University of Waterloo
SENATE
Notice of Meeting

Date: Monday 20 June 2022
Time: 3:30 p.m.
Place: Microsoft Teams Videoconference

	OPEN SESSION		PAGE #
3:30	**Consent Agenda** **Motion:** To approve or receive for information by consent items 1-4 below.		
	1. Minutes of the 16 May 2022 Meeting	Decision	3

	2. Reports from Committees and Councils
	    a. Senate Graduate & Research Council
	    b. Senate Undergraduate Council
		Information
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	3. Reports from the Faculties	Information	13
	4. Committee Appointments	Decision	15
	Regular Agenda		
3:35	5. Business Arising from the Minutes		

3:40	6. Reports from Committees and Councils
	    a. Senate Executive Committee
	    b. Senate Graduate & Research Council
	    c. Senate Long Range Planning Committee
	    d. Senate Undergraduate Council
		Decision
		Decision
		Information
		Decision
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4:00	7. Report of the President
	    a. Strategic Plan Update - Research
	    b. President's Update
		Information
		Oral
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5:00	8. Report of the Vice-President, Academic & Provost
	    a. Teaching Assessment Processes Update
	    b. General Update
		Information
		Oral
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5:20	9. Report of the Vice-President, Research & International	Information	63
5:30	10. Other Busines		
	CONFIDENTIAL SESSION		
5:35	11. Minutes of the 16 May 2022 Meeting	Decision	7
5:40	12. Business Arising from the Minutes		
5:45	13. Reports from Committees and Councils a. Honorary Degrees Committee	Decision	69
5:50	14. Report of the President	Information	
5:55	15. Report of the Vice-President, Advancement a. New Gifts and Pledges $250,000 + (May 2021/April 2022)	Information	71

6:00	16. Report from the Vice-President, Academic & Provost nominating Committee*	Decision	
	17. Other Business		
	*Report will be emailed to Senators on the morning of 20 June 2022		

KJJ/dg
13 June 2022

Karen Jack
University Secretary
Secretary to Senate

Present: John Abraham, Jean Andrey, Marc Aucoin, Sandra Banks, Michael Beauchemin, Anne Bordeleau, Jeff Casello, Trevor Charles, Neil Craik, Kim Cuddington, Lori Curtis, Kristine Dalton, Laura Deakin, Charmaine Dean, Jack DeGooyer, David DeVidi, Nenone Donaldson, Catherine Dong, Benjamin Easton, Aiman Fatima, Paul Fieguth, Wendy Fletcher, Cindy Forbes, George Freeman, Mark Giesbrecht, Moira Glerum, Vivek Goel (chair), Onurcan Gokkaya, Rob Gorbet, Kelly Grindrod, David Ha, Kevin Hare, Dennis Huber, Natalie Hutchings, Sonia Ismail, Karen Jack (secretary), Narveen Jandu, Martin Karsten, Achim Kempf, Jennifer Kieffer, Veronica Kitchen, Christiane Lemieux, Xianguo Li, Kristina Llewellyn, Brad Lushman, Ellen MacEachen, Carol Ann MacGregor, Blake Madill, Ceileigh McAllister, Peter Meehan, Nasser Mohieddin Abukhdeir, Graham Murphy, Richard Myers, Beth Namachchivaya, Cathy Newell Kelly, Erin O'Connell, Daniel O'Connor, Troy Osborne, Douglas Peers, Nicholas Pfeifle, Luke Potwarka, Mary Robinson, James Rush, Naima Samuel, Matthew Schwarze, Marcus Shantz, Siv Sivaloganathan, Siva Sivoththaman, Chao Tan, Graeme Turner, Diana Vangelisti, Paul Ward, Dan Weber, Stan Woo, Changbao Wu, Annie Yang, En-Hui Yang

Guests: Jean Becker, Bruce Campbell, Aldo Caputo, Sam Charles, Lois Claxton, Tracelyn Cornelius, Katrina Di Gravio, Donna Ellis, Jenny Flagler-George, Barbara Forrest, Anne Galang, Amanda Garcia, Diana Goncalves, Mike Grivicic, Sarah Hadley, Shelley Hulan, Suzanne Kearns, Andrea Kelman, Nick Manning, Jennifer McCorriston, Kristiina Montero, Bessma Momani, Fayaz Noormohamed, Colleen Phillips-Davis, Ian Rowlands, Daniela Seskar-Hencic, Marianne Simm, Taydon Sinopoli, Allan Starr, Kerry Stryker, Sherri Sutherland, Brandon Sweet, Anita Taylor, Mathew Thijssen, Sean Thomas, Weber-Kraljevski

Absent: Dominic Barton*, Joan Coutu*, Lisa Bauer-Leahy, Scott Kline, Alysia Kolentsis, Robert Lemieux, Lili Liu, Glaucia Melo*, Oudy Noweir, Sharon Tucker, Clarence Woudsma*
*regrets

OPEN SESSION

CONFLICT OF INTEREST
Senators were asked to declare any conflicts they may have in relation to the items on the agenda; no conflicts were declared.

CHAIR'S REMARKS
The chair welcomed returning and new Senators to the first meeting of the governance year.

Consent Agenda

Senate heard a motion to approve or receive for information the items on the consent agenda.

Hare and Turner.

1. **MINUTES OF THE 18 APRIL 2022 MEETING**
   Senate approved the minutes of the meeting.

2. **REPORTS FROM COMMITTEES AND COUNCILS**
   Senate Graduate & Research Council
   Senate received the report for information.

   Honorary Degrees Committee
   Senate received the report for information.

   Senate Undergraduate Council
   Senate received the report for information.

3. **REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST**
   University Research Chairs
   Senate received the report for information.

4. **REPORTS FROM THE FACULTIES**
   Senate received the reports for information.

The question was called and carried unanimously.

Regular Agenda

5. **BUSINESS ARISING FROM THE MINUTES**
There was no business arising.

6. **REPORTS FROM COMMITTEES AND COUNCILS**
   Graduate & Research Council
   Casello spoke to the report and Senate heard a motion to approve the following Faculties joining the
   Collaborative Aeronautics Program (CAP), effective 1 September 2022: Arts and Environment
   (Master of Arts in Global Governance – Aeronautics); Environment (Master of Environmental
   Studies in Sustainability Management –Aeronautics, Doctor of Philosophy in Sustainability
   Management – Aeronautics, Master of Arts in Planning – Aeronautics, Master of Environmental
   Studies in Planning – Aeronautics); Engineering (Doctor of Philosophy in Systems Design
   Engineering – Aeronautics, Master of Applied Science in Systems Design Engineering –
   Aeronautics); Science (Master of Science in Vision Science – Aeronautics, Doctor of Philosophy in
   Vision Science – Aeronautics); Arts (Master of Arts in Psychology – Aeronautics).

   Casello and Andrey.

   Senate heard from Suzanne Kearns, director, Waterloo Institute for Sustainable Aeronautics about the
   program and the broad engagement across the University. The chair offered thanks to all who have
   been working on the initiative, and noted that it is an excellent example of the strategic plan in action.

   The question was called and the motion carried unanimously.

   Senate Undergraduate Council
   DeVidi briefly spoke to the report and Senate heard a motion to approve the proposed English –
   Creative and Professional Writing program, effective 1 September 2023.

   DeVidi and Peers.

   Peers noted the breadth of potential career outcomes for graduates, and Senate heard from Shelley
   Hulan, chair of the Department of English Language and Literature about the keen interest by
   students in the program, and its benefits for those who plan for a career in writing.

   The question was called and the motion carried unanimously.

7. **REPORT OF THE PRESIDENT**
   President's Update
   The chair provided an update on a variety of matters including: that there are no significant changes
   for the post-secondary sector in the recent provincial budget; news and activities since the last
   meeting; his recent statement on open and constructive dialogue; that the Senate Executive
   Committee's governance review continues apace and a report on the work, including

recommendations, will be ready for the June meeting of Senate; the long-range visioning exercise re: Waterloo at 100 that has begun; the in-person convocation ceremonies in June; the continued response to the pandemic. There were no questions.

