussion)								
Minutes	·	·	·	·	·	·	·	·
Business Arising	·	·	·	·	·	·	·	·
LEADERSHIP UPDATES[6]								
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				·		·		·
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							·	
Delegation of Roster of Graduands								·
Report of Roster of Graduands		·		·				
Convocation Report (CR&E) – summary of previous years' ceremonies							·	
Undergraduate and Graduate Admissions Update					·			
Conduct Self-Assessment Survey[1]							·	
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 Update (6x/year)			ENG	HLTH	MATH	ENV	ARTS	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.

Return to Agenda

Senate Agenda Items · expected *as needed	15 May 2023	19 June 2023	23 September 2023	23 October 2023 *Strategic Plan Annual Update / Waterloo at 100*	27 November 2023	29 January 2024	4 March 2024	8 April 2024
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]		·						

Joint SENATE/BOARD Strategic Plan Focus Sessions 3-4:30	Joint SENATE/BOARD Continuing Education Sessions 3-4:30
• To be determined	• To be determined

Special Topics for 2023-2024 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
[4] Presented by the President and Vice-Chancellor, and Chair of Senate
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Senate Graduate and Research Council

For Approval	**Open Session**
To:	**Senate**
Sponsor: **Contact Information:**	Charmaine Dean Vice-President, Research & International
Sponsor: **Contact Information:**	Jeff Casello Associate Vice-President, Graduate Studies and Postdoctoral Affairs
Presenter: **Contact Info:**	Jeff Casello jcasello@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**9a. Report – Senate Graduate & Research Council: Major Program Modification to the Master of Arts (MA) in Psychology**

Recommendation/Motion:

To approve revisions to the Master of Arts (MA) in Psychology, effective 1 January 2024, as presented.

Summary:

Senate Graduate & Research Council met on 12 June 2023 and agreed to forward the following item to Senate for approval as part of the Regular agenda.

Jurisdictional Information:

This item is being submitted to Senate in accordance with Senate Bylaw 2; section 4.03(e): "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:

Department approval date (mm/dd/d\yy): 04/11/23
Graduate Studies and Postdoctoral Affairs review date (mm/dd/d\yy): 04/13/23
Faculty approval date (mm/dd/yy): 05/16/23
Senate Graduate & Research Council approval date (mm/dd/yy): 06/12/23

Highlights/Rationale:

Currently, students who wish to do a Master's degree in Developmental Psychology only have the MASc in Psychology - Developmental & Communication Science option. This MASc program was originally designed for students with more applied interests, or who are unsure about continuing to a PhD. It is a fast-tracked 1-year (3-term) program that has a reduced research requirement, requiring a Masters Research Paper (rather than a thesis), as well as a community internship. For students who intend to continue on to a PhD, having a2-year research-focused MA degree with a thesis would be advantageous. We have recently needed to transfer some students in the MASc program to a non-specialized research field MA in order to accommodate their research goals, and current graduate students who have been consulted with have expressed that having a research focused Developmental Psychology MA option to apply to and enroll into would be advantageous. Essentially, adding the Developmental Psychology graduate research field to the MA program will provide more flexibility for students, and also align the requirements of the Developmental Psychology program with those of the other research fields. Furthermore, the PhD program already has the Developmental Psychology graduate research field, so adding this field at the MA level will provide continuity for students.

It can be advantageous for students to have their graduate research field area noted on their transcripts. We are adding clarity to the Calendar in order for the graduate research field designation to be added to the transcript.

Documentation Provided:

Program Revision Template – Appendix A

Appendix A

UNIVERSITY OF WATERLOO

Graduate Studies

Program Revision Template

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: Arts

Program: Master of Arts (MA) in Psychology

Program contact name(s): Jonathan Fugelsang

Form completed by: Jonathan Fugelsang

Description of proposed changes:

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

1) *Updating the MA degree requirements to include a "Developmental Psychology" graduate research field.*

2) *Articulating the criteria for students to obtain a graduate research field designation on their transcript.*

Is this a major modification to the program? Yes

Rationale for change(s):

1) *Currently, students who wish to do a Master's degree in Developmental Psychology only have the MASc in Psychology - Developmental & Communication Science option. This MASc program was originally designed for students with more applied interests, or who are unsure about continuing to a PhD. It is a fast-tracked 1-year (3-term) program that has a reduced research requirement, requiring a Masters Research Paper (rather than a thesis), as well as a community internship. For students who intend to continue on to a PhD, having a 2-year research-focused MA degree with a thesis would be advantageous. We have recently needed to transfer some students in the MASc program to a non-specialized research field MA in order to accommodate their research goals, and current graduate students who have been consulted with have expressed that having a research focused Developmental Psychology MA option to apply to and enroll into would be advantageous. Essentially, adding the Developmental Psychology graduate research field to the MA program will provide more flexibility for students, and also align the requirements of the Developmental Psychology program with those of the other research fields. Furthermore, the PhD program already has the Developmental Psychology graduate research field, so adding this field at the MA level will provide continuity for students.*

2) *It can be advantageous for students to have their graduate research field area noted on their transcripts. We are adding clarity to the Calendar in order for the graduate research field designation to be added to the transcript.*

Proposed effective date: Term: Winter Year: 2024

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-psychology/master-arts-ma-psychology

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

## Graduate research fields 	
 	
• Clinical Psychology
• Cognitive Neuroscience
• Cognitive Psychology
• Social Psychology
 	
## Degree requirements 	
 	
### Thesis option: 	
 	
• **Courses**
  ○ Students must complete 2 two-term or 4 one-term courses accepted for graduate credit by the Department. Specific course offerings in each Area will differ from year to year. The statistics requirement may be met by satisfactory performance in at least 1 of 2 core statistics courses: PSYCH 630 Advanced Analysis of Variance and PSYCH 632 Multiple Regression.
 	
• **Master's Thesis**
 	
### Master's Research Paper option: 	
 	
Note: students must receive special permission from the Department to enter the Master's Research Paper option.
 	
• **Courses**
  ○ Students must complete 4 two-term or 8 one-term courses, accepted for graduate credit by the Department. The statistics requirement may be met by satisfactory performance in at least 1 of 2 core statistics courses: PSYCH 630 Advanced Analysis of Variance and PSYCH 632 Multiple Regression.
 	
• **Master's Research Paper**
	## Graduate research fields
	
	• Clinical Psychology
	• Cognitive Neuroscience
	• Cognitive Psychology
	• Developmental Psychology
	• Social Psychology
	
	## Degree requirements
	
	### Thesis option:
	
	• **Courses**
	  ○ Students must complete 2 two-term or 4 one-term courses accepted for graduate credit by the Department. Specific course offerings in each Area will differ from year to year. The statistics requirement may be met by satisfactory performance in at least 1 of 2 core statistics courses: PSYCH 630 Advanced Analysis of Variance and PSYCH 632 Multiple Regression.
	
	• **Master's Thesis**
	  ○ Students must be admitted to one of the following Graduate Research Fields:
	  ▪ Clinical Psychology
	  ▪ Cognitive Neuroscience
	  ▪ Cognitive Psychology
	  ▪ Developmental Psychology
	  ▪ Social Psychology
	  ○ A Graduate Research Field is a University credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research concentrated in the area of the Graduate Research Field. The Department, represented by the student's supervisor and reading committee must assess whether a student's completed research warrants the field designation at the time of degree completion. To obtain the Graduate Research Field designation, a student must also complete the

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	requirements associated with the MA degree. Master's Research Paper option: Note: students must receive special permission from the Department to enter the Master's Research Paper option. • **Courses** o Students must complete 4 two-term or 8 one-term courses, accepted for graduate credit by the Department. The statistics requirement may be met by satisfactory performance in at least 1 of 2 core statistics courses: PSYCH 630 Advanced Analysis of Variance and PSYCH 632 Multiple Regression. • **Master's Research Paper** o Students must be admitted to one of the following Graduate Research Fields: ▪ Clinical Psychology ▪ Cognitive Neuroscience ▪ Cognitive Psychology ▪ Developmental Psychology ▪ Social Psychology o A Graduate Research Field is a University credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research concentrated in the area of the Graduate Research Field. The Department, represented by the student's supervisor and one additional reader must assess whether a student's completed research warrants the field designation at the time of degree completion. To obtain the Graduate Research Field designation, a student must also complete the requirements associated with the MA degree.

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

Adding the MA graduate research field will not affect students already registered in the program.

Articulating the criteria for students to obtain a graduate research field designation on their transcript will permit students currently enrolled in the program to receive that designation on their transcript when they graduate.

Department/School approval date (mm/dd/yy): 04/11/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 04/13/23
Faculty approval date (mm/dd/yy): 05/16/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if appl

Senate Graduate and Research Council

For Approval	**Open Session**
To:	**Senate**
Sponsor: **Contact Information:**	Charmaine Dean Vice-President, Research & International
Sponsor: **Contact Information:**	Jeff Casello Associate Vice-President, Graduate Studies and Postdoctoral Affairs
Presenter: **Contact Info:**	Jeff Casello jcasello@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**9b. Report – Senate Graduate & Research Council: New Academic Program - Master of Applied Science (MASc) in Electrical and Computer Engineering - Aeronautics**

Recommendation/Motion:

To approve the proposed new academic program, Master of Applied Science (MASc) in Electrical and Computer Engineering - Aeronautics, effective 1 January 2024, as presented.

Summary:

Senate Graduate & Research Council met on 12 June 2023 and agreed to forward the following item to Senate for approval as part of the Regular agenda.

Jurisdictional Information:

This item is being submitted to Senate in accordance with Senate Bylaw 2; section 4.03(e): "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:

Department approval date (mm/dd/d\yy): 02/16/23
Graduate Studies and Postdoctoral Affairs review date (mm/dd/d\yy): 05/08/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council approval date (mm/dd/yy): 06/12/23

Highlights/Rationale:

The Department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program (CAP) and is thus adding a Master of Applied Science (MASc) in Electrical and Computer Engineering – Aeronautics program.

After consultation with the ECE Graduate Studies Committee, which consists of Faculty and Graduate Student representatives, the department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program. Joining the CAP aligns with research that is already being conducted by faculty and graduate students in this area.

Documentation Provided:

Program Revision Template – Appendix A

Graduate Studies Program Revision Template

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

Program: Master of Applied Science (MASc) in Electrical and Computer Engineering - Aeronautics

Program contact name(s): Christopher Nielsen, Jared Rank

Form completed by: Christopher Nielsen, Jared Rank

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

The Department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program (CAP) and is thus adding a Master of Applied Science (MASc) in Electrical and Computer Engineering - Aeronautics program.

Is this a major modification to the program? Yes

Rationale for change(s):

After consultation with the ECE Graduate Studies Committee, which consists of Faculty and Graduate Student representatives, the Department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program. Joining the CAP aligns with research that is already being conducted by faculty and graduate students in this area.

Proposed effective date: Term: Winter Year: 2024

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-electrical-and-computer-engineering

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	**Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
MASTER OF APPLIED SCIENCE (MASC) IN ELECTRICAL AND COMPUTER ENGINEERING **Graduate research fields** • Antennas, Microwaves and Wave Optics • Biomedical	**MASTER OF APPLIED SCIENCE (MASC) IN ELECTRICAL AND COMPUTER ENGINEERING - AERONAUTICS** ~~**Graduate research fields**~~ • ~~Antennas, Microwaves and Wave Optics~~ • ~~Biomedical~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	**Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
• Circuits and Systems Including Computer - Aided Design • Communications and Information Systems • Computer Hardware • Computer Software • Nanotechnology • Pattern Analysis and Machine Intelligence (PAMI) • Power and Energy Systems • Quantum Information • Silicon Devices and Integrated Circuits • Systems and Control • Very Large Scale Integration (VLSI) • Wireless Communication	~~• Circuits and Systems Including Computer - Aided Design~~ ~~• Communications and Information Systems~~ ~~• Computer Hardware~~ ~~• Computer Software~~ ~~• Nanotechnology~~ ~~• Pattern Analysis and Machine Intelligence (PAMI)~~ ~~• Power and Energy Systems~~ ~~• Quantum Information~~ ~~• Silicon Devices and Integrated Circuits~~ ~~• Systems and Control~~ ~~• Very Large Scale Integration (VLSI)~~ ~~• Wireless Communication~~

Program information
 	
• **Admit term(s)**
  ○ Fall
  ○ Winter
  ○ Spring
 	
• **Delivery mode**
  ○ On-campus
 	
• **Length of program**
  ○ The minimum period of registration for the Master's degree is two terms after an Honours Bachelor's degree or equivalent. The maximum time limit is six terms for the regular program and fifteen terms for the part-time program. Extensions beyond six terms must be approved by the Faculty Graduate Studies Office.
 	
• **Program type**
  ○ Master's
  ○ Research
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Thesis
	Program information
	
	• **Admit term(s)**
	  ○ Fall
	  ○ Winter
	  ○ Spring
	
	• **Delivery mode**
	  ○ On-campus
	
	• **Length of program**
	  ○ The minimum period of registration for the Master's degree is two terms after an Honours Bachelor's degree or equivalent. The maximum time limit is six terms for the regular program and fifteen terms for the part-time program. Extensions beyond six terms must be approved by the Faculty Graduate Studies Office.
	
	• **Program type**
	  ○ <u>Collaborative</u>
	  ○ Master's
	  ○ Research
	
	• **Registration option(s)**
	  ○ Full-time
	  ○ Part-time
	
	• **Study option(s)**
	  ○ Thesis

Admission requirements
 	
• **Minimum requirements**
  ○ The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last
	Admission requirements
	
	• **Minimum requirements**
	  ○ The Department of Electrical and Computer Engineering requires either