President's Anti-racism Taskforce (P.A.R.T.) Report
The chair reminded Senators about the President's Forum being held on 19 May about the P.A.R.T. Report and encouraged members to attend. He invited Dean to speak to Senate about the taskforce's work and resulting report. Members heard about: the broad engagement by the whole community; P.A.R.T.'s membership, structure and approach; the work of the implementation teams and working groups; a summary of themes and recommendations; and from Senator Samuel, some personal reflections on her experiences on P.A.R.T., and from Tracelyn Cornelius, a staff member who is also a part-time student, about how she was inspired by the work to pursue further academic research and her PhD. In discussion: expressions of appreciation for the taskforce's work, and in particular, to Samuel and Cornelius for sharing their personal stories; how several recommendations in the "educational environment and the development of learners" section of the report are meant to help address economic inequities and that work on these recommendations is underway; the availability of scholarship about "different" or "other" ways of knowing for those who are interested; the transparent accountability framework being put in place.

Sustainability Update
The chair invited Mat Thijssen, director of sustainability to speak to sustainability activities at Waterloo. Senators heard about: support offered by his office; the governance structure; core documents and ongoing reports; some high-level indicators; progress risks; actions. In discussion: costs, and striking a balance with respect to immediate expenses and long-term benefits; beneficial outcomes that will come from the integrated planning review of the budget model for these commitments; agreement that accelerating the pace of this work is important.

8. **REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST**
Roster of Graduands
Senate heard a motion to delegate approval of the roster of graduands to the Executive Committee for its 6 June 2022 meeting.

Rush and Newel Kelly. Carried with one abstention.

Policy 45 Exception
Rush spoke to the report distributed earlier in the day regarding the recommendation from the Science Faculty Council to increase the membership of the upcoming Nominating Committee for the Dean of Science. Senate heard a motion to approve increasing the membership of the 2022 Nominating Committee for the Dean of Science by one to include seven regular faculty members.

Rush and Dalton. Following some discussion about how the policy can be revised, the question was called and the motion carried unanimously.

General Update
Rush provided Senate with a general update, including commentary about: the 2021 annual report from the library; a status update on the digital learning strategy; the teaching innovation incubator; the Wellness Collaborative; the budget and integrated planning review; the new Council of Academic Leaders.

In discussion: agreement to work with the student associations and the University colleges to ensure effective consultations occur with those groups for the digital learning strategy project.

9. **REPORT OF THE VICE-PRESIDENT, RESEARCH & INTERNATIONAL**
    Dean briefly reviewed the report distributed with the agenda and took the opportunity to offer kudos to Dr. Avery Broderick for his continued success with the Event Horizon Telescope Collaboration and the group's recent revelation of the first image of the black hole at the heart of the Milky Way galaxy.

10. **OTHER BUSINESS**
    There was no other business.

Senate convened in confidential session.

20 May 2022   Karen Jack
                                                        University Secretary

CONFIDENTIAL SESSION

The Confidential Session minutes have been removed.

The meeting was adjourned at 5:41 p.m.

20 May 2022

Karen Jack
University Secretary

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University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
Report to Senate
20 June 2022

Senate Graduate & Research Council met on 9 May 2022 and agreed, in accordance with Senate Bylaw 2 (section 4.03), to forward the following items to Senate for information as part of the consent agenda.

Further details are available at: *https://uwaterloo.ca/secretariat/committees-and-councils/senate-graduate-research-council*

FOR INFORMATION

ACADEMIC PROGRAM REVIEWS
On behalf of Senate council approved, as presented:
- Two-Year Progress Report: Global Governance
- Two-Year Progress Report: Theological Studies

CURRICULAR SUBMISSIONS
On behalf of Senate, council approved new courses and milestones, course revisions, course and milestone inactivations, and minor program revisions for the Faculties of Engineering (Electrical and Computer Engineering; Mechanical and Mechatronics Engineering; Systems Design Engineering), Environment (Environment, Resources, and Sustainability; Planning), Health (Kinesiology and Health Sciences; School of Public Health Sciences; School of Social Work), and Mathematics (Master of Mathematics for Teachers).

GRADUATE AWARDS
On behalf of Senate, council approved the Adosi Graduate Scholarship for Food & Agriculture (trust) and the Janet E.A. McDougall Scholarship in Pharmacy (endowment).

RESEARCH CENTRES AND INSTITUTES
On behalf of Senate, council approved the name change of Interdisciplinary Centre on Climate Change (IC3) to the Waterloo Climate Institute, as presented.

/mh kw Jeff Casello   Charmaine Dean
          Associate Vice-President, Graduate Studies and   Vice-President, Research & International
          Postdoctoral Affairs

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University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Report to Senate
20 June 2022

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Senate Undergraduate Council met on 10 May 2022 and agreed, in accordance with Senate Bylaw 2 (section 5.03) to forward the following items to Senate for information in the consent agenda.

Further details are available at: uwaterloo.ca/secretariat/committees-and-councils/senate-undergraduate-council

FOR INFORMATION

MINOR PLAN & CURRICULAR MODIFICATIONS
Council approved the following on behalf of Senate:
- minor plan changes for the Faculty of Engineering (architectural engineering, school of architecture, management engineering, management sciences option, complementary studies electives); Faculty of Environment (co-operative education requirements); Faculty of Mathematics (mathematical optimization/business specialization, math/business administration, math/information technology management, mathematics/financial analysis and risk management plan, mathematics/information technology management plan, mathematics/business administration plan, mathematical studies-business specialization, joint actuarial science, actuarial science minor); Faculty of Health; (co-operative education requirements); Faculty of Science (astrophysics minor, physics minor, co-operative education requirements).
- new courses for the Faculty of Mathematics (combinatorics & optimization).
- course changes for the Faculty of Engineering (school of architecture, Conrad school of entrepreneurship and business); Faculty of Mathematics (combinatorics & optimization, mathematics); Faculty of Science (aviation, pharmacy, physics).
- course inactivations for the Faculty of Engineering (complementary students elective).

David DeVidi
/twk   Associate Vice-President, Academic

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University of Waterloo
REPORT TO SENATE FROM THE FACULTIES
20 June 2022

FOR INFORMATION

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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].

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[1] https://uwaterloo.ca/secretariat/sites/ca.secretariat/files/uploads/files/june_report_all_fac.pdf

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University of Waterloo
SENATE
Report to Senate
20 June 2022

FOR APPROVAL

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Committee Appointment

Motion: To approve the following appointment:

- Senate Executive Committee: Julian Surdi (graduate student) as the Graduate student representative, term to 30 April 2023.

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University of Waterloo
SENATE EXECUTIVE COMMITTEE
Report to Senate
20 June 2022

This report is submitted following the committee's deliberations at its February through June 2022 meetings.

FOR APPROVAL
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At its meeting of 17 January 2022 Senate approved [Terms of Reference for a Governance Review](#) and mandated the Senate Executive Committee to oversee the review. Updates were provided on the progress of the review at subsequent Senate meetings. The Committee is pleased to present its [Final Report](#) on the Senate Governance Review it undertook through the winter and spring terms this year. Senators will find included in the report: an overview of the committee's discussions and findings, the results of consultations and the survey that included current and former Senators, a report from the external consultant who was engaged to assist the committee with key informant interviews and analysis of the survey, and a list of recommendations to improve Senate's governance. The appendices also include a chart indicating responsibility and the proposed timing for implementation of the recommendations.

Following discussion at the meeting, Senate is asked to consider the following motion:

> To endorse the Executive Committee's Senate Governance Review Report and its recommendations.

The committee looks forward to the discussion. Senators also are invited to send any questions they may have in advance of the meeting to the University Secretary.

Vivek Goel
Chair, Senate Executive Committee

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SENATE GRADUATE & RESEARCH COUNCIL
Report to Senate
20 June 2022

Senate Graduate & Research Council met on 9 May 2022 and agreed, in accordance with Senate Bylaw 2 (section 4.03), to forward the following item to Senate for approval as part of the regular agenda.