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	**Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
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. ○ At the time of admission, each student must have a faculty supervisor who has endorsed the recommendation for admission. • **Application materials** ○ Résumé ○ Supplementary information form ○ Transcript(s) • **References** ○ Number of references: 2 ○ Type of references: at least 1 academic • **English language proficiency (ELP)** (if applicable) **Degree requirements** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ The requirements for the program consist of at least 5 courses (0.50 unit weight per course) of graduate credit. A minimum of 3 courses must be taken from within the Faculty of Engineering. A maximum of 2 courses may be taken from outside the Faculty but must be from the Faculties of Math and/or Science. At least 2 of the courses must be from the list of approved core courses (updated by the Department annually) in one of the approved areas of specialization as specified in the student's letter of admission. All MASc students are required to take a	(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. ○ At the time of admission, each student must have a faculty supervisor who has endorsed the recommendation for admission. • **Application materials** ○ Résumé ○ Supplementary information form ○ Transcript(s) • **References** ○ Number of references: 2 ○ Type of references: at least 1 academic • **English language proficiency (ELP)** (if applicable) **Degree requirements** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must obtain ~~The requirements for the program consist of~~ at least 6 courses (0.50 unit weight per course) of graduate credit including 2 Aeronautics core courses. ~~A minimum of 3 courses must be taken from within the Faculty of Engineering. A maximum of 2 courses may be taken from outside the Faculty but must be from the Faculties of Math and/or Science. At least 2 courses must be from the list of approved core courses (updated by the Department annually) in one of the approved areas of specialization as~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	**Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
minimum of 2 ECE courses toward their degree requirements. Core courses may count towards this 2 course minimum. The choice of courses must meet with the approval of the supervisor. ○ Core courses: ▪ Antennas, Microwaves, and Wave Optics ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 671 Microwave and RF Engineering ▪ ECE 672 Optoelectronic Devices ▪ ECE 675 Radiation and Propagation of Electromagnetic Fields ▪ Biomedical ▪ ECE 601 Foundations of Biology in Engineering ▪ ECE 607 Fundamentals of Ultrasonics ▪ ECE 608 Quantitative Methods in Biomedical Engineering ▪ ECE 609 Engineering Analysis of Living Cells ▪ Circuits and Systems ▪ ECE 636 Advanced Analog Integrated Circuits ▪ ECE 637 Digital Integrated Circuits ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 671 Microwave and RF Engineering ▪ Communications and Information Systems ▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) ▪ ECE 603 Statistical Signal Processing ▪ ECE 604 Stochastic Processes	~~specified in the student's letter of admission. All MASc~~ Students are required to take a minimum of 2 ECE courses toward their degree requirements. ~~Core courses may count towards this 2 course minimum.~~ The choice of courses must meet with the approval of the supervisor. ○ Aeronautics core courses: ▪ AVIA 601 Interdisciplinary Aeronautics ▪ AVIA 602 Interdisciplinary Aeronautics Project ○ Aside from AVIA 601 & AVIA 602, only courses from the Faculties of Science, Math and Engineering are permitted. ○ ~~ECE core courses:~~ ▪ ~~Antennas, Microwaves, and Wave Optics~~ ▪ ~~ECE 642 Radio Frequency Integrated Circuit Design~~ ▪ ~~ECE 671 Microwave and RF Engineering~~ ▪ ~~ECE 672 Optoelectronic Devices~~ ▪ ~~ECE 675 Radiation and Propagation of Electromagnetic Fields~~ ▪ ~~Biomedical~~ ▪ ~~ECE 601 Foundations of Biology in Engineering~~ ▪ ~~ECE 607 Fundamentals of Ultrasonics~~ ▪ ~~ECE 608 Quantitative Methods in Biomedical Engineering~~ ▪ ~~ECE 609 Engineering Analysis of Living Cells~~ ▪ ~~Circuits and Systems~~ ▪ ~~ECE 636 Advanced Analog Integrated Circuits~~ ▪ ~~ECE 637 Digital Integrated Circuits~~ ▪ ~~ECE 642 Radio Frequency Integrated Circuit Design~~ ▪ ~~ECE 671 Microwave and RF Engineering~~ ▪ ~~Communications and Information Systems~~ ▪ ~~ECE 602 Introduction to Optimization or CO 602~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
▪ ECE 610 Broadband Communication Networks ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 613 Image Processing and Visual Communication ▪ Computer Hardware ▪ ECE 606 Algorithm Design ▪ ECE 621 Computer Organization ▪ ECE 627 Register-transfer-level Digital Systems ▪ ECE 637 Digital Integrated Circuits ▪ Computer Software ▪ ECE 606 Algorithm Design and Analysis or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) or CS 666 Algorithm Design and Analysis ▪ ECE 652 Methods and Principles of Safety-critical Embedded Software ▪ ECE 653 Software Testing, Quality Assurance and Maintenance or CS 647 Software Testing, Quality Assurance, and Maintenance ▪ ECE 654 Software Reliability Engineering ▪ ECE 656 Database Systems ▪ ECE 657A Data and Knowledge Modelling and Analysis or CS 680 Introduction to Machine Learning or CS 686 Introduction to Artificial Intelligence ▪ CO 685 The Mathematics of Public-Key Cryptography or CS	~~Fundamentals of Optimization (cross-listed with CM 740 and CS 795)~~ ~~▪ ECE 603 Statistical Signal Processing~~ ~~▪ ECE 604 Stochastic Processes~~ ~~▪ ECE 610 Broadband Communication Networks~~ ~~▪ ECE 611 Digital Communications~~ ~~▪ ECE 612 Information Theory~~ ~~▪ ECE 613 Image Processing and Visual Communication~~ ~~▪ Computer Hardware~~ ~~▪ ECE 606 Algorithm Design~~ ~~▪ ECE 621 Computer Organization~~ ~~▪ ECE 627 Register-transfer-level Digital Systems~~ ~~▪ ECE 637 Digital Integrated Circuits~~ ~~▪ Computer Software~~ ~~▪ ECE 606 Algorithm Design and Analysis or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) or CS 666 Algorithm Design and Analysis~~ ~~▪ ECE 652 Methods and Principles of Safety-critical Embedded Software~~ ~~▪ ECE 653 Software Testing, Quality Assurance and Maintenance or CS 647 Software Testing, Quality Assurance, and Maintenance~~ ~~▪ ECE 654 Software Reliability Engineering~~ ~~▪ ECE 656 Database Systems~~ ~~▪ ECE 657A Data and Knowledge Modelling~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
658 Computer Security and Privacy or CO 687 Applied Cryptography ▪ Nanotechnology ▪ ECE 630 Physics and Models of Semiconductor Devices ▪ ECE 633 Nanoelectronics ▪ ECE 634 Organic Electronics ▪ ECE 635 Fabrication in the Nanoscale: Principles, Technology and Applications ▪ ECE 672 Optoelectronic Devices ▪ PAMI - Pattern Analysis and Machine Intelligence ▪ ECE 606 Algorithm Design and Analysis ▪ ECE 613 Image Processing and Visual Communication ▪ ECE 657 Tools of Intelligent Systems Design ▪ ECE 657A Data and Knowledge Modelling and Analysis ▪ ECE 659 Intelligent Sensors and Sensor Networks ▪ Power and Energy Systems ▪ ECE 662 Power Systems Analysis and Control ▪ ECE 663 Energy Processing ▪ ECE 665 High Voltage Engineering Applications ▪ ECE 666 Power Systems Operation ▪ ECE 668 Distribution System Engineering ▪ ECE 760 Special Topics in Power Systems and High Voltage Engineering (topic 11 Power System Protection and Relaying) or ECE 765 Power System Protection and Relaying	~~and Analysis or CS 680 Introduction to Machine Learning or CS 686 Introduction to Artificial Intelligence~~ ~~▪ CO 685 The Mathematics of Public-Key Cryptography or CS 658 Computer Security and Privacy or CO 687 Applied Cryptography~~ ~~▪ Nanotechnology~~ ~~▪ ECE 630 Physics and Models of Semiconductor Devices~~ ~~▪ ECE 633 Nanoelectronics~~ ~~▪ ECE 634 Organic Electronics~~ ~~▪ ECE 635 Fabrication in the Nanoscale: Principles, Technology and Applications~~ ~~▪ ECE 672 Optoelectronic Devices~~ ~~▪ PAMI - Pattern Analysis and Machine Intelligence~~ ~~▪ ECE 606 Algorithm Design and Analysis~~ ~~▪ ECE 613 Image Processing and Visual Communication~~ ~~▪ ECE 657 Tools of Intelligent Systems Design~~ ~~▪ ECE 657A Data and Knowledge Modelling and Analysis~~ ~~▪ ECE 659 Intelligent Sensors and Sensor Networks~~ ~~▪ Power and Energy Systems~~ ~~▪ ECE 662 Power Systems Analysis and Control~~ ~~▪ ECE 663 Energy Processing~~ ~~▪ ECE 665 High Voltage Engineering Applications~~ ~~▪ ECE 666 Power Systems Operation~~ ~~▪ ECE 668 Distribution System Engineering~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	**Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
▪ Quantum Information ▪ ECE 676 Quantum Information Processing Devices (cross-listed with QIC 750) ▪ ECE 677 Quantum Electronics and Photonics (cross-listed with QIC 885) ▪ QIC 710 Quantum Information Processing ▪ Silicon Devices and Integrated Circuits ▪ ECE 630 Physics and Models of Semiconductor Devices ▪ ECE 631 Microelectronic Processing Technology ▪ ECE 634 Organic Electronics ▪ ECE 636 Advanced Analog Integrated Circuits ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 672 Optoelectronic Devices ▪ Systems and Controls ▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) ▪ ECE 604 Stochastic Processes ▪ ECE 682 Multivariable Control Systems ▪ ECE 686 Filtering and Control of Stochastic Linear Systems ▪ ECE 688 Nonlinear Systems ▪ VLSI - Very Large Scale Integration ▪ ECE 636 Advanced Analog Integrated Circuits ▪ ECE 637 Digital Integrated Circuits ▪ ECE 642 Radio Frequency Integrated Circuit Design	~~▪ ECE 760 Special Topics in Power Systems and High Voltage Engineering (topic 11 Power System Protection and Relaying) or ECE 765 Power System Protection and Relaying~~ ~~▪ Quantum Information~~ ~~▪ ECE 676 Quantum Information Processing Devices (cross-listed with QIC 750)~~ ~~▪ ECE 677 Quantum Electronics and Photonics (cross-listed with QIC 885)~~ ~~▪ QIC 710 Quantum Information Processing~~ ~~▪ Silicon Devices and Integrated Circuits~~ ~~▪ ECE 630 Physics and Models of Semiconductor Devices~~ ~~▪ ECE 631 Microelectronic Processing Technology~~ ~~▪ ECE 634 Organic Electronics~~ ~~▪ ECE 636 Advanced Analog Integrated Circuits~~ ~~▪ ECE 642 Radio Frequency Integrated Circuit Design~~ ~~▪ ECE 672 Optoelectronic Devices~~ ~~▪ Systems and Controls~~ ~~▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795)~~ ~~▪ ECE 604 Stochastic Processes~~ ~~▪ ECE 682 Multivariable Control Systems~~ ~~▪ ECE 686 Filtering and Control of Stochastic Linear Systems~~ ~~▪ ECE 688 Nonlinear Systems~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	**Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
▪ ECE 671 Microwave and RF Engineering ▪ Wireless Communication ▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) ▪ ECE 603 Statistical Signal Processing ▪ ECE 604 Stochastic Processes ▪ ECE 610 Broadband Communication Networks ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 613 Image Processing and Visual Communication ○ Students are normally expected to take graduate courses at the 600 or 700 level. 1 advanced undergraduate (400 level) Electrical or Computer Engineering course may be allowed for graduate credit. It is expected that both the student and supervisor should provide adequate justification and complete the required paperwork before any undergraduate course is approved for credit. ○ The advanced undergraduate courses must be at the 400 or 500 level as given in the Undergraduate Studies Academic Calendar and must be approved for graduate credit and confirmed in writing by the Department Associate Chair for Graduate Studies at the time of registration. ○ Students may be required at any time to withdraw from the program if they fail to maintain a minimum grade of 65% in each of the 5 courses and a cumulative average of at least 70% in the coursework portion of their approved study program or if they fail to receive satisfactory progress reports regarding their research activities. ○ The Department may recommend that credit be allowed for courses taken at other institutions. In special cases, 2	~~▪ VLSI - Very Large Scale Integration~~ ~~▪ ECE 636 Advanced Analog Integrated Circuits~~ ~~▪ ECE 637 Digital Integrated Circuits~~ ~~▪ ECE 642 Radio Frequency Integrated Circuit Design~~ ~~▪ ECE 671 Microwave and RF Engineering~~ ~~▪ Wireless Communication~~ ~~▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795)~~ ~~▪ ECE 603 Statistical Signal Processing~~ ~~▪ ECE 604 Stochastic Processes~~ ~~▪ ECE 610 Broadband Communication Networks~~ ~~▪ ECE 611 Digital Communications~~ ~~▪ ECE 612 Information Theory~~ ~~▪ ECE 613 Image Processing and Visual Communication~~ ○ Students are normally expected to take graduate courses at the 600 or 700 level or higher as per the Graduate Studies Academic Calendar. ○ One (1) advanced undergraduate (at the 400 or 500 level as per the Undergraduate Studies Academic Calendar) Electrical or Computer Engineering course may be permitted for graduate credit. ~~It is expected that~~ Both the student and supervisor ~~should~~ must provide adequate justification and complete the required paperwork before any undergraduate course is approved for credit. ○ The advanced undergraduate courses must ~~be at the 400 or 500 level as given in the Undergraduate Studies Academic Calendar and must~~ be approved for graduate credit and confirmed in writing by the Department

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
courses (0.50 unit weight) may be approved. • **Master's Seminar** ○ Students are required to present a seminar on their thesis topic as part of the degree requirements. The purpose of this seminar is to develop the student's ability to communicate the results of a research work in an organized and informative manner. The seminar is not an oral examination of the thesis. The seminar should be held during the term the thesis is submitted to the readers. The supervisor(s), plus one other Faculty member must be in attendance at the seminar in order for the student to receive credit. • **Master's Thesis** ○ The topic of the thesis and the choice of the required 5 courses of graduate coursework are arranged by students and their faculty supervisor. Each student's program is subject to approval by the Graduate Studies Committee of the Department. Students must maintain continuous active registration until the thesis requirements are completed. The research work leading to the thesis must be performed under the direction of the faculty supervisor(s) and is finally approved and accepted by at least three readers. The readers will consist of the supervisor(s) plus a minimum of two other faculty members.	Associate Chair for Graduate Studies at the time of registration. ○ This degree is offered through the Collaborative Aeronautics Program. This program, jointly offered by a range of departments/schools across several academic faculties, promotes the development of interdisciplinary perspectives on aeronautics. Collaborative Aeronautics Program students complete their specialist training in their respective home departments/schools, while working with colleagues from a variety of other departments/schools in core interdisciplinary courses (AVIA 601 and AVIA 602). ○ To obtain credit, an individual course must be passed with at least a 65% average. ○ Students may be required ~~at any time~~ to withdraw from the program at any time if they fail to maintain a minimum ~~grade of 65% in each of the 5 courses and a~~ cumulative average of ~~at least~~ 70% in their coursework ~~portion of their approved study program or~~ if they fail to receive satisfactory progress reports regarding their research activities. ○ The Department may recommend that credit be allowed for courses taken at other institutions. In special cases, a maximum of 2 courses (0.50 unit weight) may be approved. • **Master's Seminar** ○ Students are required to present a seminar on their thesis topic as part of the degree requirements. The purpose of this seminar is to develop the student's ability to communicate the results of a research work in an organized and informative manner. The seminar is not an oral examination of the thesis. The seminar should be held during the term the thesis is submitted to the readers. The supervisor(s), plus one other Faculty member must be in attendance at the seminar in order for the student to receive credit. • **Master's Thesis** ○ The topic of the thesis ~~and the choice of the required 5 courses of graduate~~

Current MASc in Electrical and Computer Engineering Graduate Studies Academic Calendar content:	Proposed MASc in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
	~~coursework are~~ is arranged by students and their faculty supervisor. Each student's program is subject to approval by the Graduate Studies Committee of the Department. Students must maintain continuous active registration until the thesis requirements are completed. The research work leading to the thesis must be performed under the direction of the faculty supervisor(s) and is finally approved and accepted by at least three readers. The readers will consist of the supervisor(s) plus a minimum of two other faculty members.

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

Current students will be able to submit a program change to the Collaborative Aeronautics Program.

Department/School approval date (mm/dd/yy): 02/16/2023
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 05/08/23
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**
Sponsor: **Contact Information:**	Charmaine Dean Vice-President, Research & International
Sponsor: **Contact Information:**	Jeff Casello Associate Vice-President, Graduate Studies and Postdoctoral Affairs
Presenter: **Contact Info:**	Jeff Casello jcasello@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**9c. Report – Senate Graduate & Research Council: New Academic Program - Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Aeronautics**

Recommendation/Motion:

To approve the proposed new academic program, Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Aeronautics, effective 1 January 2024, as presented.

Summary:

Senate Graduate & Research Council met on 12 June 2023 and agreed to forward the following item to Senate for approval as part of the Regular agenda.

Jurisdictional Information:

This item is being submitted to Senate in accordance with Senate Bylaw 2; section 4.03(e): "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:

Department approval date (mm/dd/d\yy): 02/16/23
Graduate Studies and Postdoctoral Affairs review date (mm/dd/d\yy): 05/08/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council approval date (mm/dd/yy): 06/12/23

Highlights/Rationale:

The Department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program (CAP) and is thus adding a Doctor of Philosophy (PhD) in Electrical and Computer Engineering – Aeronautics program.

After consultation with the ECE Graduate Studies Committee, which consists of Faculty and Graduate Student representatives, the department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program. Joining the CAP aligns with research that is already being conducted by faculty and graduate students in this area.

Documentation Provided:

Program Revision Template – Appendix A

Graduate Studies Program Revision Template

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

Program: Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Aeronautics

Program contact name(s): Christopher Nielsen, Jared Rank

Form completed by: Christopher Nielsen, Jared Rank

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

The Department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program (CAP) and is thus adding a Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Aeronautics program.

Is this a major modification to the program? Yes

Rationale for change(s):

After consultation with the ECE Graduate Studies Committee, which consists of Faculty and Graduate Student representatives, the department of Electrical and Computer Engineering is joining the Collaborative Aeronautics Program. Joining the CAP aligns with research that is already being conducted by faculty and graduate students in this area.

Proposed effective date: Term: Winter Year: 2024

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-electrical-and-computer-engineering

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	**Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
DOCTOR OF PHILOSOPHY (PHD) IN ELECTRICAL AND COMPUTER ENGINEERING **Graduate research fields** • Antennas, Microwaves and Wave Optics • Biomedical	**DOCTOR OF PHILOSOPHY (PHD) IN ELECTRICAL AND COMPUTER ENGINEERING - AERONAUTICS** ~~**Graduate research fields**~~ ~~• Antennas, Microwaves and Wave Optics~~ ~~• Biomedical~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
• Circuits and Systems Including Computer - Aided Design • Communications and Information Systems • Computer Hardware • Computer Software • Nanotechnology • Pattern Analysis and Machine Intelligence (PAMI) • Power and Energy Systems • Quantum Information • Silicon Devices and Integrated Circuits • Systems and Control • Very Large Scale Integration (VLSI) • Wireless Communication	• ~~Circuits and Systems Including Computer - Aided Design~~ • ~~Communications and Information Systems~~ • ~~Computer Hardware~~ • ~~Computer Software~~ • ~~Nanotechnology~~ • ~~Pattern Analysis and Machine Intelligence (PAMI)~~ • ~~Power and Energy Systems~~ • ~~Quantum Information~~ • ~~Silicon Devices and Integrated Circuits~~ • ~~Systems and Control~~ • ~~Very Large Scale Integration (VLSI)~~ • ~~Wireless Communication~~

Program information
 	
• **Admit term(s)**
  ○ Fall
  ○ Winter
  ○ Spring
 	
• **Delivery mode**
  ○ On-campus
 	
• **Length of program**
  ○ The minimum period of registration for the Doctoral degree is four terms after a Master's degree or equivalent and six terms after an Honours Bachelor's degree or equivalent. The maximum time limit is twelve terms after a Master's degree or equivalent and eighteen terms after an Honours Bachelor's degree or equivalent. Extensions beyond twelve terms must be approved by the Faculty Graduate Studies Office.
 	
• **Program type**
  ○ Doctoral
  ○ Research
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Thesis
	Program information
	
	○ **Admit term(s)**
	  ○ Fall
	  ○ Winter
	  ○ Spring
	
	○ **Delivery mode**
	  ○ On-campus
	
	○ **Length of program**
	  ○ The minimum period of registration for the Doctoral degree is four terms after a Master's degree or equivalent and six terms after an Honours Bachelor's degree or equivalent. The maximum time limit is twelve terms after a Master's degree or equivalent and eighteen terms after an Honours Bachelor's degree or equivalent. Extensions beyond twelve terms must be approved by the Faculty Graduate Studies Office.
	
	○ **Program type**
	  ○ <u>Collaborative</u>
	  ○ Doctoral
	  ○ Research
	
	○ **Registration option(s)**
	  ○ Full-time
	  ○ Part-time
	
	○ **Study option(s)**
	  ○ Thesis

Admission requirements • **Minimum requirements**	**Admission requirements**

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	**Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
○ Admission to the program is based upon the student's academic record and evidence of ability to pursue independent research. ○ Normally an overall standing equivalent to 80% in either a relevant thesis-based Master's degree or a University of Waterloo Master of Engineering (MEng) degree that includes a completed ECE 699 Master of Engineering Project course. ○ At the time of admission, each student must have a faculty supervisor who has endorsed the recommendation for admission. • **Application materials** ○ Résumé ○ Supplementary information form ○ Transcript(s) • **References** ○ Number of references: 3 ○ Type of references: at least 2 academic • **English language proficiency (ELP)** (if applicable) **Degree requirements** ○ **Graduate Academic Integrity Module (Graduate AIM)** ○ **Courses** ○ The coursework associated with the program is intended to provide a foundation for advanced learning in the chosen field of research. A minimum of 4 courses (0.50 unit weight per course) is required for a PhD student holding a MASc degree or equivalent (7 0.50 unit weight courses from a Bachelor program). At least 2 of the courses must be from the list of approved core courses (updated by the Department annually) in one of the approved areas of specialization as specified in the student's letter of admission, unless this course requirement has already been achieved during a University of Waterloo Electrical and Computer Engineering MASc program. The	○ **Minimum requirements** ○ Admission to the program is based upon the student's academic record and evidence of ability to pursue independent research. ○ Normally an overall standing equivalent to 80% in either a relevant thesis-based Master's degree or a University of Waterloo Master of Engineering (MEng) degree that includes a completed ECE 699 Master of Engineering Project course. ○ At the time of admission, each student must have a faculty supervisor who has endorsed the recommendation for admission. ○ **Application materials** ○ Résumé ○ Supplementary information form ○ Transcript(s) ○ **References** ○ Number of references: 3 ○ Type of references: at least 2 academic ○ **English language proficiency (ELP)** (if applicable) **Degree requirements** ○ **Graduate Academic Integrity Module (Graduate AIM)** ○ **Courses** ○ Students admitted to the program with a non-Aeronautics MASc degree must obtain at least 5 courses (0.50 unit weight per course) of graduate credit including 2 Aeronautics core courses. ~~The coursework associated with the program is intended to provide a foundation for advanced learning in the chosen field of research. A minimum of 4 courses (0.50 unit weight per course) is required for a PhD student holding a MASc degree or equivalent (7 0.50 unit weight courses from a Bachelor program). At least 2 courses must be from the list of approved core courses (updated by the Department annually)~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	**Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
remaining 2 courses may be taken from outside of the Department but must be from the faculties of Engineering, Math, and/or Science (unless otherwise approved). All PhD students are required to take a minimum of 2 ECE courses toward their degree requirements. Core courses may count towards this 2 course minimum. The choice of courses must meet with the approval of the supervisor. The faculty supervisor will consider the level and adequacy of each student's preparation in drawing up the candidate's program. It is expected that candidates will maintain a 78% minimum cumulative average in their course work. To obtain credit, an individual course must be passed with at least 75%. ○ Core courses: ▪ Antennas, Microwaves, and Wave Optics ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 671 Microwave and RF Engineering ▪ ECE 672 Optoelectronic Devices ▪ ECE 675 Radiation and Propagation of Electromagnetic Fields ▪ Biomedical ▪ ECE 601 Foundations of Biology in Engineering ▪ ECE 607 Fundamentals of Ultrasonics ▪ ECE 608 Quantitative Methods in Biomedical Engineering ▪ ECE 609 Engineering Analysis of Living Cells ▪ Circuits and Systems ▪ ECE 636 Advanced Analog Integrated Circuits ▪ ECE 637 Digital Integrated Circuits ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 671 Microwave and RF Engineering	~~in one of the approved areas of specialization as specified in the student's letter of admission unless this course requirement has already been achieved during a University of Waterloo Electrical and Computer Engineering MASc program. The remaining 2 courses may be taken from outside of the Department but must be from the faculties of Engineering, Math, and/or Science (unless otherwise approved). All PhD~~ Students are required to take a minimum of 2 ECE courses toward their degree requirements. ~~Core courses may count towards this 2 course minimum.~~ The choice of courses must meet with the approval of the supervisor. ~~The faculty supervisor will consider the level and adequacy of each student's preparation in drawing up the candidate's program. It is expected that candidates will maintain a 78% minimum cumulative average in their course work. To obtain credit, an individual course must be passed with at least 75%.~~ ▪ Aeronautics core courses: ▪ AVIA 601 Interdisciplinary Aeronautics ▪ AVIA 802 Interdisciplinary Aeronautics Project - PhD Level ○ Students admitted to the program with a MASc in Electrical and Computer Engineering - Aeronautics degree from the University of Waterloo must obtain at least 5 courses (0.50 unit weight per course) of graduate credit including 1 Aeronautics core courses. Students are required to take a minimum of 2 ECE courses toward their degree requirements. The choice of courses must meet with the approval of the supervisor. ▪ Aeronautics core course: ▪ AVIA 802 Interdisciplinary Aeronautics Project - PhD Level. ○ Students admitted to the program with an incomplete Master's or Honours Bachelor's degree must obtain at least

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
▪ Communications and Information Systems ▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) ▪ ECE 603 Statistical Signal Processing ▪ ECE 604 Stochastic Processes ▪ ECE 610 Broadband Communication Networks ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 613 Image Processing and Visual Communication ▪ Computer Hardware ▪ ECE 606 Algorithm Design ▪ ECE 621 Computer Organization ▪ ECE 627 Register-transfer-level Digital Systems ▪ ECE 637 Digital Integrated Circuits ▪ Computer Software ▪ ECE 606 Algorithm Design and Analysis or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) or CS 666 Algorithm Design and Analysis ▪ ECE 652 Methods and Principles of Safety-critical Embedded Software ▪ ECE 653 Software Testing, Quality Assurance and Maintenance or CS 647 Software Testing, Quality Assurance, and Maintenance ▪ ECE 654 Software Reliability Engineering	8 courses (0.50 unit weight per course) of graduate credit including 2 Aeronautics core courses. Students are required to take a minimum of 3 ECE courses toward their degree requirements. The choice of courses must meet with the approval of the supervisor. ▪ Aeronautics core courses: ▪ AVIA 601 Interdisciplinary Aeronautics ▪ AVIA 802 Interdisciplinary Aeronautics Project - PhD Level ○ Aside from AVIA 601 & AVIA 802, only courses from the Faculties of Science, Math and Engineering are permitted. ○ This degree is offered through the Collaborative Aeronautics Program. This program, jointly offered by a range of departments/schools across several academic faculties, promotes the development of interdisciplinary perspectives on aeronautics. Collaborative Aeronautics Program students complete their specialist training in their respective home departments/schools, while working with colleagues from a variety of other departments/schools in core interdisciplinary courses (AVIA 601 and AVIA 602/802). ○ To obtain credit, an individual course must be passed with at least a 75% average. ○ Students may be required to withdraw from the program at any time if they fail to maintain a minimum cumulative average of 78% in their course work or if they fail to receive satisfactory progress reports regarding their research activities. ~~○ ECE core courses:~~ ~~▪ Antennas, Microwaves, and Wave Optics~~ ~~▪ ECE 642 Radio Frequency Integrated Circuit Design~~ ~~▪ ECE 671 Microwave and RF Engineering~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
▪ ECE 656 Database Systems ▪ ECE 657A Data and Knowledge Modelling and Analysis or CS 680 Introduction to Machine Learning or CS 686 Introduction to Artificial Intelligence ▪ CO 685 The Mathematics of Public-Key Cryptography or CS 658 Computer Security and Privacy or CO 687 Applied Cryptography ▪ Nanotechnology ▪ ECE 630 Physics and Models of Semiconductor Devices ▪ ECE 633 Nanoelectronics ▪ ECE 634 Organic Electronics ▪ ECE 635 Fabrication in the Nanoscale: Principles, Technology and Applications ▪ ECE 672 Optoelectronic Devices ▪ PAMI - Pattern Analysis and Machine Intelligence ▪ ECE 606 Algorithm Design and Analysis ▪ ECE 613 Image Processing and Visual Communication ▪ ECE 657 Tools of Intelligent Systems Design ▪ ECE 657A Data and Knowledge Modelling and Analysis ▪ ECE 659 Intelligent Sensors and Sensor Networks ▪ Power and Energy Systems ▪ ECE 662 Power Systems Analysis and Control ▪ ECE 663 Energy Processing ▪ ECE 665 High Voltage Engineering Applications	~~▪ ECE 672 Optoelectronic Devices~~ ~~▪ ECE 675 Radiation and Propagation of Electromagnetic Fields~~ ~~▪ Biomedical~~ ~~▪ ECE 601 Foundations of Biology in Engineering~~ ~~▪ ECE 607 Fundamentals of Ultrasonics~~ ~~▪ ECE 608 Quantitative Methods in Biomedical Engineering~~ ~~▪ ECE 609 Engineering Analysis of Living Cells~~ ~~▪ Circuits and Systems~~ ~~▪ ECE 636 Advanced Analog Integrated Circuits~~ ~~▪ ECE 637 Digital Integrated Circuits~~ ~~▪ ECE 642 Radio Frequency Integrated Circuit Design~~ ~~▪ ECE 671 Microwave and RF Engineering~~ ~~▪ Communications and Information Systems~~ ~~▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795)~~ ~~▪ ECE 603 Statistical Signal Processing~~ ~~▪ ECE 604 Stochastic Processes~~ ~~▪ ECE 610 Broadband Communication Networks~~ ~~▪ ECE 611 Digital Communications~~ ~~▪ ECE 612 Information Theory~~ ~~▪ ECE 613 Image Processing and Visual Communication~~ ~~▪ Computer Hardware~~ ~~▪ ECE 606 Algorithm Design~~ ~~▪ ECE 621 Computer Organization~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	**Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content**:
▪ ECE 666 Power Systems Operation ▪ ECE 668 Distribution System Engineering ▪ ECE 760 Special Topics in Power Systems and High Voltage Engineering (topic 11 Power System Protection and Relaying) or ECE 765 Power System Protection and Relaying ▪ Quantum Information ▪ ECE 676 Quantum Information Processing Devices (cross-listed with QIC 750) ▪ ECE 677 Quantum Electronics and Photonics (cross-listed with QIC 885) ▪ QIC 710 Quantum Information Processing ▪ Silicon Devices and Integrated Circuits ▪ ECE 630 Physics and Models of Semiconductor Devices ▪ ECE 631 Microelectronic Processing Technology ▪ ECE 634 Organic Electronics ▪ ECE 636 Advanced Analog Integrated Circuits ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 672 Optoelectronic Devices ▪ Systems and Controls ▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) ▪ ECE 604 Stochastic Processes ▪ ECE 682 Multivariable Control Systems	~~▪ ECE 627 Register-transfer-level Digital Systems~~ ~~▪ ECE 637 Digital Integrated Circuits~~ ~~▪ Computer Software~~ ~~▪ ECE 606 Algorithm Design and Analysis or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) or CS 666 Algorithm Design and Analysis~~ ~~▪ ECE 652 Methods and Principles of Safety-critical Embedded Software~~ ~~▪ ECE 653 Software Testing, Quality Assurance and Maintenance or CS 647 Software Testing, Quality Assurance, and Maintenance~~ ~~▪ ECE 654 Software Reliability Engineering~~ ~~▪ ECE 656 Database Systems~~ ~~▪ ECE 657A Data and Knowledge Modelling and Analysis or CS 680 Introduction to Machine Learning or CS 686 Introduction to Artificial Intelligence~~ ~~▪ CO 685 The Mathematics of Public-Key Cryptography or CS 658 Computer Security and Privacy or CO 687 Applied Cryptography~~ ~~▪ Nanotechnology~~ ~~▪ ECE 630 Physics and Models of Semiconductor Devices~~ ~~▪ ECE 633 Nanoelectronics~~ ~~▪ ECE 634 Organic Electronics~~ ~~▪ ECE 635 Fabrication in the Nanoscale: Principles, Technology and Applications~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
▪ ECE 686 Filtering and Control of Stochastic Linear Systems ▪ ECE 688 Nonlinear Systems ▪ VLSI - Very Large Scale Integration ▪ ECE 636 Advanced Analog Integrated Circuits ▪ ECE 637 Digital Integrated Circuits ▪ ECE 642 Radio Frequency Integrated Circuit Design ▪ ECE 671 Microwave and RF Engineering ▪ Wireless Communication ▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795) ▪ ECE 603 Statistical Signal Processing ▪ ECE 604 Stochastic Processes ▪ ECE 610 Broadband Communication Networks ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 613 Image Processing and Visual Communication ○ **PhD Comprehensive Examination I and PhD Comprehensive Examination II** ○ Students are required to meet the University-level PhD Comprehensive Examination minimum requirements outlined in the “Minimum requirements for the PhD degree” section of the Graduate Studies Academic Calendar (GSAC), with certain noted differences that are specific to the Faculty of Engineering Comprehensive Examination minimum requirements: ▪ Comprehensive examination purpose: Consistent with	~~▪ ECE 672 Optoelectronic Devices~~ ~~▪ PAMI - Pattern Analysis and Machine Intelligence~~ ~~▪ ECE 606 Algorithm Design and Analysis~~ ~~▪ ECE 613 Image Processing and Visual Communication~~ ~~▪ ECE 657 Tools of Intelligent Systems Design~~ ~~▪ ECE 657A Data and Knowledge Modelling and Analysis~~ ~~▪ ECE 659 Intelligent Sensors and Sensor Networks~~ ~~▪ Power and Energy Systems~~ ~~▪ ECE 662 Power Systems Analysis and Control~~ ~~▪ ECE 663 Energy Processing~~ ~~▪ ECE 665 High Voltage Engineering Applications~~ ~~▪ ECE 666 Power Systems Operation~~ ~~▪ ECE 668 Distribution System Engineering~~ ~~▪ ECE 760 Special Topics in Power Systems and High Voltage Engineering (topic 11 Power System Protection and Relaying) or ECE 765 Power System Protection and Relaying~~ ~~▪ Quantum Information~~ ~~▪ ECE 676 Quantum Information Processing Devices (cross-listed with QIC 750)~~ ~~▪ ECE 677 Quantum Electronics and Photonics (cross-listed with QIC 885)~~ ~~▪ QIC 710 Quantum Information Processing~~ ~~▪ Silicon Devices and Integrated Circuits~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
University-level minimum requirements. ▪ Who Chairs an examination: Students must follow the Faculty of Engineering Chair guidelines whereby the Chair is normally selected from outside of the student's home department. ▪ Format / Content: Consistent with University-level minimum requirements but with additional information provided in the Faculty of Engineering Comprehensive Examination minimum requirements. ▪ Academic integrity: Consistent with University-level minimum requirements. ○ In addition to the University-level and Faculty-level PhD Comprehensive Examination minimum requirements, students in the PhD in Electrical and Computer Engineering program are also required to meet the following requirements: ▪ Students must complete the Background Comprehensive Examination and the Comprehensive Proposal Examination which are conducted by the Department for each candidate. ▪ The first exam, the Background Comprehensive Examination, will be held before the end of the third term (fourth term if from an incomplete MASc). The main objective of this examination is to satisfy the Department that the candidate has a broad knowledge of their field and a thorough technical background to pursue their research; the candidate will be questioned on their background preparation. ▪ The second exam, the Comprehensive Proposal Examination, will be held no later than the student's sixth term and only after the Background Comprehensive Examination has been	~~▪ ECE 630 Physics and Models of Semiconductor Devices~~ ~~▪ ECE 631 Microelectronic Processing Technology~~ ~~▪ ECE 634 Organic Electronics~~ ~~▪ ECE 636 Advanced Analog Integrated Circuits~~ ~~▪ ECE 642 Radio Frequency Integrated Circuit Design~~ ~~▪ ECE 672 Optoelectronic Devices~~ ~~▪ Systems and Controls~~ ~~▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795)~~ ~~▪ ECE 604 Stochastic Processes~~ ~~▪ ECE 682 Multivariable Control Systems~~ ~~▪ ECE 686 Filtering and Control of Stochastic Linear Systems~~ ~~▪ ECE 688 Nonlinear Systems~~ ~~▪ VLSI - Very Large Scale Integration~~ ~~▪ ECE 636 Advanced Analog Integrated Circuits~~ ~~▪ ECE 637 Digital Integrated Circuits~~ ~~▪ ECE 642 Radio Frequency Integrated Circuit Design~~ ~~▪ ECE 671 Microwave and RF Engineering~~ ~~▪ Wireless Communication~~ ~~▪ ECE 602 Introduction to Optimization or CO 602 Fundamentals of Optimization (cross-listed with CM 740 and CS 795)~~ ~~▪ ECE 603 Statistical Signal Processing~~ ~~▪ ECE 604 Stochastic Processes~~