Further details are available at: *https://uwaterloo.ca/secretariat/committees-and-councils/senate-graduate-research-council*

FOR APPROVAL

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PROGRAM CHANGES

1. **Motion:** To approve the following Faculties joining the Collaborative Aeronautics Program (CAP), effective 1 September 2022, as presented[1].
   - Environment: Master of Arts in Geography – Aeronautics; Master of Science in Geography – Aeronautics; Master of Environmental Studies in Geography – Aeronautics; Doctor of Philosophy in Geography – Aeronautics.
   - Health: Master of Science in Kinesiology – Aeronautics; Doctor of Philosophy in Kinesiology – Aeronautics.
   - Mathematics: Master of Mathematics in Applied Mathematics – Aeronautics; Doctor of Philosophy in Applied Mathematics – Aeronautics.

   Rationale: Faculty research programs at the University of Waterloo are joining CAP—coupling their disciplinary expertise with a foundation understanding of aeronautics—as an additional offering to their existing and future thesis or major research paper-based Master's and PhD students. Participation requires the development of an academic plan that results in the CAP designation for students. The creation of the plan involves articulating the curricular elements including common curricular elements across the CAP, specifying research milestones, and ensuring other academic requirements result in the students achieving the desired collaborative program learning outcomes.

Faculty of Engineering

2. **Motion:** To approve updating the MEng in Electrical and Computer Engineering degree requirements to include one new Graduate Specialization in Business Leadership, effective 1 September 2022, as presented.

   Rationale: The Graduate Specialization has been designed to introduce students to the processes and best practices for leading technical teams, processes, and organizations in a North American business context. The key purpose of leadership is creating a framework for action. Doing this well requires an understanding of people, familiarity with the "language" of business which is finance, and disciplinary expertise. The Graduate Specialization supplements the expertise students develop in the ECE MEng program with the core skills needed to lead a business venture. Note: Students are not expected to have a background in business to take any of the courses.

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[1] See 16 May 2022 Senate (agenda item 6a) for faculties that have already joined CAP.

3. **Motion:** To approve a direct entry Co-operative program/option to the MEng in Electrical and Computer Engineering program., effective 1 September 2022, as presented.

    Rationale: The rationale for the addition of the co-operative program/option is as follows:
    - To facilitate MEng students in applying the knowledge they gained in their coursework.
    - Helps in professional development, networking and developing new collaborations.
    - Aligns with the University's and Province's vision and policy on "Work Integrated Learning."
    - Benefits in job search and placement of MEng students after completion of their programs.
    - Will attract the best applicants to the MEng in ECE program, as well as to other graduate programs.
    - Will allow international students to take up co-op jobs without impacting their Post Graduate Work Permit (PGWP).

Faculty of Environment

4. **Motion:** To approve adding a new Master's Research Paper with Internship study option to the Master of Environmental Studies in Social and Ecological Sustainability, effective 1 September 2022, as presented.

    Rationale: The MES in Social and Ecological Sustainability program has been generating a steady stream of high-caliber, multi-disciplinary Master's graduates for over two decades. In recent years, the program has been augmented by the establishment of a "Master's Research Paper" (MRP) study option with a view to responding to student demands for a highly focused and intensive program without undertaking the more traditional thesis study option stream. Student and employer market trends increasingly point to the desire for work-integrated-learning (WIL) approaches at the graduate student level giving rise to what we see as a significant opportunity to augment this graduate program with a renewed emphasis on providing MES MRP students in SERS with a well-supported and rewarding graduate WIL opportunity.

Faculty of Health

5. **Motion:** To approve changing the PhD and MSc program names to align with the following recent department and school name changes, effective 1 September 2022, as presented.
    - "Department of Kinesiology" to the "Department of Kinesiology and Health Sciences"
    - "School of Public Health and Health Systems" to the "School of Public Health Sciences"

    Rationale: Aligning degree designations with the recent department and school name changes will be more inclusive/reflective of the areas of research being undertaken by some current graduate students. The proposed changes would align with the breadth of research conducted by faculty members, which could assist with recruitment of future/prospective graduate students.

Faculty of Mathematics

6. **Motion:** To approve the discontinuation of the coursework study option from Master of Mathematics in Computer Science and the Co-operative Program, effective 1 September 2022, as presented.

    Rationale: Computer Science is requesting the discontinuation of the current MMath in Computer Science coursework study option. Due to student volume, the department is having to create more sections of course offerings, therefore requiring more faculty members to teach. In addition, the coursework students consume a significant amount of resources and financially, the current program is not sustainable.

/mh kw Jeff Casello
Associate Vice-President, Graduate Studies and
Postdoctoral Affairs

Charmaine Dean
Vice-President, Research & International

University of Waterloo
SENATE LONG RANGE PLANNING COMMITTEE
Report to Senate
20 June 2022

The Senate Long Range Planning Committee met on 13 May 2022 and agreed, in accordance with Senate Bylaw 2 (section 3.04b), to forward the following item to Senate for information as part of the consent agenda.

Further details about the committee are available at: https://uwaterloo.ca/secretariat/committees-and-councils/long-range-planning-committee

FOR INFORMATION

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WATERLOO AT 100

The committee participated in the first of several long-term visioning exercises for the university—receiving from the President and Vice-Chancellor, Dr. Vivek Goel, the invitation to examine and discuss what the institution aspires to become by its 100th anniversary in 2057. Goel provided an overview of the Waterloo at 100 webpage, including a futures framework, and posed 6 key discussion questions pertinent to the evolution and future shaping of the University, as presented.

Through considered reflection, the Senate Long Range Planning Committee identified elements fundamental to the question "*How Waterloo will evolve as an institution*?" These include:

- Addressing and prioritizing the impacts of many years of injustices through realizing a fully indigenized and decolonized institution (bringing reform to policy, scholarship, research, teaching, physical space, hiring practices).
- Increasing the value of the in-person experience; community building, emphasizing the grad/undergrad student experience, student-centred activities, work-integrated learning with external partnerships.
- Building agile/nimble infrastructure, including governance, that aligns with external branding and messaging.
- Envisioning future needs of individuals and society and pioneering responses thereon (flexible and individualized pathways, missions or disciplines vs majors, shorter-term credentials, lifelong learning, Alumni as expert resource pool).
- Increasing internal visibility to more comprehensively leverage interdisciplinarity (e.g., A.I., quantum, nano, and intersection with Health).
- Communicating core strengths more adeptly and impactfully.

The Senate Long Range Planning Committee committed to ongoing involvement in shaping and visioning Waterloo at 100.

/kw

James Rush
Vice-President, Academic & Provost

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University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Report to Senate
20 June 2022

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Senate Undergraduate Council met on 10 May 2022 and agreed, in accordance with Senate Bylaw 2 (section 5.03) to forward the following items to Senate for approval in the regular agenda.

Further details are available at: uwaterloo.ca/secretariat/committees-and-councils/senate-undergraduate-council

FOR APPROVAL

ACADEMIC PLAN INACTIVATION

Faculty of Science
Chemistry

1.   **Motion:** That Senate approve the inactivation of the Honours Chemistry, Biobased Specialization, effective 1 September 2023.

Background and Rationale: The Honours Chemistry, Biobased specialization was originally set up as part of a Joint Academic Exchange program with the University of Bordeaux. It first appeared in the 2015-16 Calendar. The specialization has had very few students – only 2 total. The Academic Collaboration Agreement expired on January 26, 2021. Thus, there is no need to have this specialization.

/twk

David DeVidi
Associate Vice-President, Academic

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Table of Contents

2020-2025 Strategic Plan Thematic Spotlights on Research

In our Senate meeting next week, we focus on the thematic area of Advancing Research for Global Impact within the institution's strategic plan. At the top of this item, we will hear from Charmaine Dean, Vice-President, Research & International, who will first provide a brief overview of the initiatives underway across the Research theme. We then take the opportunity as in past cycles for a deep dive into a specific initiative area. Karim S. Karim, recently appointed Associate Vice-President, Commercialization and Entrepreneurship will present the mission, vision, goals, and key activities of UW's Office of Commercialization and Entrepreneurship situated within the portfolio of the Vice-President, Research & International. The Office is a key driver for realizing the second of three goals under the Research theme of our strategic plan; namely, **to propel Waterloo's global leadership in innovation, entrepreneurship, and social impact**.

As noted in past cycles where we engage with our institution's current strategic plan, it is not possible to feature all initiatives under our plan's thematic areas. In the case of Research, those pertaining more directly to goals one and three (listed below) will be spotlighted in future cyclical engagements with the strategic plan as well as through a meeting in Fall where we focus on the progress of all the entire strategic plan.

The Research theme of our strategic plan is defined through three goals. This briefing is concerned with the Office of Commercialization & Entrepreneurship and its function to address goal R2.

Advancing Research for Global Impact

R1 Waterloo will use its disciplinary and interdisciplinary strengths to solve increasingly complex, real−world problems.

R2 Propel Waterloo's global leadership in innovation, entrepreneurship and social impact.

R3 Achieve greater research impact by leveraging Waterloo's partnerships.

Please find below broad questions for consideration as you engage with the reading in addition to separate inputs and questions you will bring to the discussion.

Discussion questions

1. Are there additional opportunities to focus on the needs of our ecosystem in developing this framework for support of entrepreneurship and commercialization?

2. Are there additional opportunities to focus on needs of our students?

3. Considering the importance of social impact of Waterloo's research and talent development, how should we engage with the UN Sustainable Development Goals?

4. Are there specific metrics (in addition to our commitments to federal and provincial governments) that we should consider?

5. How could alumni engage with and support the Waterloo Warrior Fund and broader activities supporting student entrepreneurship?

6. How can we drive excitement to inspire someone to become a philanthropist or investor?

>>>>

The Office of Commercialization & Entrepreneurship

1   Vision

The Office of Commercialization and Entrepreneurship is the focal point that makes Waterloo the acknowledged leader in all aspects of innovation, entrepreneurship, and commercialization in Canada and will enable innovators, founders, and others to thrive and succeed.

2   Mission

The Mission of the Office of Commercialization & Entrepreneurship is to build on Waterloo's existing foundation of innovation, entrepreneurship, commercialization – supporting and encouraging members of our community to innovate and build using their creativity.

3   Key Pillars

The Office of Commercialization and Entrepreneurship is a mechanism to better coordinate related units and initiatives on campus to broaden our support to the diverse needs of campus innovators.

There are three key pillars of activities in the Office of Commercialization and Entrepreneurship: (1) **WatCo** focuses on supporting innovation and the path to commercialization; (2) **Velocity** sets entrepreneurs up for success; and (3) through **Thought Leadership** the Office is advancing Waterloo as a leader and innovator. Each are expounded below. A cross-unit initiative is the Translation program, which is meant to be a cornerstone activity where WatCo and Velocity have good overlapping supports to begin our collaboration efforts, with an initial focus on graduate student entrepreneurial activities.

3.1   WatCo

The Waterloo Commercialization Office (WatCo) provides commercialization support primarily to the UW research community. This includes management of intellectual priority portfolios,

education on intellectual property, de-risking prototype development funding support, and executing licensing and startup strategies with innovators.

WatCo's priority areas include:

- Implementing Waterloo's obligations under the Provincial "IP Action Plan" Commercialization Mandate Agreement.

- Building an ecosystem that supports entrepreneurial communities through consideration of principles of equity, diversity, and inclusion.

- Engaging alumni in the ecosystem, through accessing their expertise and time, in trial discussions with Advancement on programmatic and communications approaches.

- Aligning the Warrior Fund and Cognition Fund (which is currently focusing on "deep tech" opportunities that arise from Waterloo's research community).

3.2   Velocity

Since its inception, Velocity has focused on supporting startups during the riskiest and earliest time of business building. Our 14 years of experience allowed us to learn from founders and discover the most effective ingredients for success: a fast and transparent fundraising process, supplying founders with connections, practical and authentic business expertise, a deeply supportive community, space to build a team and develop products, and risk-tolerant capital.

No. of current teams/start ups	% of teams targeting SDGs	Technologies commercialized since 2020	All-time no. of companies	Jobs created	Total capital raised
67	76%	25	>420	>5,000	$4.2B

With our deep focus on founders and students, we are seeing shifts in why people are choosing to build a company and how they would like to do it. Entrepreneurs are changing:

- They care about positive and significant change in the world more than they care about building wealth for themselves.

- Their relationship with work is changing. Work is a tool to create positive change, not a thing that they must do for someone else.

- We are entering a time of great challenges, global conflict, and scarcity - entrepreneurs are more engaged than ever in these issues.

- Entrepreneurs seek to find ways for a more harmonious relationship between the advancement of technology and our humanity.

- Entrepreneurs build because they do not see their needs and the needs of their futures being met by the corporations and governments of the world.

In response to these changing needs, Velocity is:

- Now measuring ourselves not only by financial outcomes but by positive global impact

- Embracing the momentum toward work flexibility

- Increasing our scope beyond the Waterloo Region

- Instilling equality, diversity, inclusion, and anti-racism into the highest levels of our processes

- Building a team of experienced entrepreneurs who bring empathy to new founders

- Meeting the most significant needs of founders on their terms

More specifically, Velocity aims to amplify both local and global impact by helping our region's founders and innovators achieve global recognition and market share, and bringing global perspectives and a vetted, principled network of investors and other supports to Waterloo. Via the Velocity fund, Waterloo can create unique engagements with Waterloo founders locally and abroad, foreign ecosystems, and develop know-how on how to help founders build companies with global presence and influence.

3.3   Thought Leadership

Our objective is clear: Waterloo will become recognized worldwide as a pre-eminent thought leader in innovation, commercialization, and entrepreneurship.

Building on our foundation in the practical aspects of innovation, commercialization, and entrepreneurship, we will engage our community in more structured thinking and inquiry on the frameworks that inform these topics. We will engage in pure and applied research, communications and branding Waterloo, engaging with policy makers, and being participative and present in conversations on the topic of innovation, commercialization, and entrepreneurship across Canada and around the world.

In the short term, we will do this by:

1. Striking a council/task force to identify opportunities and chart the path forward

2. Implementing thought leadership initiatives

3. Iterate: evaluate initiatives, discontinue those that are not performant, and develop new ones in their stead

Some initial initiatives that we are considering include establishing or engaging:

- Council for Innovation Policy and Strategy

- Canadian Innovation Conference (scholars, practitioners, & policymakers)

- National Innovation Awards (invention, start-up, industry, policy)
- UW Innovation Lectures (like the [Massey lectures](#))
- Establish Chairs in innovation, commercialization, and entrepreneurship

To ensure sustainability of these initiatives, we are considering potential sources of funding for thought leadership programs.

4   Goals

Short Term:

- Establish Warrior Family of Funds Trust
- Establish Thought Leadership Council
- Revise and formalize current vehicles by which entrepreneurship units on campus outside the Office of Commercialization and Entrepreneurship coordinate activities
- Establish Social Impact Structure
- Innovation Arena – Phase 1 (physical upgrade and Velocity move into Innovation Arena)

Mid-term:

- Innovation Arena – Phase 2 (Establishment of partnerships within Innovation Arena)
- Establish External Advisory Council

Longer-term:

- Develop global leadership in defining measures of the impact of entrepreneurship
- Develop and expand the scholarly environment to support thought leadership in innovation, commercialization, and entrepreneurship

5   Impact & Value

- Enriched and differentiated entrepreneurial skill building opportunities for undergraduate and graduate students that enhances recruitment, employability, and entrepreneurial career path choices.

- Driving Region of Waterloo/Ontario's job and wealth creation from startups that are positioned and capitalized for success from Waterloo's Office of Commercialization and Entrepreneurship programs.