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
successfully completed. The main objective of this examination is to examine and approve the thesis proposal. ▪ The result of these examinations is the identification of an Advisory Committee which has examined and approved the candidate's background and thesis proposal and is willing to assist the supervisor with the subsequent research program. The validity of the comprehensive examination expires after three years. ▪ Students who do not complete either Comprehensive Examination by the stated deadline, or fail either exam on their second attempt, will be required to withdraw from the program. ▪ The Background Comprehensive Examination Committee does not include the supervisor(s) and must consist of three members of the University, one of whom must be from ECE and two of whom can be internal or external to ECE (but within the University of Waterloo). The Proposal Comprehensive Examination Committee must consist of the supervisor(s) plus three members of the University, two of whom must be from ECE and one of whom must be external to ECE (but within the University of Waterloo). It is the supervisor's responsibility to form each of these committees. ○ Detailed procedures are available in the "PhD comprehensive examination process" section of the Electrical and Computer Engineering website. ○ **PhD Seminar** ○ The aim of the seminar is to allow students to gain experience in preparing and presenting their work. The seminar is to be held no later than the end of the third year (ninth term)	▪ ~~ECE 610 Broadband Communication Networks~~ ▪ ~~ECE 611 Digital Communications~~ ▪ ~~ECE 612 Information Theory~~ ▪ ~~ECE 613 Image Processing and Visual Communication~~ ○ **PhD Comprehensive Examination I and PhD Comprehensive Examination II** ○ Students are required to meet the University-level PhD Comprehensive Examination minimum requirements outlined in the "Minimum requirements for the PhD degree" section of the Graduate Studies Academic Calendar (GSAC), with certain noted differences that are specific to the Faculty of Engineering Comprehensive Examination minimum requirements: ▪ Comprehensive examination purpose: Consistent with University-level minimum requirements. ▪ Who Chairs an examination: Students must follow the Faculty of Engineering Chair guidelines whereby the Chair is normally selected from outside of the student's home department. ▪ Format / Content: Consistent with University-level minimum requirements but with additional information provided in the Faculty of Engineering Comprehensive Examination minimum requirements. ▪ Academic integrity: Consistent with University-level minimum requirements. ○ In addition to the University-level and Faculty-level PhD Comprehensive Examination minimum requirements, students in the PhD in Electrical and Computer Engineering - Aeronautics program are also required to meet the following requirements: ▪ Students must complete the Background Comprehensive Examination and the

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
after the initial registration in the program. The seminar must be attended by the student's supervisor and their Advisory Committee. Other Faculty members and PhD and MASc students may also be in attendance. Since this is not intended to be an examination, the seminar presentation and the feedback communication, would be regarded as satisfying the seminar credit requirements. ○ Students who do not complete the PhD Seminar by the stated deadline will be required to withdraw from the program. ○ **PhD Thesis** ○ The primary objective of the program is the accomplishment of independent and original research work and reporting thereon in a research thesis. ○ The requirements for the PhD degree are completed when the student successfully defends their thesis before an Examination Committee. This committee should consist of the supervisor, three other members of the University (at least one of whom should be from outside the Department) and an external examiner. Faculty from other Departments who hold cross appointments in the Department are counted as departmental members in defining examining committees.	Comprehensive Proposal Examination which are conducted by the Department for each candidate. ▪ The first exam, the Background Comprehensive Examination, will be held before the end of the third term (fourth term if from an incomplete MASc). The main objective of this examination is to satisfy the Department that the candidate has a broad knowledge of their field and a thorough technical background to pursue their research; the candidate will be questioned on their background preparation. ▪ The second exam, the Comprehensive Proposal Examination, will be held no later than the student's sixth term and only after the Background Comprehensive Examination has been successfully completed. The main objective of this examination is to examine and approve the thesis proposal. ▪ The result of these examinations is the identification of an Advisory Committee which has examined and approved the candidate's background and thesis proposal and is willing to assist the supervisor with the subsequent research program. The validity of the comprehensive examination expires after three years. ▪ Students who do not complete either Comprehensive Examination by the stated deadline, or fail either exam on their second attempt, will be required to withdraw from the program. ▪ The Background Comprehensive Examination Committee does not include the supervisor(s) and must consist of three members of the University, one of whom must

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
	be from ECE and two of whom can be internal or external to ECE (but within the University of Waterloo). The Proposal Comprehensive Examination Committee must consist of the supervisor(s) plus three members of the University, two of whom must be from ECE and one of whom must be external to ECE (but within the University of Waterloo). It is the supervisor's responsibility to form each of these committees. ○ Detailed procedures are available in the "PhD comprehensive examination process" section of the Electrical and Computer Engineering website. ○ **PhD Seminar** ○ The aim of the seminar is to allow students to gain experience in preparing and presenting their work. The seminar is to be held no later than the end of the third year (ninth term) after the initial registration in the program. The seminar must be attended by the student's supervisor and their Advisory Committee. Other Faculty members and PhD and MASc students may also be in attendance. Since this is not intended to be an examination, the seminar presentation and the feedback communication, would be regarded as satisfying the seminar credit requirements. ○ Students who do not complete the PhD Seminar by the stated deadline will be required to withdraw from the program. ○ **PhD Thesis** ○ The primary objective of the program is the accomplishment of independent and original research work and reporting thereon in a research thesis. ○ The requirements for the PhD degree are completed when the student successfully defends their thesis before an Examination Committee. This committee should consist of the supervisor, three other members of the University (at least one of whom should be from outside the Department) and an external examiner. Faculty from

Current PhD in Electrical and Computer Graduate Studies Academic Calendar content:	Proposed PhD in Electrical and Computer Engineering - Aeronautics Graduate Studies Academic Calendar content:
	other Departments who hold cross appointments in the Department are counted as departmental members in defining examining committees.

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

Current students will be permitted to change program to the Collaborative Aeronautics Program.

Department/School approval date (mm/dd/yy): 02/16/2023
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 05/08/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

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Return to Agenda

Senate Graduate and Research Council

For Approval **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	Charmaine Dean Vice-President, Research & International
Sponsor: **Contact Information:**	Jeff Casello Associate Vice-President, Graduate Studies and Postdoctoral Affairs
Presenter: **Contact Info:**	Jeff Casello jcasello@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**9d. Report – Senate Graduate & Research Council: Graduate Studies Academic Calendar (GSAC) changes**

Recommendation/Motion:

To approve the proposed revisions to the Graduate Studies Academic Calendar (GSAC), effective 1 September 2023, as presented.

Summary:

Senate Graduate & Research Council met on 12 June 2023 and agreed to forward the following item to Senate for approval as part of the Regular agenda.

Jurisdictional Information:

This item is being submitted to Senate in accordance with Senate Bylaw 2; section 4.03(e): "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:

GradOps review date (mm/dd/d\yy): 04/18/26
GradWIL Steering Committee review date: 05/08/23
Senate Graduate & Research Council approval date (mm/dd/yy): 06/12/23

Highlights/Rationale:

The following changes are proposed: Updating and expanding the co-operative education section to include Graduate Work-integrated Learning definitions and content; and adding a new Community and Industry Research Projects (CIR) course component to the GSAC and Quest glossary of terms.

The University's strategic commitment towards developing talent for a complex future includes expanding Work Integrated Learning (WIL) opportunities at the graduate level. This is a signature objective towards the goal of enhancing graduate studies. Within this "GradWIL" initiative, an identified challenge is in tracking where and how graduate WIL activities takes place. That is, currently, there is inconsistency in terminology as well as how similar activities are recorded across graduate programs. The purpose of this Calendar language is to provide structure and consistency for how programs label/record their WIL offerings such that this information can be tracked institutionally (or by individual programs). The proposed Calendar language also identifies other forms of WIL beyond the current description, which only identifies co-operative education. Consultations, which included this proposed structure, have been ongoing (involving Faculty graduate groups, graduate students, CEE leaders, GSPA, RO, individual graduate programs, etc.).

Proposed Changes:

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

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/co-operative-education

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/glossary-terms

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
~~**Co-operative education**~~ ~~Some departments within the University make provision for co-operative work terms at the Master's or the PhD level. Normally, two terms of co-op work terms are required for this option. Students admitted to co-operative degree programs register part-time for their work terms. Check with your department/school to see whether the co-op option is available.~~	**Graduate Work-integrated Learning** Work-integrated learning (WIL) opportunities are provided to students across numerous graduate programs at the University of Waterloo. Adopting the Co-operative Education and Work-Integrated Learning Canada (CEWIL) definition, WIL "is a form of curricular experiential education that formally integrates a student's academic studies with quality experiences within a workplace or practice setting. WIL experiences include an engaged partnership of at least: an academic institution, a host organization, and a student. WIL can occur at the course or program level and includes the development of student learning objectives and outcomes related to:

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	employability, agency, knowledge and skill mobility and life-long learning." WIL allows for theoretical learning to be integrated with practice, promoting deeper understanding of theory through practical application. Graduate programs offering WIL opportunities should follow best-practices through the inclusion of the following key WIL components: pedagogy (curricular elements that include when the activity occurs, duration/intensity, and training); experience (ensuring meaningful activities and alignment with the WIL definition); assessment (of activities based on identified learning outcomes); and reflection (on what constitutes purposeful work for each student). Regardless of how WIL is structured, activities should align with Graduate WIL (GradWIL) learning development process. *(See below for GradWIL learning development process text, included for reference).* At the University of Waterloo, there are different WIL models that provide consistency in how WIL experiences are offered and recorded across academic programs. While there may be some WIL activities that do not fall within one of the models (as well as accreditation requirements for professional programs), academic units should use one of the following WIL models to facilitate standardization and institutional tracking of experiences. 1. **Course-level WIL** is delivered in the context of a course (either required or elective) and activities are typically facilitated through a course instructor. Students receive course credit for the activity, with the unit weight being determined by the intensity/duration of activities. Course-level WIL comes in the form of the following models: a) Community and Industry Research Projects (CIR) or b) Practicums:[1] a) **Community and Industry Research Projects (CIR):** Supporting the course

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	objectives, CIR consist of a project or assignment within the course wherein students engage with a partner organization either individually or in teams. The course project/assignment would occur in or with external organizations, with examples being consulting projects, design projects, program evaluations. When a course involves CIR, the activity would be identified with a secondary (or tertiary) component using the course component CIR. b) **Practicums (PRA)**: Practicums are a work-integrated learning experience that form the basis of the course and provide students with intensive, hands-on experience in a setting relevant to their subject of study (paid or unpaid). Practicums are typically supervised within the external setting by identified person(s) who are approved by the program (based on their professional and other competencies). Practicum hour requirements are established by the program, vary across different programs and courses. Practicums are denoted as a primary component using the course component PRA. Practicums are usually graded as credit/no-credit. 2. **Program-level WIL** is delivered as a required component of the program with associated WIL activities typically facilitated through the academic unit, often in partnership with Co-operative and Experiential Education (CEE). Program-level WIL comes in the form of the following models: a) Co-operative Education or b) Internship. Program-level WIL would be identified through the program name, plan code, and corresponding milestone(s). In both models, the WIL activity provides experience in a practice/workplace setting related to the student's field of study. Typically the WIL activity would occur at a time in the

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	student's academic program to allow for an integration of learning between the WIL experience and academic/research activities. As program-level WIL typically involves full-time activity, students would be required to have a change of enrollment status during their experience(s). a) **Co-operative Education (Co-op)**: Co-op is full-time, paid work experience in a workplace setting that is related to the student's area of study and career interest. Co-op programs typically include completion of a professional development course prior to a work term (COOP 601[2]), work term(s), and reflective and/or work reports as required by the graduate program. In masters-level programs with co-op designations, students are required to successfully complete a minimum of one standard work-term and, if specified by their program, one additional work term (standard or flexible work-terms). Co-op doctoral programs require a minimum of three standard work-terms and, if specified by their program, additional work terms (standard or flexible work-terms). b) **Internships**: Internships are supervised work-integrated learning experiences that are discipline-specific and directly align with the graduate program's learning outcomes. Internships require approval by the graduate program. Internships vary in length and intensity, but are typically between 4 months to 12 months of full-time work experience (that is paid or unpaid), and supervised within the external setting by identified persons who are approved by the graduate program (based on their professional and other competencies).

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	Separate from course or program-level offerings, many graduate students are involved in discipline-specific research activities that constitute WIL either as part of degree requirements (e.g., thesis or Master's Research Paper) or as additional research projects during their graduate training (i.e., during a time when they have active enrollment status). Such research would involve an industry or community partner and an identified faculty collaborator (in most cases, the research supervisor). For research activities to be considered WIL, there must be co-creation of the research objectives by the external partner and the student/faculty member, active engagement and interaction between the student and external partner, and the external partner should have a role in providing feedback to and/or assessment of the student activity. [1] There are other types of experiential learning courses that take place in a setting outside the classroom [e.g., Labs (LAB), Field Studies (FLD), Studio (STU)]. The key distinction between these types of courses and those that denote WIL is that, for the former, a meaningful partnership with an external/host organization is not required. If criteria for WIL is met, courses should be identified as CIR or PRA. [2] COOP 601 does not count towards home program degree course requirements.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
Glossary of terms **N/A**	Glossary of terms **Community and Industry Research Projects (CIR)**: This is a secondary or tertiary component that involves student engagement in research that occurs primarily in or with external organizations (including consulting projects, design projects, program evaluations). This component is only used at the graduate-level.

Additional information:

The content below will *not* be added to the GSAC but will be included on a separate GradWIL resource page. It is included here because it is referenced within the proposed calendar text.

GradWIL Learning Development Process

GradWIL Learning Development Process has been designed to help guide how WIL is offered at the University of Waterloo, such that learning outcomes (i.e., based on program-specific graduate degree level expectations and/or future ready talent framework) can be supported. This learning development process is provided to help shape decision-making, and, as a collective, create the conditions for purposeful work.

Prior to their experience students will have had the opportunity to:

- **Evaluate** the level of their current knowledge, skills, and abilities
- **Reflect** on their values, needs and the strengths/gaps in their current knowledge, skills, and abilities
- **Plan** how to utilize strengths and improve upon gaps in knowledge, skills, and abilities while on an experience

While on experience students will have had the opportunity to:

- **Develop** and/or **implement** research, evidence-informed solutions and/or other work reflecting their depth and breadth of discipline and context specific knowledge
- **Collaborate** and **build** professional relationships with industry and/or community partners
- **Reflect** on their current work experience, demonstrating evolution in their knowledge, skills, and abilities, a deeper understanding of their values and needs, and an appreciation for differences in workplace cultures

Following their experience students will have had the opportunity to:

- **Illustrate** how their values, knowledge, skills and abilities are connected to their career identity (i.e. overall career goals, interests, and motivations)
- **Reflect** on how their career identity can contribute to academia, government, and/or private and public sectors to impact people, teams, organizations, and communities
- **Integrate** their career identity, experiences, and competencies into a post-graduation action plan

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Senate Undergraduate Council

For Approval **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Presenter: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**10a. Report - Senate Undergraduate Council:** **Academic Plan Change – Diploma in Studies in Islam**

Recommendation/Motion:
To approve the proposed academic plan revisions to the Diploma in Studies in Islam, for the Faculty of Arts, effective 1 September 2024, as presented.

Summary:
Senate Undergraduate Council met on June 20, 2023 and agreed to forward the following items to Senate for approval as part of the regular agenda.

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:
Renison Academic Council approval date (mm/dd/yy): 02/03/23
Senate Undergraduate Council approval date (mm/dd/yy): 06/20/23

Background and Rationale:
The proposed updates to the diploma are to match the current regulations for diplomas, and updating the title to current language. The four courses included in the updated diploma encourage students to develop a comprehensive understanding of Islamic and Arab cultures, and offer them the opportunity to select any other SI courses of interest. Diploma students are not tracked by the system before they submit an intent to graduate form so there are no students to consult about the proposed name and content changes.

Proposed Changes:
Current calendar text: http://ugradcalendar.uwaterloo.ca/page/ARTS-Diploma-in-Studies-in-Islam1

Proposed calendar text: (underlined and bolded = new, strikethrough = deletion)

Plan title: Diploma in Studies in Islam**ic and Arab Cultures**
Students enrolled in any **degree program or** non- or post-degree academic plan may pursue the Diploma in Studies in Islam**ic and Arab Cultures.**

~~This program is housed at and administered by Renison University College~~.

The Diploma in Studies in Islam**ic and Arab Cultures** requires successful completion of a minimum of **two academic units (four courses)** ~~four academic course units (eight courses)~~ with a minimum cumulative diploma average of 65%, including:

- **SI 121R**
- **SI 131R**
- **Any two additional SI courses**
- ~~SI 121R, SI 221R/RS 221, SI 390R~~
- ~~one of SI 250R/MEDVL 250R, SI 251R/MEDVL 251R~~
- ~~remaining courses (to a total of eight) from the balance of courses above and the following courses:~~
    - ~~Faculty of Arts courses: any additional SI course, ANTH 311/RS 361, ANTH 350/GSJ 350, FINE 214,~~
- ~~HIST 115/MEDVL 115, HIST 230, HIST 260/MEDVL 260, MUSIC 232, MUSIC 233, PACS 326/RS 380,~~
- ~~PSCI 252, PSCI 257, PSYCH 349R, RS 110, RS 216, RS 284/GSJ 261, RS 312, RS 325/GSJ 320, SDS~~
- ~~240R, SOC 253/HLTH 253~~
    - ~~Faculty of Environment courses: ERS 404/PSCI 432, GEOG 101, GEOG 203, INDEV 100, INDEV~~
- ~~300/PHIL 227~~
    - ~~Faculty of Mathematics course: CO 480~~

Course list
SI 121R – Islam in the World
SI 131R – Arab Culture

Senate Undergraduate Council

For Approval **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Presenter: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**10b. Report - Senate Undergraduate Council: New Academic Plans - Diploma in Restorative Justice & Restorative Justice Specialization**

Recommendation/Motion:
To approve the proposed new academic plans, Diploma in Restorative Justice, and Restorative Justice Specialization, for the Faculty of Arts, effective 1 September 2024, as presented.

Summary:
Senate Undergraduate Council met on June 20, 2023 and agreed to forward the following items to Senate for approval as part of the regular agenda.

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:
PACS Administrative Group, Conrad Grebel University College approval date (mm/dd/yy): 02/10/23
College Council, Conrad Grebel University College approval date (mm/dd/yy): 03/03/23
Senate Undergraduate Council approval date (mm/dd/yy): 06/20/23

Background and Rationale:
Restorative justice as a philosophy "emphasizes healing and accountability to repair harm and injury, build healthy relationships, and create thriving communities" (McCants-Turner 2022, 250). Restorative justice is often distinguished in conflict resolution from retributive justice (focused on punishment for wrongdoing), distributive justice (focused on equality or fairness of outcomes), and procedural justice (focused on fair treatment) (e.g. Deutsch 2011). Restorative justice philosophies are evident in multiple traditions that foreground interconnectedness, communal well-being and healing. Notably this includes Indigenous worldviews and philosophies of justice shaped by an emphasis on respect, restoring balance and healing relationships; some examples from Canada include Cree, Anishinabek, Mi'kmaq, Haudenosaunee and Inuit traditional approaches to justice (Monchalin 2016). Restorative justice philosophies also appear in religious

traditions such as Christianity, Judaism and Islam (e.g. Hadley 2001, Zehr 2002). The goal of restorative justice is to enable those who are experiencing harm, violence, or injustice to exercise agency in transforming relationships and pursuing solutions that yield equitable, durable, sustainable outcomes, and flourishing communities.

Scholarship, research, and practice in restorative justice have deepened and broadened in the past decade. Applications range from restorative justice in education to criminal accountability, to workplace harms, to addressing larger systems of racism, white supremacy, sexism, homophobia, slavery and colonialism, as well as other areas of harmful human interaction. Scholars and practitioners are exploring restorative justice in relation to Indigenous worldviews as well as other traditions. The expansion means this area now warrants its own specialization within Peace and Conflict Studies. Key principles that serve as the bedrock of the study of restorative justice, which elevate principles of Peace and Conflict Studies more generally, include:

- Focus on harms and needs. Restorative justice focuses primarily on addressing harms – whether caused systemically or interpersonally – and on the steps needed to restore those injured.
- Focus on healing. Responses to harms emphasize healing for individuals and communities.
- Accountability. Successful applications of restorative justice rely on active, participatory processes that support accountability. Participants accept responsibility for their own actions as individuals and/or as members of communities that may harm or heal.
- Interconnectedness. Disputes, harms, or injustices are understood to exist within broader economic and political contexts that affect individuals and communities. Further, people live within networks of care and relationships that are central to individual and communal health and well-being. Restorative approaches recognize and respond to this interconnectedness.
- Value of everyone. Everyone has value, dignity and is worthy of respect, no matter what they have done or been complicit in enabling or how they have been harmed.

The proposed Specialization and Diploma grow out of longstanding interest in restorative justice within Peace and Conflict Studies (PACS) spanning several decades. Restorative justice is not a new concept and is integral to the mission of the PACS program. Some foundations and historical developments over the years that this Specialization and Diploma builds upon include:

- Principles of restorative justice taught regularly in PACS courses;
- Courses that focus on restorative justice (PACS 329 Restorative Justice; PACS 314 Restorative Justice and Transformative Education);
- Pioneering work in restorative justice supported by the Conflict Resolution Network Canada, once housed at Grebel until it closed operations in 2008;
- The Certificate Program in Conflict Management, managed by PACS, which has partnered with local agencies that operate restorative justice training and mediation programs for many years, and offers a variety of workshops with a clear restorative justice theme (e.g. Transformative Mediation, Facilitated Dialogue Training: Restorative Options to Address Sexual Harm); and
- Explorations from a 2018-2020 cross-campus Restorative Justice Working Group at UWaterloo, led by PACS staff, which explored ways to apply a restorative justice framework to pedagogy, policy, and student life more broadly.

While the theory and framework of restorative justice fits squarely within the theoretical and applied framework of peace that PACS offers, restorative justice is an area of interest to colleagues in other departments and faculties. This calls for interdisciplinary study opportunities within the Specialization and Diploma, and direct collaboration with the Indigenous Studies minor at the University of Waterloo.

This proposal was shaped in consultation with many colleagues at the University of Waterloo and in the community. This includes colleagues who participated in the Restorative justice Working Group, PACS instructors who work in restorative justice, colleagues from Black Studies and Indigenous Studies, the Office of Indigenous Relations, as well as colleagues who work in community-based organizations related to restorative justice, notably Ahwenehaode Indigenous Justice Program based out of Waterloo Region Community Legal Services. Input from these consultations shaped a field-leading proposal.

Conrad Grebel University College, which administers the PACS program for the University of Waterloo, is also supportive of the proposed Specialization and Diploma in Restorative Justice. They are consistent with the Mission of Grebel "to pursue justice and peace in service to church and society," and with two of the institution's 12 core values: "active peacemaking" and "responsible citizenship."

University students informally polled about their potential interest in a Restorative Justice Specialization or Diploma have expressed a great deal of excitement for it. In PACS 101 Peace is Everyone's Business, one-third of the students (of the 35 students enrolled in Fall 2019) indicated interest in pursuing a restorative justice plan after a class session on the topic. PACS 202/LS 271 Conflict Resolution, a PACS course which annually enrolls over 500 students, contains a significant module on restorative justice and regularly triggers a great deal of class discussion and interest in further studies in the topic. PACS 329/LS 344 Restorative Justice is regularly oversubscribed, and students often request further studies to enable them to go deeper into restorative justice principles and obtain a credential documenting this study area. In an informal survey of students who recently took PACS 329/LS 344, 11 of 15 respondents said that they would have a strong interest in adding a Diploma or Specialization in Restorative Justice if it was available. The PACS program therefore believes that there will be strong student interest in the Diploma or Specialization in Restorative Justice from within the Faculty of Arts and from students in other disciplines who seek a career in a field involving significant human interaction and constructive responses to harms and conflict. Furthermore, many students at UW take courses peripherally connected to restorative justice and remain in silos or disconnected from a restorative justice community after taking the course. This program will allow students to be part of an intentional community, where they could build on a shared ethos and culture to further their restorative justice praxis.

Further Details:
Unique program: There are no other plans in restorative justice offered at the University of Waterloo. Several academic units offer isolated courses related to the field of restorative justice, many of which are listed in the Specialization as electives, and are part of other plans.

Students completing a major in PACS can choose a Specialization in Restorative Justice to highlight the coursework they have completed in Restorative justice as part of their course of study.

Students completing another degree can choose to complete a Diploma in Restorative Justice as part of their studies with requirements designed to avoid undue overlap or double counting as students pursue their specific academic interests.

We were unable to identify any similar undergraduate programs or diplomas in Restorative Justice located at an Ontario university. Most closely related are two programs: Fleming College offers a Restorative Practices and Alternative Dispute Resolution Graduate Program, and Durham College includes restorative justice content as part of a dispute resolution program. This would place Waterloo squarely in an emerging market offering a high quality program that no other institution in Ontario is currently offering.

Documentation Provided:
- Appendix A: Restorative Justice Specialization
- Appendix B: Diploma in Restorative Justice

APPENDIX A

Restorative Justice Specialization

Rationale:
The Specialization in Restorative Justice will educate students to understand an innovative approach to peace and justice that transforms the relationships of those impacted and harmed by conflict, violence or injustice – be it at an individual, familial, workplace, community, or societal level. The Specialization will enable students to analyze the ways systems and institutions cause harm and can be transformed, as well as articulate a vision for justice that can heal individuals and communities. It will also equip students to apply restorative justice philosophies and practices in a variety of contexts. The Specialization in Restorative Justice will be informed by anti-racist and decolonial lenses that foreground the importance of addressing the harms, abuses and violence caused by racism, colonialism and other systems of oppression, making this an integral part of required courses. In addition, students in the Restorative Justice Specialization will be required to take at least one Indigenous Studies course that explores Indigenous perspectives on justice, harm and/or healing as part of the program given the importance of these perspectives in shaping the field. The specialization will help advance the goals of the Truth and Reconciliation Commission's (TRC) calls to action and the University of Waterloo's commitments to decolonization. In particular, it responds to the spirit of TRC Call to Action 28, which calls upon law schools to include a course on Aboriginal people and the law, the history and legacy of residential schools, historical harms, treaty relations as well as building skills in intercultural competency, human rights, conflict resolution, and anti-racism. It also responds to the spirit of Call to Action 63.iii to education leaders for building student capacity for intercultural understanding, empathy and mutual respect. Instructors teaching courses included in the Specialization in Restorative Justice will be invited to participate in a pedagogy community of practice hosted by PACS, which will explore ways in which restorative justice philosophy and anti-racist and decolonial lenses relate to and inform pedagogical approaches and principles of restorative justice. Students who complete the Specialization will be able to:

- Explain restorative justice philosophy, its historical roots, and aspects of its interdisciplinary scholarship.
- Critically reflect on restorative justice practices and ethics.
- Apply anti-racist and decolonial lenses to understand how power interacts with systems of oppression in relation to harms and violence as well as restorative justice practices and agency.
- Demonstrate skills in applying aspects of restorative justice philosophy and practice in their life, field studies, and/or professional work.

The Restorative Justice Specialization cannot be combined with the Diploma in Restorative Justice.

Proposed Calendar Text:

The Restorative Justice Specialization is open to all students majoring in Peace and Conflict Studies.

The Restorative Justice Specialization requires successful completion of six courses:

- PACS 202/LS 271: Conflict Resolution
- PACS 329/LS 344: Restorative Justice
- PACS 331: Trauma, Healing, and Social Transformation
- One of:
    - INDG 201/CDNST 201: The Indigenous Experience in Canada
    - INDG 272/ANTH 272: Issues in Contemporary Indigenous Communities in Canada
    - INDG 228/PSCI 228: Introduction to Indigenous Political Thought
- Two additional courses, one of which must be at the 300-level or above, from:
    - PACS 314: Restorative Justice and Transformative Education

- PACS 318: Peacebuilding in Divided Societies
- BLKST 103: Combating Racisms
- BLKST 201: Taking B(l)ack History
- BLKST 203/ENGL 225: Introduction to Anti-Racist Communication
- HLTH 260/GSJ 260: Social Determinants of Health
- HIST 323: Global History of the Prison
- INDG 318/RS 318: Indigenous Worldviews and Spirituality
- LS 224/SOC 201: Victims and Society
- LS 403/SOC 428: Sentencing as a Social Process
- MUSIC 335/PACS 335: Perspectives in Music and Peace
- PLAN 233: People and Plans
- SMF 307: Conflict in Close Relationships
- SDS 311R/LS 373: Indigenous Peoples and Canadian Public Policy
- SDS 331R: Social Inequality, Social Justice and Social Action
- SDS 411R: Decolonization and Social Action
- SDS 421R: Indigenous-Settler Relations
- SDS 435R: Restorative Approaches to Education
- SDS 449R: Prejudice and Discrimination

Note: When the course content or applied experience in PACS 290, PACS 301, PACS 302, PACS 390, PACS 391, PACS 398, PACS 399, or PACS 490 has an explicit restorative justice theme, these courses may be approved by the PACS Administrative Group for inclusion in the PACS Specialization requirements.

APPENDIX B

Diploma in Restorative Justice

Rationale:
The Diploma in Restorative Justice will educate students to understand an innovative approach to peace and justice that transforms the relationships of those impacted and harmed by conflict, violence or injustice – be it at an individual, familial, workplace, community, or societal level. The Diploma will enable students to analyze the ways systems and institutions cause harm and can be transformed, as well as articulate a vision for justice that can heal individuals and communities. It will also equip students to apply restorative justice philosophies and practices in a variety of contexts. The Diploma in Restorative Justice will be informed by anti-racist and decolonial lenses that foreground the importance of addressing the harms, abuses and violence caused by racism, colonialism and other systems of oppression, making this an integral part of required courses. In addition, students in the Restorative justice Diploma will be required to take at least one Indigenous Studies course that explores Indigenous perspectives on justice, harm and/or healing as part of the program given the importance of these perspectives in shaping the field. The diploma will help advance the goals of the Truth and Reconciliation Commission's (TRC) calls to action and the University of Waterloo's commitments to decolonization. In particular, it responds to the spirit of TRC Call to Action 28, which calls upon law schools to include a course on Aboriginal people and the law, the history and legacy of residential schools, historical harms, treaty relations as well as building skills in intercultural competency, human rights, conflict resolution, and anti-racism. It also responds to the spirit of Call to Action 63.iii to education leaders for building student capacity for intercultural understanding, empathy and mutual respect. Instructors teaching courses included in the Diploma in Restorative Justice will be invited to participate in a pedagogy community of practice hosted by PACS, which will explore ways in which restorative justice philosophy and antiracist and decolonial lenses relate to and inform pedagogical approaches and principles of restorative justice. Students who complete the Diploma will be able to:

- Explain restorative justice philosophy, its historical roots, and aspects of its interdisciplinary scholarship.
- Critically reflect on restorative justice practices and ethics.
- Apply anti-racist and decolonial lenses to understand how power interacts with systems of oppression in relation to harms and violence as well as restorative justice practices and agency.
- Demonstrate skills in applying aspects of restorative justice philosophy and practice in their life, field studies, and/or professional work.

We believe that the Diploma option may attract some persons from the local community who have personal interest in learning more about restorative justice. The Waterloo area is known as one of several regions in Canada that has been profoundly impacted by restorative justice practices applied to criminal justice, social services, and domestic relations. PACS believes that a Diploma may appeal to persons who work in professions who would not otherwise be ready to pursue a full university degree, and enable them to earn a Diploma that demonstrates greater proficiency in restorative justice. Vocational pursuits that may particularly benefit from the Diploma include those related to social work, policing, corrections, law, human resources, social activism, management, leadership, crisis management, planning, education, mediation, arbitration, and family dissolution. It can also provide an opportunity for people to think about connections to work happening locally in relation to anti-racism, decolonization and repairing other historical harms. The Diploma in Restorative Justice cannot be combined with the Restorative Justice Specialization.

Proposed Calendar Text:
Students enrolled in degree programs or any non- or post-degree academic plan may pursue the Diploma in Restorative Justice.