- Positioning Waterloo as a global leader in commercialization and entrepreneurship thought leadership that supports student recruitment and global rankings.

Assessment of Teaching: Overview
Update to Senate, June 2022

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Contents

Overview: Teaching Assessment Processes

The University of Waterloo has been at work on improving its processes for the assessment of teaching for many years, at least since the launch of (what is now known as Phase 1 of) the Course Evaluation Project (CEP) in 2014. Since the launch of Phase 2 of the CEP in late 2017, there have been regular reports to Senate about the progress of these efforts. For the past few years, these reports have occurred early in Spring Term.

Over time, these efforts have grown beyond the original focus of the CEP Teams (CEPT) of improving the quality of what are now usually referred to as Student Course Perception (SCP) surveys, though further work on the SCPs continues. Additional projects are underway on campus to:

- Develop useful and feasible methods for gathering information about teaching that is *complementary* to that which can be gathered from SCPs. (This is the work of the Complementary Teaching Assessment Processes Team (CTAPT)).
- Develop a *teaching effectiveness framework.* In response to the work of CEPT and CTAPT, it became clear that best practice in assessment of teaching involved identifying a (Waterloo-specific) *teaching assessment framework*. When Senate first endorsed the development of such a framework in 2020, it was referred to as a "definition of good teaching." In ensuing consultations, it became clear that this terminology is misleading: the point is to identify aspects of teaching that are simultaneously important and valued aspects of good teaching to both instructors and students at Waterloo and consistently identified in the research literature on teaching and learning as important aspects of effective teaching. Such a framework can identify aspects of teaching that the University values and hopes to incentivize. It can also help clarify what the appropriate uses of different sources of information about teaching can be when assessments of teaching performance are carried out. For instance, no single tool provides useful assessment of all the valued aspects of teaching included in the framework, so having the framework in place can help prevent over-reliance on any one source (such as the SCP).
- Develop methods for assessing the *quality* of graduate supervision. The Office of Graduate Studies and Postdoctoral Affairs is leading a process to develop such methods, with the hope that there might be systematic sources of useful information beyond just numbers of students supervised by a given faculty member.

As these various projects have progressed, the need for a further project becomes clear. It is obviously a good thing to provide various sources of relevant information to those tasked with the assessment of teaching performance. But it is not obvious how these different sources of information ought to be combined into a single assessment. While it is to be expected that there will be local differences in how the different sources of information are used due to, for instance, differences in modes of teaching in different programs, the amount of graduate supervision done by faculty members in different units, and so on, it would not be appropriate

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for the use of different sources of information to vary arbitrarily (e.g., changing on a whim when a new department chair is appointed). Therefore:

- The University will soon launch a working group to develop appropriate guidance for how the various sources of information about teaching performance should be used in arriving at holistic assessments of teaching performance for individual instructors.

Reports on the areas of teaching assessment where there have been the most important developments in the past year are included below:

- An update on the progress of work on Student Course Perceptions.
- An extensive summary of the work of CTAPT, including its recommendations with respect to two mechanisms for providing information relevant to assessment of teaching, namely *Peer Reviews of Teaching* (PRT) and *Teaching Dossiers*. (There will be a presentation with respect to the recommendations for PRT at the Senate meeting.)
- The working version of the Framework for Teaching Effectiveness is presented. The framework is the joint work of Teaching Assessment Processes Office (building on years of work by the CEPT) and CTAPT and is the product of several rounds of consultation with the campus community, including both student and instructor consultations.

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Update: Student Course Perceptions

Background: History and progress to date

For several years, the University of Waterloo has been working to upgrade its teaching assessment processes. The goal is a profound shift toward a holistic model that gathers relevant evidence from a variety of sources that are relevant to different aspects of good teaching, including Student Course Perceptions, Peer Reviews of Teaching, and Teaching Dossiers, and that takes into account evidence relating to high quality graduate supervision. This new system is being developed with an eye to the research literature, Waterloo-specific research, consultations with campus stakeholders, and the experiences of other Canadian universities.

For the past several years, updates have been provided to Senate annually in the Spring. We list here a few key developments with respect to Student Course Perception (SCP) surveys to provide context for other materials included in this year's Senate update.

Core questions

- In June 2020, Senate endorsed the new Student Course Perception survey (core questions) and approved a motion to have the survey replace existing surveys as the method of collecting data on student perceptions of their learning experience in their courses.
- While the original plan was to launch the new SCP survey in Fall 2020, the launch was delayed due to the impact of the pandemic. The decision of senior academic leadership was to delay the launch until we returned to mostly on-campus activities.
- Prior to launch, Sonya Buffone, Director of Teaching Assessments Processes (TAP) met with several campus groups (including Deans Council, UOPS, Teaching Fellows, Academic Leadership, FAUW, etc.) to discuss the launch of the new SCP instrument.[1]
- The new SCP instrument (core questions only) launched in Winter Term 2022. A large-scale data analysis of the results is in progress.
- Two user guides have been created (one for academic administrators and one for instructors) to help understand and guide interpretation of the new SCP survey.[2] These documents are now live-available as one downloadable pdf and also accessible as online "tools." The intention is for these guides to be living documents, revised over time in response to feedback from the campus community so they will be as useful as possible.
- The TAP office has created surveys to obtain feedback from campus stakeholders on their experiences with the guidebooks and the new data report for the SCP survey.[3]

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[1] View the full timeline for consultations activities here: Timeline
[2] Access the guidebooks here: Academic Administrator Guidebook and Instructors (note, pdf versions are available).
[3] Access the surveys here: Academic Administrator Survey and Instructor Survey

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Cascaded Model: Additional tiers of survey questions

- As noted in the June 2020 report to Senate, Deans Council endorsed a "cascaded model" for further development of the SCP survey. The idea is that each Faculty will engage in a consultative process to develop an appropriate second tier of questions to be asked in every course in that Faculty; further tiers (for departments or programs, and perhaps for formative-only course-specific questions) will be developed later. The Cascaded Model was also endorsed by Senate at that meeting.
- While Covid-19 slowed progress, this process is complete in Environment (approvals pending), nearly complete in Engineering, and about half-way in Health and Math. The process is expected to begin in Arts and Science sometime in Fall 2022. Sonya Buffone, TAP Director, continues working with Gordon Stubley, former Associate Dean, Teaching (Engineering) and a 3M Teaching Fellow, on this part of the project.

Ongoing research into the performance of the SCP survey

Responses to open-ended questions:
- Also at the June 2020 Senate meeting, the need to reconsider the rules and practices at the University with respect to using answers to open-ended questions in the assessment of teaching was flagged. The TAP Office has been working towards gathering evidence that will allow sensible decisions to be made on this matter.
- In light of consultations with the EDI-R office and other stakeholders, the AVPA has concluded that before making further decisions on this matter, it will be useful to carry out a research project to assess the qualitative comments students provide when completing the SCP survey. The TAP Director has drafted a research proposal to study responses to open-ended questions. The goal is for the analysis to take place in Winter 2023, anticipating that by then we may have a term that comes close to the new post-pandemic normal. The results of this research project will help guide decisions about:
  - Who should have access to the responses
  - What instructional material will help students provide helpful and appropriate comments
  - How such comments can be appropriately used for summative and formative assessments of teaching (e.g., should administrators see the responses, as is considered best practice by most? Should there be a process to remove inappropriate comments, and if so, how would it operate?)

An overview of analysis of the new SCP data
- In advance of the decision to adopt the new SCP survey, the University carried out a massive pilot test (Fall 2018). When the decision was taken, the University committed to ongoing monitoring of the performance of the SCP survey over time.
  - Responsibility for this ongoing work has been assigned to the Teaching Assessment Processes office. As with the pilot test, this research is being carried

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out as a collaboration between the Director of TAP and the Statistical Consulting and Collaborative Research unit in the Faculty of Mathematics.

Key aims of analysis include:

- Examining the relationship between SCP scores and predictive variables (e.g., gender, class size, race etc.). The choice of which variables to test was determined by:
  - ❖ the results of the 2018 pilot test
  - ❖ considering which variables are most often pointed to in the research literature as influencing SCP scores; and
  - ❖ considering which variables would be of most interest to the University of Waterloo campus community.
- Examining the relationship between SCP scores and racial identity. Data about racial identity of instructors was unavailable at the time of the 2018 pilot test. To carry out this analysis an appropriate data sharing agreement was reached with IAP to allow sufficient access to Equity survey data necessary to complete the analysis while ensuring appropriate confidentiality controls are in place.
- Examining the performance of the survey questions in general. This includes such matters as looking for trends or patterns that may illuminate potentially problematic questions (e.g., if a particular item has a high frequency of n=9 "no basis for rating," then it is possible that the question may be a source of confusion for students).

Update: Complementary Teaching Assessment Project Team (CTAPT)

The Complementary Teaching Assessment Project Team (CTAPT) was formed in Winter 2018. The purpose of CTAPT is to research and develop methods of assessing teaching and to provide recommendations that are useful for both formative and summative assessment, based on empirical evidence and consultation with the University of Waterloo community. The focus of CTAPT is to recommend methods in addition to Student Course Perception Surveys that should be used campus-wide.

CTAPT Phase 1 (2018 to 2020)

The membership of Phase 1 of CTAPT was assembled jointly by then FAUW Vice-President Shannon Dea and then AVPA Mario Coniglio. CTAPT presented an interim report to Senate in Spring 2020, which included the following recommendations:

Recommendation #1: Continue to enhance culture of teaching

The University of Waterloo's mission is to advance learning and knowledge through teaching, research, and scholarship, nationally and internationally, in an environment of free expression and inquiry. CTAPT recommends that Waterloo institutionally commits to continuing to raise the prominence of teaching, improving the culture around teaching, and advocating for supporting and increasing the quality of teaching in all of its forms. Effective performance evaluation is one example of how we can make this commitment.

Recommendation #2: Adopt comprehensive definition of teaching effectiveness

CTAPT recommends that the University of Waterloo officially adopts a definition of teaching effectiveness. This definition should be a "living definition" that is evaluated and, if necessary, updated regularly by an appropriate cross-campus body. Having such a definition officially adopted will provide clarity and transparency around the question of "What are we assessing?"

Recommendation #3: Officially incorporate multi-faceted assessment

CTAPT recommends that the University of Waterloo adopts the use of Teaching Dossiers, Peer Review of Teaching, and Student Course Perception Surveys as campus-wide, multi-faceted processes of teaching assessment. Each of these methods is useful for formative feedback, which will help make the quality of teaching at Waterloo even better and provide opportunities for innovation and professional growth for faculty members. Furthermore, the use of multiple methods of assessment, appropriately implemented for summative assessment, can both help to reduce bias in the process as well as to improve triangulation of information.

Recommendation #4: Provide opportunities for non-faculty instructors to have their teaching assessed

While the focus of CTAPT's conversations has been on formative and summative assessment of teaching done by regular faculty, there is a vast amount of teaching done at Waterloo by

instructors who are not regular faculty (e.g., adjunct faculty, sessional instructors, postdoctoral fellows, graduate students, lab and staff instructors, etc.). CTAPT recommends that the structure implemented for formative and summative assessment of the teaching done by regular faculty be also implemented for formative assessment of instructors who are not regular faculty when possible.

These recommendations were unanimously endorsed by Senate. At that time, Senate also endorsed continued CTAPT work to develop meaningful and feasible mechanisms for Teacher Dossiers and Peer Review of Teaching.

CTAPT Phase 2 (2021 to 2022)

Phase 2 of CTAPT launched in March 2021. Membership was jointly agreed to by AVPA David DeVidi and by then FAUW President Dan Brown, and included representation from all six Faculties, from the AFIW, from CEL, and from CTE. Membership of CTAPT, Phase 2:

- Donna Ellis, Centre for Teaching Excellence (CTE)
- Denise Marigold, Social Development Studies (Renison)
- J.L. (Jay) Michela, Psychology
- Elena Neiterman, School of Public Health Sciences
- Cynthia Richard, Pharmacy
- Manoj Sachdev, Electrical and Computer Engineering
- Su-Yin Tan, Planning / Geography and Environmental Management
- Ian VanderBurgh, Centre for Education in Mathematics and Computing (Chair)
- Pia Zeni, Centre for Extended Learning (CEL)

The Terms of Reference for Phase 2 of CTAPT included:

- developing and recommending feasible and meaningful processes for implementation of Teaching Dossiers and Peer Review of Teaching as routine parts of the assessment of teaching for regular faculty members at Waterloo. These processes need to provide reliable information about the elements of teaching effectiveness as eventually adopted by the University. These processes also need to be sustainable, including with respect to the time, effort, and willingness of colleagues to play the roles required of them, and in terms of the resource implications.
- consulting and communicating with the campus community, in collaboration with others (including the AVPA and other committees working on assessment of teaching), to prepare the ground for broad acceptance of these processes when they are launched. CTAPT's next report should make references to common concerns about Teaching Dossiers and Peer Review of Teaching and how the recommendations provided address these.
- coordinating the creation of toolkits to support the processes for Teaching Dossiers and Peer Review of Teaching. For both Teaching Dossiers and Peer Review of Teaching,

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these should ideally build upon resources already existing on campus in various Faculties and units.

- providing recommendations about how these processes might be extended to other instructors at Waterloo, including sessional instructors, short term contract instructors, staff instructors, and graduate student instructors.

This report summarizes the work of Phase 2 of CTAPT, and includes:
- **details on the mechanisms that we recommend be adopted by the Faculties,**
- **the commitment that this will require, and**
- **details about consultations undertaken by CTAPT and, embedded throughout, our responses to concerns raised through these consultations.**

Summary of Recommendations from CTAPT Phase 2

CTAPT recommends the following regarding Teaching Dossiers (TD) and Peer Review of Teaching (PRT):

- *A common mechanism for summative PRT.*

  This mechanism balances the need for meaningful feedback from reviewer to instructor with the need for a feasible structure that would work across the University. As the details later in this report indicate, we recommend that tenured/continuing faculty participate in summative PRT every 8 years and pre-tenure/pre-continuing faculty participate every 2 years.

- *Expanded use of existing mechanisms for formative PRT.*

  Effective models of various kinds exist across campus (e.g. "reciprocal pairs" and "teaching squares"). CTAPT hopes that the promotion of these models will lead to expanded uptake.

- *A common format for collecting teaching information on Annual/Biannual Performance Review (APR/BPR) forms.*

  We believe that this is better viewed as a "Description of Teaching" rather than a "Teaching Dossier". We anticipate that a typical submission using this format would be 2 to 3 pages long, and would include factual information (e.g. lists of courses taught, supervision undertaken, etc.), reflective narrative, and commentary on results from Student Course Perception Surveys (SCPS) as well as from PRT, and will encourage faculty to relate their commentary to the University's Framework for Teaching Effectiveness.

- *A common format that could be used for faculty when applying for Tenure and Promotion.*

This "focussed" Teaching Dossier format (4 to 8 pages plus Appendices) would help guide faculty in their submission for T&P. This format is aligned with the APR/BPR format, to allow faculty to refer back to recent submissions for examples and commentary.

CTAPT recognizes that while there is value in having formats and mechanisms that are somewhat "common" across campus, it is also crucial that Faculties adapt these mechanisms, in consultation with the Office for Teaching Assessment Processes (TAP), to suit their disciplinary needs and practices. CTAPT also recognizes the administrative overhead of implementing these mechanisms and has already participated in conversations about how we might best find efficiencies to minimize this overhead.