The Diploma in Restorative Justice requires successful completion of a minimum of three academic units (six courses) with a minimum cumulative diploma average of 65%, including:

- PACS 202/LS 271: Conflict Resolution

- PACS 329/LS 344: Restorative Justice
- PACS 331: Trauma, Healing, and Social Transformation
- One of:
    - INDG 201/CDNST 201: The Indigenous Experience in Canada
    - INDG 272/ANTH 272: Issues in Contemporary Indigenous Communities in Canada
    - INDG 228/PSCI 228: Introduction to Indigenous Political Thought
- Two additional courses, one of which must be at the 300-level or above, from:
    - PACS 314: Restorative Justice and Transformative Education
    - PACS 318: Peacebuilding in Divided Societies
    - BLKST 103: Combating Racisms
    - BLKST 201: Taking B(l)ack History
    - BLKST 203/ENGL 225: Introduction to Anti-Racist Communication
    - HLTH 260/GSJ 260: Social Determinants of Health
    - HIST 323: Global History of the Prison
    - INDG 318/RS 318: Indigenous Worldviews and Spirituality
    - LS 224/SOC 201: Victims and Society
    - LS 403/SOC 428: Sentencing as a Social Process
    - MUSIC 335/PACS 335: Perspectives in Music and Peace
    - PLAN 233: People and Plans
    - SMF 307: Conflict in Close Relationships
    - SDS 311R/LS 373: Indigenous Peoples and Canadian Public Policy
    - SDS 331R: Social Inequality, Social Justice and Social Action
    - SDS 411R: Decolonization and Social Action
    - SDS 421R: Indigenous-Settler Relations
    - SDS 435R: Restorative Approaches to Education
    - SDS 449R: Prejudice and Discrimination

Note: When the course content or applied experience in PACS 290, PACS 301, PACS 302, PACS 390, PACS 391, PACS 398, PACS 399, or PACS 490 has an explicit restorative justice theme, these courses may be approved by the PACS Administrative Group for inclusion in the PACS Diploma requirements.

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Senate Undergraduate Council

For Approval **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Presenter: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**10c. Report - Senate Undergraduate Council:** **New Academic Plan – Social Innovation and Impact Minor**

Recommendation/Motion:
To approve the proposed new academic plan, Social Innovation and Impact Minor, for the Faculty of Arts, effective 1 September 2024, as presented.

Summary:
Senate Undergraduate Council met on June 20, 2023 and agreed to forward the following items to Senate for approval as part of the regular agenda.

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:
Academic Council of United College approval date (mm/dd/yy): 09/21/22
Senate Undergraduate Council approval date (mm/dd/yy): 06/20/23

Background and Rationale:
The University of Waterloo currently offers individual courses and co-curricular programming in Social Innovation and Impact and its allied fields of study and practice. However, the University does not currently offer an academic credential in this field which is surprising given that we are one of Canada's premier innovation-based universities. This Minor will enable students across our campus to leverage their education across a range of academic disciplines, through our core experiential learning opportunities, to make meaningful and lasting social impacts. On completing this Minor, students will be able to (1) identify and define opportunities for social innovation (2) apply a range of tools and skills to design and develop responsive initiatives (3) launch and test these initiatives for the intended impact (4) collaborate with stakeholders across the public, private and civil society sectors to enhance the scale and sustainability of their initiatives. This program will not require any new resources from the Faculty of Arts. Our initial target audience will include students in three programs (INDG/INDENT, REC, INDEV) in three Faculties (Arts,

Environment, Health) and students enrolled in GreenHouse programs. We will also coordinate with the BET program in the Conrad School to make our courses available to interested students. We will target enrolment amongst first and second-year students, especially in courses with content closely allied to the Minor such as INDEV 308 (30+ students) and REC 218 (30+ students). The GreenHouse program currently enrolls 40 students per semester. Once the Minor is fully operational, we will aim to graduate at least 10 students per year with a medium-term goal of increasing enrolments to 50 students per semester.

The Minor in Social Innovation and Impact is a unique academic credential offering students across the University of Waterloo the ability to research, define, design, launch and test social innovations through applied and experiential learning opportunities. This program will be administered through United College at the University of Waterloo in collaboration with departments and colleagues across campus. The GreenHouse Social Impact Incubator at United College will be used to provide the core experiential learning basis for this program.

Consultation: While there are individual courses in the allied field of social entrepreneurship offered in at least three Faculties (Environment, Health, Engineering), none provides students with the opportunity to obtain an academic credential in the field. The Faculty of Environment offers individual courses in green (ENBUS 203) and social entrepreneurship (INDEV 308). The Faculty of Health offers an introductory course in Social Entrepreneurship (REC 218) on which they collaborate closely with GreenHouse. The Conrad School of Entrepreneurship continues to build on their offerings in the area of social entrepreneurship (e.g. BET 360, 420). Fruitful and ongoing discussions with these Faculties have yielded strong complementarities between their course offerings and the Minor.

Proposed Calendar text:
Students enrolled in any degree program may pursue a minor designation in Social Innovation and Impact.

The Social Innovation and Impact Minor requires successful completion of a minimum of four academic course units (eight courses) with a minimum cumulative minor average of 65%, including:

- INNOV 200, INNOV 201, INNOV 300, INNOV 302, INNOV 311, INNOV 411
- One of the following sets of two courses:
    - Two of REC 201, 218, 356, 361
    - Two of INDG 201, 272, 305, 318
    - Two of INDEV 200, 212, 308, 387
    - Two of BET 100, 300, 360, 420

Course List
Social Innovation and Impact (core required courses)
INNOV 200 Theory and Practice of Social Innovation
INNOV 201 Social Innovation for Global Impact
INNOV 300 Case Studies for Social Innovation for Impact
INNOV 302 Measuring and Evaluating Social Innovation for Impact
INNOV 311 Research for Social Innovation
INNOV 411 Designing for Social Innovation

Health: Recreation and Leisure Studies
REC 201 Recreation and Social Justice
REC 218 Social Entrepreneurship for Change
REC 356 Leisure and Community
REC 361 Aging and Leisure

Arts: Indigenous Studies and Indigenous Entrepreneurship
INDG 201 The Indigenous Experience in Canada

INDG 272 Issues in Contemporary Indigenous Communities in Canada
INDENT 200 The Past, Present, and Future of Indigenous Entrepreneurship
INDENT 310 Case Studies in Indigenous Venture Creation

Environment: International Development
INDEV 200 Political Economy of Development
INDEV 212 Problem Solving in International Development
INDEV 308 Introduction to Social Entrepreneurship
INDEV 387 Global Cities in Global Development

Engineering: Conrad School of Entrepreneurship and Business
BET 100 Foundations of Entrepreneurial Practice
BET 300 Foundations of Venture Creation
BET 360 Design for Social Ventures
BET 420 Entrepreneurship for Social Impact

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Senate Undergraduate Council

For Approval **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	David DeVidi, Associate Vice-President, Academic
Sponsor: **Contact Information:**	Charmaine Dean Vice-President, Research & International
Sponsor: **Contact Information:**	Jeff Casello Associate Vice-President, Graduate Studies and Postdoctoral Affairs
Presenter: **Contact Information:**	David DeVidi, Associate Vice-President, Academic david.devidi@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**11a. Report - Senate Graduate & Research Council and Senate Undergraduate Council: Course Delivery Modes**

Recommendation/Motion:
To approve the adoption of the new and revised definitions for the undergraduate calendar and the graduate calendar (Glossary of terms), effective 1 September 2023, as presented.

Summary:
Senate Graduate & Research Council met on 12 June 2023 and Senate Undergraduate Council met on June 20, 2023, and agreed to forward the following items to Senate for approval as part of the regular agenda.

Appendix A provides proposed definitions for class delivery modes that were developed by the Registrar's Office through the members of Keep Learning Team and led by the Associate Registrar to improve clarity for instructors and students when scheduling and selecting courses each term. The increased interest in and adoption of blended learning courses has amplified the importance of this project at this time.

Jurisdictional Information:
This item is being submitted to Senate in accordance with Senate Bylaw 2; section 4.03(e): "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." and section 5.03(a): "Make recommendations to Senate with respect to rules and regulations for the governance, direction and management of undergraduate studies in the university."

Governance Path:
Senate Undergraduate Council approval date (mm/dd/yy): 09/20/22
Senate Graduate & Research Council approval date (mm/dd/yy): 06/12/23
Senate Undergraduate Council approval date of revised material (mm/dd/yy): 06/20/23

Documentation Provided:
Appendix A

APPENDIX A

Definitions for Modes
IN-PERSON: a class with scheduled instruction or activity occurring in-person
BLENDED: a class in which instruction or activity is distributed between scheduled in-person and required online activities, resulting in fewer scheduled in-class hours.
ONLINE: a class scheduled to be fully online that requires no in-person instruction or activity (may require in-person exam(s)); may be exclusively asynchronous (no scheduled meets), synchronous (scheduled meets), or a combination of the two.

NOTE (not for inclusion in the calendar): Hyflex classes have recently been delivered in a held-with format, where 2 delivery modes are held simultaneously. Hyflex is an emerging combined mode that will need definition and system development in order to evolve further. Hyflex = a class that is scheduled both in-person and is simultaneously delivered remotely. Students have the choice to attend in-person or remotely on a class-by-class basis. Future considerations of hyflex should also address the possibility of an asynchronous option for those engaging in the course online.

CLASS DELIVERY MODES	DEFINITION	NOTES/EXAMPLES	SCHEDULING TERMS ASSOCIATED WITH EACH DELIVERY MODE		
			THE "CAMPUS" CODES INDICATE WHICH INSTITUTION OFFERS THE COURSE	THE "LOCATION" OF WHERE A COURSE IS TAUGHT IS ALSO IDENTIFIED	EXAMPLES
IN-PERSON	A class with scheduled instruction or activity occurring in-person	Scheduled meet only on campus/in-person	**UW:** University of Waterloo (Main) **CGC:** Conrad Grebel University College **REN:** Renison University College **STJ:** St. Jerome's University **UTD:** United College **WLU:** Wilfrid Laurier University	**U:** Main campus **G:** Conrad Grebel University College **J:** St. Jerome's University **UTD:** United College **R:** Renison University College **L:** Wilfrid Laurier University **STRATFORD:** Stratford campus **KITCHENER:** Kitchener campus **CAMBRIDGE:** Cambridge campus	**UW U** = Taught by the University of Waterloo at the University of Waterloo's Main Campus **UW STRATFORD** = Taught by the University of Waterloo at the University of Waterloo's Stratford Campus
BLENDED	A class in which instruction or activity is distributed between scheduled in-	Scheduled on-campus meet + asynchronous online meet/activity (e.g., flipped classroom)	**BLND:** Blended course (Main) **BLNDG:** Blended course (Conrad Grebel	**U:** Main campus **G:** Conrad Grebel University College **J:** St. Jerome's University	**BLND U** = Taught by the University of Waterloo; on-campus meet is at the University

	person and required online activities, resulting in fewer scheduled in-class hours	Scheduled on-campus meet + synchronous online meet/activity Both types of meets must appear in the schedule of classes, including the online piece whether asynchronous or synchronous To reduce class time, seek approval from department chair	University College) **BLNDJ:** Blended course (St. Jerome's University) **BLNDT:** Blended course (United College) **BLNDR:** Blended course (Renison University College)	**UTD:** United College **R:** Renison University College **L:** Wilfrid Laurier University **STRATFORD:** Stratford campus + **ONLINE:** Online course	of Waterloo's Main Campus and includes online element **BLND UTD =** Taught by the University of Waterloo; the on-campus meet is at United College and includes online element
ONLINE	A class scheduled to be fully online that requires no in-person instruction or activity (may require in-person exam(s)); may be exclusively asynchronous, synchronous, or a combination of the two.	Fully online CEL course Instructor-developed online course Fully synchronous course with regularly scheduled meets via web conferencing Asynchronous course with some scheduled meets (seminars, tutorials, office hours) Synchronous course with online asynchronous discussion or other activities	**ONLN:** Online course (Main) **ONLNG:** Online course (Conrad Grebel University College) **ONLNJ:** Online course (St. Jerome's University) **ONLNT:** Online course (United College) **ONLNR:** Online course (Renison University College)	**ONLINE:** Online course	**ONLN ONLINE =** Taught by the University of Waterloo and occurs online **ONLNR ONLINE =** Taught by Renison University College and occurs online

For Information **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	Mary Wells, Dean of Engineering engdean@uwaterloo.ca
Presenter: **Contact Info:**	Mary Wells, Dean of Engineering engdean@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**12. Proposed amendments to the Constitution and By Laws for the Assembly and Faculty Council of the Faculty of Engineering**

Summary:

This report provides the proposed constitutional amendments, including background, consultation activity, and the supportive result from the vote held following a special Engineering Faculty Assembly meeting (June 21, 2023). The Assembly approved the Proposed amendments to the Constitution and By Laws for the Assembly and Faculty Council of the Faculty of Engineering (hereinafter "Constitution and By Laws").

Recommendation/Motion:

To approve the amendments to the *Constitution and By Laws for the Assembly and Faculty Council of the Faculty of Engineering* as recommended by the Engineering Faculty Assembly.

Governance Path:

Discussion at the Faculty of Engineering Academic Policy Committee meeting (May 9, 2023) Discussion at the Engineering Faculty Council (May 16, 2023)
Motion at a special Engineering Faculty Assembly held on June 21, 2023

Previous Action Taken:

In early 2023, the Faculty of Engineering initiated a review of its Constitution and By Laws. While there have been occasional updates to this foundational document in recent years, there had not been any comprehensive review undertaken in some time. The Faculty determined that the Constitution and By Laws were outdated, as they did not reflect new academic programs, the revised organizational structure as well as evolving position titles.

As the Constitution and By Laws is a comprehensive document with different parts requiring different governance paths approvals, a decision was made to take a two-step approach: the first step would be to review the Constitution (as documented in this memo); and the second step review the By Laws after the proposed constitutional amendments are accepted.

In conducting this review, the Faculty of Engineering followed the following principles:

1. There should not be any change to the mandate of the Engineering Faculty Assembly and Council.
2. While the intention is to align with the current organizational structure and position titles in and outside Engineering, efforts should be made to be "future-proof" where possible.
3. Application of equity, diversity and inclusion as a lens in reviewing the document

The proposed constitutional amendments were first presented at the Academic Policy Committee (under Engineering Faculty Council) on May 9, 2023. Subsequently, discussion took place at the 16 May 2023 Engineering Faculty Council meeting to go over the changes and answer questions that Council members had. In accordance with the Constitution, a special Engineering Faculty Assembly was called to discuss and consider the constitutional amendments (the Motion) on June 21,2023. To help reach quorum, an electronic ballot was held immediately after the special Assembly to vote on the proposed constitutional amendments.

53.8% of Assembly members participated in voting, satisfying the 40% quorum required by the Constitution. Of those voted, 94.9% voted in favor of the proposed amendments. As such, the motion was carried.

Pursuant to the Constitution, the Faculty of Engineering is kindly seeking the acceptance of these proposed constitutional amendments by the Senate.

Documentation Provided:

- Summary of constitutional amendments
- Revised Constitution with track changes

EFA EFC Constitutional Amendments
Summary of Changes

Section	Existing	Proposed
Assembly Membership	iii) All Professors, Professors Emeriti, Associate Professors and Assistant Professors holding full time appointments in the Faculty of Engineering for terms longer than one year.	iii)All regular faculty members as defined by Policy 76 (Faculty Appointments), holding full time appointments in the Faculty of Engineering for terms longer than one year.
	iv) Four staff representatives from full-time staff, to be elected by staff.	iv)Four staff representatives who are elected members of the Council.
	v) The Program Administrator, Engineering or such other delegate that the Director of Co-operative Education and Career Services may name.	v)One representative from Co-operative and Experiential Education that the Executive Director may name.
	vi) The Assistant Registrar, Engineering, or such other delegate that the Registrar may name.	vi)One representative from the Registrar's Office that the University Registrar may name.
	ix) The Director of Software Engineering, or such other delegate that the Director of Software Engineering may name.	ix)Directors of collaborative programs, or such other delegate that each Director may name, if the Directors or named delegates are not already members of the Assembly.
Council Membership	v) The Academic Department Heads of each academic department in the Faculty of Engineering and the Chairs of the Geological Engineering Board and the Environmental Engineering Board.	v)Academic Unit Heads (Department Chairs and School Directors) in the Faculty of Engineering.
	vi) The Director of Software Engineering, or such other delegate that the Director of Software Engineering may name. vii) The Director of the Mechatronics Program, or such other delegate that the Director of the Mechatronics Program may name. ix) The Director of the Nanotechnology Program, or such other delegate that the Director of the Nanotechnology Program may name. x) The Director of the Biomedical Engineering Program, or such other delegate that the Director of the Biomedical Engineering Program may name.	vi)Directors of collaborative programs, or such other delegate that each Director may name.
	xi) The Program Administrator, Engineering, or such other delegate that the Director of Co-operative Education and Career Services may name.	viii)One representative from Co-Operative and Experiential Education that the Executive Director may name.
	xiv) Assistant Registrar, Engineering, or such other delegate that the Registrar may name.	xi)One representative from the Registrar's Office that the University Registrar may name.
	xv) Four undergraduate engineering students, each elected for a two year term.	xii)Four undergraduate students enrolled in the Faculty of Engineering, each elected for a two year term.
	xvi)Two graduate engineering students, each elected for a two year term.	xiii)Two graduate students enrolled in the Faculty of Engineering, each elected for a two year term.

CONSTITUTION AND BY LAWS FOR THE ASSEMBLY
AND FACULTY COUNCIL OF THE FACULTY OF ENGINEERING
(updated June 2023)

(Hereafter called the Assembly and the Council respectively)

PREAMBLE:

When the business of a meeting is carried out by an Assembly of members, the privileges of each individual to speak and vote as an independent reflects the principle of democratic government. When, however, the business is conducted by a representative Council it is imperative that if this principle is to be maintained then each elected member to the council must act by his or her own conscience for the good of the whole and not as a delegate for any particular sub grouping of the Assembly.

It is this principle that is embodied in the setting out and interpretation of this Constitution and By Laws.

CONSTITUTION

I ASSEMBLY:

A. Membership

i) The President of the University.

ii) The Vice President (Academic).

iii) All regular faculty members as defined by Policy 76, holding full time appointments in the Faculty of Engineering for terms longer than one year.

iv) Four staff representatives who are elected members of the Council.

v) One representative from Co-perative and Experiential Education that the Executive Director of may name.

vi) One representative from the Registrar's Office that the University Registrar may name.

vii) One representative from each of the Councils of other Faculties.

viii) Those Engineering students, both undergraduate and graduate, who are elected members of the Council and/or its standing committees.

ix) Directors of collaborative programs, or such other delegate that each Director may name, if the Directors or named delegates are not already members of the Assembly.

x) The University Librarian or such other delegate that the University Librarian may name.

The Assembly will have the power to add to its membership.

B. Powers and Duties

i) The Assembly has the right to dismiss the Council by a vote of non confidence and call for new elections except that for such a motion to be acted on a quorum of forty per cent of all members of the Assembly will be required.

ii) The Assembly shall meet at least once each year to receive reports from the Council.

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iii) The Assembly may make rules and regulations for the governance of its proceedings.

iv) The Assembly has the power to require Council to consider any matter.

II COUNCIL:

A. Membership

Only members of the Assembly are eligible to serve as members of the Council.

i) The President of the University.

ii) The Vice President (Academic).

iii) The Dean of Engineering.

iv) The Associate Deans of Engineering.

v) The Academic Unit Heads (Departments and Schools) in the Faculty of Engineering.

vi) Directors of collaborative programs, or such other delegate that each Director may name.

vii) The Academic Director of WATPD-Engineering, or such other delegate that the Academic Director of WATPD-Engineering may name.

viii) One representative from Co-Operative and Experiential Education that the Executive Director may name.

ix) Engineering Members of faculty elected from each teaching department, in number equal to the largest integer smaller than one-fifth of the faculty members of Assembly in that department, elected by the faculty members of the department each for a two year term.

x) Four staff members to include the Chair and Vice-Chair of the Dean's Staff Advisory committee plus two other members of the committee elected by the staff members of the Faculty.

xi) One representative from the Registrar's Office that the University Registrar may name.

xii) Four undergraduate students enrolled in the Faculty of Engineering, each elected for a two year term.

xiii) Two graduate students enrolled in the Faculty of Engineering, each elected for a two year term.

xiv) One representative from each of the Councils of other Faculties.

xv) The University Librarian or such other delegate that the University Librarian may name.

B. Powers and Duties

i) To make rules, regulations and by laws for governing its proceedings, including the determination of the quorum necessary for the transaction of business.

ii) Subject to the approval of the Senate, to determine the courses of study in the Faculty and conditions of admission into various courses.

iii) Subject to approval and confirmation by Senate, to conduct the examination of the academic courses in the Faculty and determine the results of such examinations.

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iv) To recommend to Senate candidates for the conferring of degrees, diplomas, awards and other honours.

v) To appoint standing committees and delegate powers to them as may be necessary.

vi) To consider and report to the Senate upon such matters affecting the Faculty as may seem appropriate to the Council.

vii) To recommend to the Senate policies governing the operation of the Faculty of Engineering.

viii) To call meetings of the Assembly.

ix) To act on behalf of the Assembly in any matter of interest to the Faculty.

III AMENDMENT:

A. The Assembly may recommend to Senate amendments to any part of this constitution provided that such recommendations for amendment are approved by at least two thirds of those members present at an Assembly meeting called specially for the purpose of constitutional amendment. The quorum for such a meeting shall be 40% of the membership of the Assembly.

B. The Council may recommend to Senate amendments to Part II of this Constitution provided that:

i) Such recommendations are approved by at least two thirds of those members present at a Council meeting called specially for the purpose of constitutional amendment, with a quorum present of fifty per cent of the membership of Council, and, a period of at least thirty days must elapse between the acceptance by Council of such amendments and their consideration by Senate.

ii) During this time the Assembly may reject any such amendments provided that such a rejection is approved by at least two thirds of the members present. The quorum for such a resolution shall be forty per cent of the membership of the Assembly. Absence of rejection shall be deemed to constitute acceptance by the Assembly.

IV ADOPTION:

This constitution shall come into effect upon its acceptance by the Senate.

Senate Undergraduate Council

For Information **Open Session**

To:	**Senate**
Sponsor:	David DeVidi, Associate Vice-President, Academic
Contact Information:	david.devidi@uwaterloo.ca
Presenter:	David DeVidi, Associate Vice-President, Academic
Contact Information:	david.devidi@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**13. Report - Senate Undergraduate Council**

Summary:
Senate Undergraduate Council met on June 20, 2023 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:

Minor Plan & Curricular Modifications
Council approved minor plan changes, new courses, course changes, and course inactivations for:

a. Faculty of Arts (classical studies; communication arts; communication arts; Conrad Grebel university college; dean of arts; English language and literature; English language and literature; fine arts; French studies; Germanic & Slavic studies; history; philosophy; philosophy; political science; psychology; religious studies; Renison university college; school of accounting and finance; sociology and legal studies; Spanish & Latin American studies; St Jerome's university; and United college)

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:

(c) 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.

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Office of the Vice President, Research and International

For Discussion **Open Session**

To:	**Senate**
Sponsor:	Charmaine Dean, Vice President Research and International
Contact Information:	vpri@uwaterloo.ca
Presenter:	Charmaine Dean, Vice President Research and International
Contact Information:	vpri@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**14a. Awards, Distinctions, Grants, Waterloo International Engagements**

Summary:

Presenting the Vice-President, Research and International Report to Senate for September 2023. This report to Senate highlights successful research, international and entrepreneurial outputs and outcomes for the period June-July 2023 by the thematic areas as outlined in Waterloo's Strategic Plan 2020-25.

Documentation Provided:

- Vice-President, Research and International Report to Senate for September 2023

Vice-President, Research & International
Report to Senate
September 2023

Introduction

This report to Senate highlights successful research and international outputs and outcomes for the period June-July 2023 by the thematic areas as outlined in Waterloo's Strategic Plan 2020-25.

ADVANCING RESEARCH FOR GLOBAL IMPACT

R1 - Research strengths to solve real-world problems.

Waterloo Ventures

The following are Velocity successes by Waterloo alumni and students:

- Velocity incubator company **Cobionix** has raised **$2.8 million** in seed funding to deploy the first ever tele-robotic medical imaging tool called Codi.
- Velocity incubator company **Ribbit** partner **Transport Canada** is contributing **$1.3 million** to support testing of commercial cargo aircraft to deliver goods to remote northern communities in Canada.
- Velocity start-up **Mycro Harvest** has joined the Velocity Incubator to develop an artificial intelligence-driven mushroom smart farm.
- The Velocity $5K Finals were hosted on July 19, 2023, at the Theatre for the Arts on Waterloo's main campus. The four winning pitches came from:
    - **EyesoBio** – a biotechnology company which uses innovative devices for eye product testing. Pitch by post-doctoral researchers **Dr. Brandon Ho**, **Dr. Kaya Wong**, and **Dr. David Wulff**, Centre for Ocular Research and Education, Faculty of Science.
    - **Entangled Vision** - a screening technology using quantum information tools to detect macular degeneration before vision loss occurs. Pitch by PhD candidate **Connor Kapahi**, Physics – Quantum Information, Faculty of Science.
    - **Pragmatica** - a VR speech therapy solution for people with communicative disorders. Pitch by PhD candidate **Emily Shiu**, Psychology, Faculty of Science; graduate student **Karthik Prasad**, Computer Science, Faculty of Engineering, and Thomas Mastantuono.
    - **Swish** - a cost-effective product to clean solar panels in a sustainable and economical way. Pitch by graduate student **Miswar Syed**, Management Sciences, Faculty of Engineering, and Asaad Alduais, Abdulrahaman Javaid, and Jhonathan Rojas.

Awards and Distinctions

Royal Society of Canada

Fellows of the Royal Society of Canada

Fellows of the Royal Society of Canada are distinguished Canadians from all branches of learning who have made remarkable contributions in the arts, humanities and sciences, as well as in Canadian public life.

- **Dan Scott** (Geography and Environmental Management)
- **Jonathan Li** (Geography and Environmental Management
- **John Hirdes** (Public Health Science)
- **Kerstin Dautenhahn** (Electrical and Computer Engineering)
- **N. Asokan** (Computer Science)

Member of the Royal Society of Canada College of New Scholars, Artists, and Scientists

The Members of the College are Canadians and Permanent Residents who, are less than fifteen years from the date of PhD or disciplinary equivalent and who have demonstrated exceptional accomplishment.

- **Igor Grossmann** (Psychology)
- **Naila Keleta-Mae** (Communication Arts)
- **Nicole Nolette** (French)
- **Aiping Yu** (Chemical Engineering)

University of Waterloo

University Professors of the University of Waterloo, 2023

University of Waterloo recognizes exceptional scholarly achievement and international pre-eminence through the designation 'University Professor'. Once appointed, a faculty member retains the designation until retirement.

- **Philip Beesley** (Architecture)
  Dr. Beesley's research "focuses on the rapidly expanding field of 'smart' buildings interwoven with responsive qualities and computational controls."
- **Geoffrey Fong** (Psychology and Public Health Sciences)
  Dr. Fong's research "focuses on combining psychological theories and research methods with traditional epidemiological survey methods to evaluate the impact of tobacco control policies on entire populations in countries."

University Research Chairs

Waterloo recognizes exceptional achievement and pre-eminence in a particular field of knowledge through the designation 'University Research Chair'.

- **Krzysztof Czarnecki** (Electrical and Computer Engineering)
- **Sharon Kirkpatrick** (Public Health Sciences)
- **Lap Chi Lau** (Computer Science)

- **Simron Singh** (Environment, Enterprise, and Development)
- **Solomon Tesfamariam** (Civil and Environmental Engineering)
- **Chris Yakymchuk** (Earth and Environmental Sciences)
- **David Blowes** (Earth and Environmental Sciences)

2023 Faculty of Arts Awards for Excellence in Research
In recognition of exceptional research achievement, the Faculty of Arts presents up to four Arts Research Awards each year.

- **Lai-Tze Fan** (Sociology & Legal Studies)
- **Ori Friedman** (Psychology)
- **Randy Harris** (English Language and Literature)

2023 Faculty of Mathematics Golden Jubilee Research Excellence Award
In recognition of the outstanding research contributions up to two awards are presented to faculty members in the Faculty of Mathematics each year.

- **Mario Ghossoub** (Statistics and Actuarial Science)
- **Gautam Kamath** (Computer Science)

Individual Awards and Distinctions

Charmaine Dean (Statistics and Actuarial Sciences) - 2023 Statistics Society of Canada (SSC) Gold Medal.

- "This prestigious award recognizes her outstanding contributions to statistical methodology and applications including survival and longitudinal analyses, disease mapping and spatio-temporal modelling, her important novel contributions to fostering truly collaborative interdisciplinary statistical and wildfire research, and her research leadership in Canada."

Monica Emelko, (Civil and Environmental Engineering) – Fellow of the Canadian Academy of Engineering.

- Fellows are selected for their "outstanding contributions to engineering and for serving as role models in their fields and communities." Dr. Emelko has made significant contributions to water science, technology and policy and is a pioneer in climate change research related to water security.

Gautam Kamath (Computer Science) – Canadian Institute for Advanced Research (CIFAR) AI Chair.

- CIFAR AI Chairs provide leadership to the Pan-Canadian AI Strategy aimed at growing "Canada's robust AI research ecosystem and advancing Canada's global leadership in AI." Dr. Kamath is being recognized for "his contributions to differential privacy, machine learning and statistics."

Jimmy Lin (Computer Science) – Fellow of the Association of Computing Machinery.

- This award recognizes ACM members as leaders for their outstanding technical, professional, and service contributions. Dr. Lin is being recognized for his "contributions to question answering, information retrieval, and natural language processing."

Colin MacLeod (Psychology) – 2023 Clifford T. Morgan Distinguished Leadership Award, Psychonomic Society.

- This award honors individuals who have made significant contributions to the field of cognitive psychology and who have demonstrated sustained leadership and service to the discipline. As a Distinguished Professor Emeritus, Dr. Macleod has had a prestigious career researching the broad domain of human cognition, with particular focus on attention, learning, and memory.

Guy Poirier (French) – Canadian Society for Renaissance Studies Lifetime Achievement Award, Congress of the Humanities and Social Sciences.

- "This prestigious award recognizes researchers who have made a major contribution to Renaissance studies in Canada or abroad." Dr. Poirier exemplifies this award through his vast scholarship in French Renaissance literature while at Waterloo.

Carolyn Ren (Mechanical and Mechatronics Engineering) – Fellow of the Canadian Academy of Engineering.

- Fellows are selected for their "outstanding contributions to engineering and for serving as role models in their fields and communities." Dr. Ren is considered one of Canada's top microfluidic technology researchers. Her work has had "broad and profound impact on the global biomedical, pharmaceutical and environmental sectors."

Alexander Wong (Systems Design Engineering) – Fellow of the Royal Society of Medicine.

- Established in 1805, the Royal Society of Medicine is the world's largest medical society dedicated to providing high-quality continuing post-graduate education and learning to the medical profession. Dr. Wong has made significant contributions "to artificial intelligence and medical imaging, efficient deep learning on the edge, automatic machine learning (AutoML), and computational imaging systems."

Alexander Wong (Systems Design Engineering) – Fellow of the Royal Society of Public Health.

- Established in 1856, the Royal Society of Public Health is one of the oldest public health organizations in the world dedicated to improving and protecting the public's health. Dr. Wong has made significant contributions "to artificial intelligence and medical imaging, efficient deep learning on the edge, automatic machine learning (AutoML), and computational imaging systems."

En-Hui Yang (Electrical and Computer Engineering) – 2023 Canadian Award for Telecommunications Research (CATR).

- The Canadian Award for Telecommunications Research is an elite biennial award presented by the Canadian Society of Information Technology. Dr Yang is the third University of Waterloo recipient since the award was established three decades ago. Dr. Yang "is a globally recognized researcher in information theory, data compression and information security with over 200 patents."

Mohammad A. Salahuddin, Aladdin Saleh, and Raouf Boutaba (Computer Science) (with students Muhammad Sluaiman and Mahdieh Ahmadi) – Best Paper at the IFIP/IEEE Network Operations and Management Symposium (NOMS 2023).

- This NOMS 2023 Best Paper Award was received for their paper "Generalizable Resource Scaling of 5G Slices using Constrained Reinforcement Learning."

Sarah Wilkins-Laflamme (Sociology and Legal Studies) – 2022 Best Article, International Society for the Sociology of Religion.

- Awarded for the paper "A Tale of Decline or Change? Working Toward a Complementary Understanding of Secular Transition and Individual Spiritualization Theories."

Tri-Agency Funding and Sponsorship

NSERC/SSHRC Sustainable Agriculture Research Initiative

- **Goretty Dias** (Environment, Enterprise & Development), "Decision support tool to characterize the energy use, impacts and profitability of biofertilizers and alternative technologies in controlled environment agriculture," **$35,000**.

NSERC-CNSC Small Modular Reactors Research Grant

- **Hyock Ju Kwon** (Mechanical and Mechatronics Engineering), "Development of Materials Surveillance Technology for Small Modular Reactors," **$360,000** over **3 years.**
- **Fue-Sang Lien** (Mechanical and Mechatronics Engineering), "Development of a multiscale multiphysics simulation toolset with uncertainty for nuclear safety assessment, design, and licensing of SMRs," **$250,000** over **3 years**.
- **Siby Samuel** (Systems Design Engineering), "Addressing Human Factors Challenges for Control Room Operators in Small Modular Reactors," **$360,000** over **3 years**.

Spring 2023 CIHR Project Grant

Waterloo secured **$1,186,300** in funding with one Project Grant and one Priority Announcement, out of 20 applications submitted. This represents a 10% success rate versus the national success rate of 22%.