Before proceeding to look at these mechanisms in detail, it is important to re-iterate why we are undertaking this work in the first place:

- At the University of Waterloo, summative assessment of faculty members is part of our regular practice at all times through our careers.
- In order to do this assessment fairly, equitably, effectively, and consistently, review committees need an understanding of what effective teaching is. To address this, the University has created a Framework for Teaching Effectiveness, which, while giving review committees a better conception of what to look for, can also more importantly give instructors ideas on how to improve their teaching, which in turn can enable students to improve their learning.
- Review committees also need to have information and data on which to base their scoring decisions. While Student Course Perception Surveys do and should measure parts of effective teaching, they cannot measure all aspects of effective teaching and have some well-established issues. Thus, additional mechanisms are needed to assess teaching.
- Teaching Dossiers allow faculty members to contribute to this assessment by providing factual information and offering an opportunity to reflect on their practice and on any concerns that they might have regarding their teaching context or mechanisms used for assessment.
- Peer Review of Teaching adds information from direct observation to the teaching assessment process, complementing the self-reflection from the Teaching Dossier and the student perspective from SCPSs.

Combining these mechanisms throughout the career of a faculty member (both for pre-tenure/pre-continuing and for tenured/continuing faculty) along with assessments of graduate supervision will empower faculty members to take ownership of the assessment of their teaching while maintaining the rigour of the assessment process at all stages of an academic career through the triangulation of multiple sources of evidence.

Summary of Mechanisms Recommended

Summative Peer Review of Teaching
- Recommendation of structure and format to be adapted by Faculties for regular use at all stages of academic career
- Tenured/continuing: once every 8 years; pre-tenure/pre-continuing: once every 2 years
- Pool of peer reviewers carefully chosen in each Faculty and trained
- Peer reviewers receive appropriate teaching or service credit
- Structured and transparent process tied to University framework for teaching effectiveness that also gives reviewee opportunity to seek specific feedback of interest
- Template provided to reviewer to aid in observation, note-taking and report writing
- Reviewer produces report that includes qualitative comments, not quantitative score

Formative Peer Review of Teaching
- Recommendation to take more advantage of models already existing on campus
- No expectation of written report or submission to unit head/review committee
- Participation should be encouraged and recognized as professional development towards teaching

Teaching Dossiers for APR/BPR
- Recommendation of format to be adapted by Faculties for inclusion in APR/BPR forms
- Provides agency to faculty members to bring to light the teaching work that they do and increased opportunity to contribute to their assessment
- Includes factual sections (e.g. lists of courses, supervision, professional development), explicit opportunity to comment on contextual factors of teaching, and opportunity for reflection
- Typical submission from faculty member expected to be 2 to 3 pages long

Teaching Dossiers for T&P
- Recommendation of format that faculty members could adapt to use when submitting T&P packages
- Provides guidance to faculty members and framework to collect and present appropriate evidence
- Would provide consistency for T&P committees
- Includes details of teaching responsibilities, teaching statement, evidence of teaching effectiveness, goals, appendices to support
- Typical submission from faculty member expected to be 4 to 8 pages long

The consideration of summative peer review of teaching took the largest amount of time in CTAPT's work because of the care needed to create a meaningful and feasible structure, and because of the number of details involved in such a structure. We begin with a high-level

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summary of a recommended process; finer details are omitted from this report but would be part of a future implementation.

Frequency
- Pre-tenure/pre-continuing: every 2 years on average
- Tenured/continuing: every 8 years on average (could be done more frequently in some units or by request)
- When process is initialized, tenured/continuing faculty to be randomly assigned in each Faculty into four two-year windows
- Newly tenured/continuing faculty assigned on a rolling basis to furthest window post-tenure

Peer Reviewers
- Must be Continuing Lecturer, Associate Professor or Professor with demonstrated commitment to teaching and seen as collegial
- Peer reviewers appointed for 3 years and receive extensive training on a number of aspects
- Nominations made to Unit Head; new reviewers chosen at Faculty level to ensure diversity of pool, variety of perspectives, commitment to teaching, collegiality, balance of ranks
- Receive Service or Teaching credit at APR/BPR time; to be decided within each Faculty
- Each reviewer does 6 to 8 PRT per year; expected hours per year per reviewer: 80 (= 5% of FTE)
- Reviewer normally chosen from inside Faculty outside unit; reviewee receives short list of appropriate reviewers and asked for any exclusions from list (e.g. for reasons of conflict of interest); reviewer chosen at Faculty level
- Reviewee can choose to have reviewer from outside Faculty in consultation with Unit Head

Process
- Reviewee determines course to be reviewed; reviewer is assigned
- Reviewer and reviewee have a pre-review meeting (30 minutes)
- Reviewer given access to appropriate platforms (e.g. LEARN, Piazza, Slack, Crowdmark)
- Reviewer uses PRT Report Template plus additional direction from instructor (gives reviewee opportunity to highlight specific positive things as well as to ask for feedback on specific things)
- Reviewer reviews materials including, but not limited to, course outline, asynchronous learning materials, assessments, communication, usually but not always including synchronous component(s) (3 to 5 hours)
- Reviewer writes preliminary report (2 to 3 hours)

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- Reviewer and reviewee post-review meeting (30 minutes); reviewer gives specific formative feedback, asks for clarification on items for report
- Reviewer finalizes report (1 hour)
- Report should be explicit about which dimensions of Teaching Effectiveness could not be addressed
- Reviewer submits report to faculty member, Unit Head, and PRT administrator
- Reviewee has 30 days to write a response to be attached to official PRT; based on response, Unit Head and Dean in consultation can delete the review if it is deemed problematic and decide in consultation with Reviewee whether to have a new review done or wait until the next designated window
- Two reviewers could be assigned to do PRT together in specific "high stakes" situations
- Total time for reviewer per review: 7 to 9 hours; total additional time for reviewee: 1 to 3 hours

Special Cases
- The Dean (in consultation with Unit Heads) can waive PRT for up to a portion (say, 10%) of faculty members in a given review cycle for reasons of extenuating circumstances, significant reductions in teaching, etc.
- The Dean (in consultation with Unit Heads) can request a second summative PRT for a portion (say, 5%) of faculty in a given review cycle.
- A faculty member and their Unit Head can request a second summative PRT.

Training and Administrative Support
- Training of several kinds will be needed, which a unit like CTE could contribute to:
  - For peer reviewers: effective performance of peer review, avoidance of pedagogical bias, understanding of collegiality and power dynamics, observation of dimensions of teaching effectiveness
  - For review committees: understanding and interpretation of peer reviews
- This process will need administrative support. The Deans have agreed that some of the purely administrative support should be housed in the Office of Teaching Assessment Processes in order to create efficiencies across campus.

Data
- Based on the model above and using current faculty head counts, we project that Faculties will need to undertake between 25 and 85 summative peer reviews per year, depending on the size of the Faculty.
- Based on this data, we recommend peer reviewer pool sizes of between 5 and 15 reviewers, depending on the size of the Faculty, with each reviewer doing roughly 8 summative PRTs per year. (The pool size for smaller Faculties has been increased beyond what the data suggests in order to achieve extra diversity within the pool.). Faculties may want to consider having even larger pools.

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- Across the institution, we estimate 340 peer reviews per year, which corresponds to a total of approximately 2 FTEs of reviewer time institution-wide.
- We estimate 4 to 6 hours of training for each new reviewer. This training would replace 1 PRT in their first year as a reviewer.

Review Guidelines and Report Template

Along with the process detailed above, CTAPT has created guidelines and a template that we recommend for summative PRT. Faculties may wish to adapt these materials, in consultation with the Office of Teaching Assessment Process, for their use. It is CTAPT's belief that a more robust set of guidelines and template will create more consistency between summative peer reviews and will also reduce the burden of training.

The template itself that follows is tied directly to the University Framework for Teaching Effectiveness. One goal of the template is to encourage a balance of positive comments and constructive feedback.

We note that the reviewer is to produce a qualitative report, *not* a quantitative summary. Meaningful commentary is the most useful to instructors for improving teaching, and the fact that a score/rating is not required should create better collegiality and produce more honest comments. The score is thus left to APR/BPR committees, who will be trained to look at the whole picture across multiple instruments.