CIHR Project Grant

- **Evelyn Yim** (Chemical Engineering), “Bioengineered self-sealing synthetic arteriovenous graft for hemodialysis access,” **$1,086,300**.

CIHR Priority Announcement

- **Mark Ferro** (Public Health Sciences), “Multimorbidity in Children and Youth Across the Life-course (MY LIFE): A Long-term Follow-up,” **$100,000**.

R3 - Leveraging partnerships for research impact

Research Partnerships

NSERC Alliance

- **John Montesano** (Mechanical and Mechatronics Engineering), "Development of safe ultra-lightweight liquid molded composite structures for next generation electric vehicles,” total funding **$949,045**, over **2 years.**
- **James Tung** (Mechanical and Mechatronics Engineering), "Foot-based sensor fusion for ambulatory gait analysis for occupational health & safety,” total funding **$80,000 ,** over **1 year.**
- **Maria Anna Polak** (Civil & Environmental Engineering), "Concrete frame joints reinforced with GFRP bars,” total funding **$323,400,** over **2 years**.

NSERC Quantum Alliance:

- **Jonathan Baugh** (Chemistry), "Next-generation photonic source to enable quantum remote sensing and communications,” total funding **$2,687,110**, over **5 years**.
- **Jan Kycia** (Physics & Astronomy), "Low temperature material characterization of superconducting devices for Quantum computing,” total funding **$1,601,491,** over **5 years**.
- **Adrian Lupascu** (Physics & Astronomy), "Development of a scalable superconducting quantum computing platform based on fluxonium qubits,” total funding **$1,597,724,** over **4 years.**
- **Michael Reimer** (Electrical and Computer Engineering), "Portable semiconductor nanowire quantum sensors with enhanced efficiency and timing resolution,” total funding **$2,518,000** over **5 years**.

Waterloo International Agreements

Between **June 1 and July 25, 2023** Waterloo International facilitated the signing of two agreements as follows:

- **Friedrich-Schiller-Universität Jena** (FSU Jena), Germany, Erasmus+ Inter-Institutional Agreement. This is a 5-year renewal of an agreement signed in 2022 that allows access to Erasmus+ KA171 funding to enable graduate students to go to FSU Jena for a four-month period.
- **University of Graz**, Austria, Erasmus+ This is a 3-year renewal of an agreement that allows access to Erasmus+ KA171 funding to enable two Waterloo students to go on exchange to University of Graz for a four-month period and 1 University of Graz student to come on exchange to Waterloo for a four-month period. It applies to both undergraduate and graduate students.

Waterloo International Delegation

Waterloo International was pleased to host, in support and collaboration with numerous campus partners, the Stellenbosch University senior-level delegation on July 10th with Vice-Chancellor Prof. Wim de Villiers and his colleagues. This delegation involved meetings with President Goel, Vice-President Dean and members of Waterloo from Faculties, Institutes and Academic Supports Units across campus. Together common themes in research, teaching and community across data science, health tech, SDGs, and entrepreneurship were identified.

Office of the Vice-President, Academic and Provost

For Information **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	James W.E. Rush, Vice-President, Academic and Provost provost@uwaterloo.ca
Presenter: **Contact Information:**	James W.E. Rush, Vice-President, Academic and Provost provost@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**15. 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 page[1].

[1] https://uwaterloo.ca/secretariat/sites/default/files/uploads/documents/all-reports-sept-.pdf

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Office of the President and Vice-Chancellor

For Information		**Open Session**
To:	**Senate**	
Sponsor: **Contact Information:**	Vivek Goel, President and Vice-Chancellor president@uwaterloo.ca	
Presenter: **Contact Information:**	Vivek Goel, President and Vice-Chancellor president@uwaterloo.ca	
Date of Meeting:	**September 18, 2023**	
Agenda Item Identification:	**16. Report of the President – Tenure and Promotion of Faculty Members**	

Summary:

The attached report provides a summary of the 2022/23 tenure and promotion cycle carried out under Policy 77 – Tenure and Promotion.

TENURE AND PROMOTION OF FACULTY MEMBERS

This report provides a summary of the 2022/23 tenure and promotion cycle carried out under Policy 77 – Tenure and Promotion. The following individuals were awarded tenure and/or promoted, effective 1 July 2023 and are reported to Senate for information in accordance with Section 6 of the policy.

The expectations for the granting of tenure are: a record as a good teacher committed to academic and pedagogical excellence; a record of high-quality and peer-assessed scholarly or creative work (normally demonstrated by publication or presentation in suitable academic or artistic forums); and a record of professional, university or community service. The granting of tenure normally will require a record of strong performance in both scholarship and teaching, with satisfactory performance in service. However, a candidate may also qualify for appointment as a tenured Associate Professor by virtue of very strong performance in scholarship or teaching with at least satisfactory performance in the other two areas. [*ref*: Policy 77 – Tenure and Promotion].

FOR INFORMATION

Awarded Tenure and Promoted to Associate Professor:
Wasem Alsabbagh, School of Pharmacy
Shalev Ben-David, Computer Science
Elliot Biro, Mechanical and Mechatronics Engineering
Janet Boekhorst, Conrad School of Entrepreneurship and Business
Cliff Butcher, Mechanical and Mechatronics Engineering
Dillon Browne, Psychology
Warren Dodd, School of Public Health Sciences
Alexis Dolphin, Anthropology
Anna Drake, Political Science
Sean Geobey, School of Environment, Enterprise and Development
Komal Habib, School of Environment, Enterprise and Development
Jean-Pierre Hickey, Mechanical and Mechatronics Engineering
Laura Hug, Biology
Rajibul Islam, Physics and Astronomy
Anna Klinkova, Chemistry
Alexander Lanoszka, Political Science
Houra Mahmoudzadeh, Management Sciences
Andrea Quinlan, Sociology and Legal Studies
Parsin Haji Reza, Systems Design Engineering
Rebecca Saari, Civil and Environmental Engineering
Oliver Schneider, Management Sciences
Crystal Senko, Physics and Astronomy
Rodney Smith, Chemistry
Adam Wei Tsen, Chemistry
Kejia Zhu, Management Sciences

Awarded Tenure:
Na Young Kim, Electrical and Computer Engineering
Shane McIntosh, Computer Science
Liam McGuire, Biology
Andre Stanberry, School of Optometry and Vision Science

Promoted to Professor:
Hossein Abouee Mehrizi, Management Sciences
Sarah Burch, Geography and Environmental Management
Jennifer Clary-Lemon, English Language and Literature
James Craig, Civil and Environmental Engineering
Igor Grossmann, Psychology
Maud Gorbet, Systems Design Engineering
Jeffrey Gostick, Chemical Engineering
Jasmin Habib, Political Science
Emmett Macfarlane, Political Science
Mark Oremus, School of Public Health Sciences
Rodolfo Pellizzoni, Electrical and Computer Engineering
Michael Waite, Applied Mathematics
Katherine White, Psychology
Evelyn Yim, Chemical Engineering

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Office of the Vice-President, Academic and Provost

For Information	**Open Session**
To:	**Senate**
Sponsor: **Contact Information:**	James W.E. Rush, Vice-President, Academic and Provost provost@uwaterloo.ca
Presenter: **Contact Information:**	James W.E. Rush, Vice-President, Academic and Provost provost@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**17. Call for Nominations for University Professor**

Summary:

The attached memorandum details the process and timelines for which members of the University of Waterloo community may submit nominations for University Professor.

MEMORANDUM September 18, 2023

To: Members of Senate
Chairs of Departments and Directors of Schools

Copy: Daily Bulletin

From: James W.E. Rush, Vice-President Academic and Provost

Re: **Call for University Professor nominations**

To date, Waterloo has awarded this distinction to thirty five individuals: Garry Rempel (chemical engineering), Mary Thompson (statistics and actuarial science) and Mark Zanna (psychology) in 2004; Terry McMahon (chemistry), Cam Stewart (pure mathematics) and Robert Jan van Pelt (architecture) in 2005; Phelim Boyle (accountancy) and Ian Munro (computer science) in 2006; Ken Davidson (pure mathematics), Keith Hipel (systems design engineering) and Jake Sivak (optometry) in 2007; Roy Cameron (health studies and gerontology) and Flora Ng (chemical engineering) in 2008; Ellsworth LeDrew (geography and environmental management) and Ming Li (computer science) in 2009; Stuart McGill (kinesiology) and Janusz Pawliszyn (chemistry) in 2010; Robert Le Roy (chemistry) in 2011; François Paré (french studies) in 2012; Doug Stinson (computer science) in 2013; William Coleman (political science), and William Cook (combinatorics and optimization) in 2015; Linda Nazar (chemistry) in 2016; Xuemin (Sherman) Shen (electrical and computer engineering), Joanne Wood (psychology) in 2017; Tamer Ozsu (school of computer science) in 2018; Claudio Canizares (electrical and computer engineering), Richard Cook (statistics and actuarial science) and Lyndon Jones (optometry and vision science) in 2020; Jennifer Clapp (environment, resources and sustainability) and Weihua Zhuang (electrical and computer engineering) in 2021; John Hirdes (public health sciences) and Robert Mann (physics and astronomy) in 2022; Philip Beesley (architecture) and Geoffrey Fong (psychology/public health sciences) in 2023.

The nomination and selection process is available at https://uwaterloo.ca/provost/university-professors and is reproduced below for your information.

Please ensure that nomination material is submitted to my office by December 22, 2023 to ProvostOffice-General@uwaterloo.ca

UNIVERSITY PROFESSOR
The University of Waterloo owes much of its international reputation and stature to the quality of its eminent professors. University of Waterloo recognizes exceptional scholarly achievement and international pre-eminence through the designation University Professor. Once appointed, a faculty member retains the designation until retirement.

Not counting retirees, it is anticipated there will be one University Professor for approximately every 60 full-time regular faculty members, with at most two appointments each year. Such appointments are reported to Senate and the Board of Governors in March and April respectively.

Nomination and Selection Process

1. Annually, nominations will be sought from Faculty deans, directors of schools and department chairs, as well as from the university community generally. A nominee shall have demonstrated exceptional scholarly achievement and international pre-eminence in a particular field or fields of knowledge. The individual who nominates a colleague is responsible for gathering the documentation and submitting it to the vice-president academic and provost by December 22, 2023 to ProvostOffice-General@uwaterloo.ca. The University Tenure and Promotion Committee will act as the selection committee; its decisions are final.

2. A nomination must be supported by at least six signatures from at least two UW departments/schools and must be accompanied by a curriculum vitae and a short, non-technical description of the nominee's contributions.

3. A nomination must also be accompanied by letters from the nominee's Dean, and from at least two and no more than five scholars of international standing in the nominee's field from outside the University. The scholars are to be chosen by the nominee's Chair/Director in consultation with the Dean and the nominator. The letter of nomination should explain why these particular scholars were chosen.

4. Letters soliciting comments from scholars shall be sent by the Chair/Director. Scholars shall be asked to comment on the impact and specific nature of the nominee's most influential contributions, addressing their responses directly to the Vice-President, Academic and Provost.

5. The dossiers of unsuccessful nominees remain in the pool for two additional years. The appropriate Dean should provide updated information each year.

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Senate Nominating Committee for Honorary Degrees

For Information **Open Session**

To:	**Senate**
Sponsor: **Contact Information:**	Vivek Goel, President and Vice-chancellor president@uwaterloo.ca
Sponsor: **Contact Information:**	Jim Rush, Vice-President Academic & Provost provost@uwaterloo.ca
Presenter: **Contact Info:**	Vivek Goel, President and Vice-chancellor president@uwaterloo.ca
Date of Meeting:	**September 18, 2023**
Agenda Item Identification:	**Report – Honorary Degree Committee**

Summary:

The Senate Honorary Degree Committee announces the 2023 Fall Convocation List of Honorands.

Faculty of Mathematics: Friday, October 20, 2023, 10:00am

- David Hand – Honorary Doctor of Mathematics (S)
- Scott Davis - Honorary Member of the University

Faculty of Health & Faculty of Science: Friday, October 20, 2023, 2:30pm

- TBD – Honorary Degree Recipient/invited guest speaker (S)
- Karen Trevors – Honorary Member of the University

Faculty of Arts: Saturday, October 21, 2023, 10:00am

- Alison Phipps – Honorary Doctor of Letters (S)
- William Chesney – Honorary Member of the University

Faculty of Engineering and Faculty of Environment: Saturday, October 21, 2023, 2:30pm

- TBD – Honorary Degree Recipient/invited guest speaker (S)
- Dennis Huber – Honorary Member of the University

S = speaker

Biographies:

David Hand (DMath, Mathematics)
Professor David Hand is Senior Research Investigator and Emeritus Professor of Mathematics at Imperial College, London. He is also Chief Scientific Advisor to Winton Capital Management, a non-executive director of the UK Statistics Authority, and the Chair of the Board of the UK Administrative Data Research Network. Professor Hand is a Fellow of the British Academy, an Honorary Fellow of the Institute of Actuaries, and in 2013 was made an Officer of the Most Excellent Order of the British Empire

(OBE) for his services to research and innovation. He has authored/co-authored more than 300 scientific papers and 31 books. He has served (twice) as President of the Royal Statistical Society whose Guy Silver Medal for research merit he had previously won. His research has garnered him numerous other awards including a Research Merit Award from the British Royal Society, the George Box Medal from the European Network for Business and Industrial Statistics, and the Research Medal of the International Federation of Classification Societies.

Scott Davis (HM, Mathematics)
Scott Davis has had an outstanding career, spanning over 35 years within Co-operative Education. His work as a program coordinator supported thousands of students in their learning, and as faculty relations manager he collaborated with Associate Deans on program reviews, new program development, and problem-solving student cases. Outside of the University, he served on the board of Experiential & Work Learning Ontario (EWO) as Chair, was active with Co-operative Education and Work Integrated Learning Canada (CEWIL CANADA), was chair of the Accreditation Council, and participated in a quality improvement think tank for the Co-operative Education and Internship Association (CEIA). His unfailing commitment to the core elements of co-operative education contributed significantly to the high-quality co-op program Waterloo is known for today.

Karen Trevors (HM, Health & Science)
Karen Trevors is a UW alumna, having received her MSc degree in Biology in 1981. She was hired as an Instructor in the department of Biology in 1985 and became Executive Officer in the Faculty of Science in 2000, a role she remained in until her retirement in 2023. As Executive Officer she supported four different Deans and helped guide administrative activities for the Faculty of Science and its four departments and two professional schools in the faculty. A strong administrator, strategic thinker and a phenomenal collaborator, Karen served on numerous Faculty and University-wide committees over her career. Her 37 years of dedication and service has been both distinctive and distinguished, leaving many lasting impacts on the Faculty of Science and the broader University Community.

Alison Phipps (DLitt, Arts)
Dr. Alison Phipps is Professor of Languages and Intercultural Studies in the School of Education at the University of Glasgow. Dr. Phipps holds the UNESCO Chair in Refugee Integration through Languages and the Arts, and is co-convenor of the Glasgow Refugee, Asylum and Migration Network. Dr. Phipps has published widely in the fields of modern languages, tourism and intercultural studies, European anthropology, and higher education studies. Dr. Phipps' contributions to academia and society have been recognized with several awards and honours including the Order of the British Empire for services to Education and Intercultural and Interreligious Relations. She is also an elected Fellow of the Royal Society of Edinburgh, Fellow of the Royal Society of Arts, and Fellow of the Academy of Social Sciences.

William Chesney (HM, Arts)
William "Bill" Chesney retired as an Associate Professor in the Department of Communication Arts after 27 years at the University of Waterloo. Professor Chesney is a well-accomplished researcher who made immense contributions through his teaching. He also made important service contributions as Department Chair and Associate Dean, Undergraduate Students in the Faculty of Arts. As a set and costume designer

and scenic artist, Professor Chesney has been involved in over 80 set and costume designs for performances at the University of Waterloo and professional theatre across Southern Ontario. He was also chair of the Region of Waterloo Arts Fund and was involved in establishing co-op opportunities in the not-for-profit sector. His unmatched commitment to students, administrative contributions, and longstanding commitments to the wider arts community has brought significant credit to the University of Waterloo.

Dennis Huber (HM, Engineering & Environment)
Dennis Huber had served for more than two decades as Vice-President, Administration and Finance, making him the University of Waterloo's longest-serving senior administrator. Under his watch, the Waterloo's annual financial activity and its pension plan assets increased more than four-fold, and the University eliminated all externally financed debt, more than doubled the size of its facilities, and opened four satellite campuses. He also championed two campus master planning exercises that led to the interconnection of most buildings within the Ring Road, as well as successive improvements to outdoor spaces and the development of the David Johnston Research + Technology Park. As co-chair of the President's Advisory Committee on Environmental Sustainability (PACES), he helped accelerate the University's commitments to environmentally sustainable campus operations. Throughout his 36-year career, Huber's commitment to taking extra responsibilities, dedication to the university, and his incredible contributions have set the stage for lasting impacts on the Institution.

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