CTAPT's recommended review guidelines and report template includes:

1) Instructions
   - One to two pages
   - For reviewer and reviewee, including structure for pre- and post-observation meetings

2) Instructor Input Form
   - One to two pages
   - Includes course information, where reviewers should look, what reviewers could look for
   - Specific requests/goals: "*Instructors are encouraged to draw on information/feedback that they have (e.g. self-reflection, previous PRT reports, SCP numerical results and comments). If instructors feel that sharing such source information with the reviewer is helpful, they should feel free to do so; if instructors would prefer to not share the source information, this is also completely acceptable.*"

3) Reviewer Note-Taking Template
   - Three pages: one for each of Implementation, Design, Learning Experience
   - Each page lists a number of specific actions from the Framework for Teaching Effectiveness for which reviewers could look, and leaves space for notes

- Reviewers are encouraged to focus on a small number of actions in their review and report, rather than trying to observe as many of these as possible, and to be sure to do the review with the instructor's goals or specific requests for feedback in mind.
- Reviewers would use the various items as a guide of what they might see, but should consider the review holistically rather than focussing too much on these lists.
- Reviewers should identify a small number of specific items that they feel that the instructor is doing well that can later be fleshed out in the report.
- Reviewers should identify a small number of specific items that they feel that the instructor could improve upon, or that are missing entirely. Items that are apparently less important or that are impossible to observe should be ignored by the reviewer rather than treating them as needing improvement.

4) Reviewer Report Template
- Goal: written report that is roughly one to two pages in length
- Report needs to include enough detail so that a third-party (e.g. review committee, awards committee, hiring committee) can read and understand it.
- Items to include
  - Contextual information: course, term, timeline, unusual circumstances (if any), etc.
  - (Optional) Positionality – what reviewer does/does not feel qualified to comment on
  - List of course components observed
  - List of specific things on which the instructor requested input
  - Strengths observed (drawn from Implementation, Learning Experience and/or Design)
  - Areas for growth (drawn from Implementation, Learning Experience and/or Design)
  - Overall comments
- Responsibilities of Reviewee
  - Assist in correction of factual issues during post-observation meeting
  - (Optional) Reflective response to accompany final report, including clarifications and new goals for teaching

While this process and documentation will take some time to read, digest and understand, CTAPT believes that when taken together, the process, guidelines and template create an implementation of summative peer review that is adapted for the Waterloo context, and balances providing meaningful feedback with creating a feasible structure. Time will of course be required – administratively, for reviewees, and for reviewers – but this time will be well-spent and will also contribute to the enhancement of the culture of teaching, to the perception of the importance of teaching on our campus, and to the creation of more consistent and equitable practices of summative teaching assessment.

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Details of Mechanisms: Formative Peer Review of Teaching

CTAPT recommends the expanded use of existing models for formative PRT. Effective models of various kinds exist across campus. Two such examples are:

- Reciprocal pairs
    - Two faculty members do an informal peer review of each other
    - Done more informally using Faculty PRT Report Template, but without submitting a report or notes to the Unit Head or review committee
- Teaching triangles or squares
    - Three or four instructors collaborate on observation and discussion

CTAPT hopes that increased awareness of these models, as well as the mandatory use of regular summative PRT, will lead to expanded uptake of formative PRT, which will lead to more engagement with teaching across campus.

Other models also exist, both at Waterloo and elsewhere, and could also be used; both CTE and the Office of Teaching Assessment Processes could be used as resources as to how to best implement and adapt these to the Waterloo context. In every formative PRT model, there should be no expectation of a written report, but pre- and post-review meetings should happen and the involvement of all parties should be documented in respective APR/BPR reports, where it should be looked on positively as the "Professional Development" dimension of Teaching Effectiveness.

CTAPT encourages more frequent involvement in formative PRT for faculty members with higher teaching loads because of additional contact with students and thus additional impact on student learning.

Details of Mechanisms: Teaching Dossiers for APR/BPR

The most regular place at which Waterloo faculty members interact with Teaching Assessment Processes is at the time of Annual/Biannual Performance Review (APR/BPR). It is thus important for faculty members to be able to have agency over some parts of this process through a clear and consistent ability to submit information for review committees to consider. Based on existing APR/BPR materials, extensive team conversations, and consultations with the campus community, CTAPT recommends a format for incorporation into APR/BPR documentation and forms that includes the following components, not all of which will necessarily apply in a given year:

1) Charts to list teaching (undergraduate, graduate, other) and supervision (undergraduate, graduate, other), including enrollment and other necessary facts. (Note: Faculties may want to include additional discipline-appropriate supervision tasks.)

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2) Space for optional shorter comments on the context of this teaching/supervision, including challenges specific to particular courses/supervisions. (Note: Longer comments can be included in later sections.)

3) List of curriculum work, course renewal, and new course development.

4) List of work on Scholarship of Teaching and Learning.

5) List of professional development undertaken.

6) Most recent summative PRT.

7) Space for optional comment on PRT results possibly including actions taken in response. (Note: PRT might be several years old, but comments about ongoing work towards continuous improvement would be appropriate.)

8) Include SCPS results from relevant period of time. (Notes: CTAPT hopes that new SCPS system could eventually provide standard output for inclusion here. Review committees should also have direct access to SCPS results.)

9) Space for optional comment on SCPS results possibly including actions taken in response.

10) Space for reflective narrative (1 page) about teaching and PD with the following prompt:

Provide a one-page narrative that includes highlights from your teaching over the last [APR: one year/BPR: two years] regarding some or all of the following four dimensions of effective teaching in relation to course teaching and/or supervision:

- *Design changes and/or successes*
- *Implementation changes and/or successes*
- *Actions you've taken to foster a positive learning environment for your students*
- *The effect of teaching and learning professional development on your practice*

Where possible, refer to Waterloo's framework for Teaching Effectiveness and/or teaching goals from previous years, and provide a small number of specific examples and/or some specific evidence from you, your students, and/or your peers.

11) List of three goals / next steps as a teacher

Put together, CTAPT believes that responses to these questions provide sufficient opportunity for faculty members to show the scope of their teaching of all kinds, to provide commentary on their successes and challenges, and to look reflectively both backwards and forwards.

Additional Notes
- CTAPT anticipates that a typical submission using this format will be between 2 and 3 pages long, most of which will be in the form of charts and lists.
- We anticipate that a faculty member might take between 30 and 60 minutes for each term of teaching to complete this documentation. Many faculty members already

engage in this type of reflection on their teaching and may find that the amount of additional time beyond their usual reflection is minimal. While the time investment required for these mechanisms was a common concern raised at our consultation sessions, we believe that this investment is worthwhile, is not a "make work" project because of the benefits to our individual and collective educational efforts and is consistent with the recommendation "Continue to enhance the culture of teaching" included in CTAPT's 2020 report.

- We estimate that each review committee member will need to spend 5 to 10 minutes extra per faculty member to review this documentation. Review committees may wish to divide up these reports among committee members while ensuring that each review is read by at least two committee members.

- Review committee members will need to undertake training on how to read and assess these submissions. The creation of Faculty-specific rubrics could be useful.

- CTE already provides training to faculty members on how to write for Teaching Dossiers. This training will need to be adapted for these new processes and may need to be expanded for possible additional demand that the requirement for this documentation might generate.

- Guidebooks, templates, and samples will need to be created by an appropriate University body.

- The University may wish to investigate the use of online platforms for the long-term "curation" of relevant materials and for the submission of this section of APR/BPR forms.

Details of Mechanisms: Teaching Dossiers for T&P

The creation of a package to submit for Tenure and Promotion (T&P) requires significant time and energy. A common outline of what such a package could include to best represent one's teaching could be useful to faculty members (hopefully removing some stressful uncertainty about how to best do this) and to T&P committees (allowing them to focus on the content in a consistent way). CTAPT sees an ideal format for incorporation into T&P documentation that includes the following components:

1) Teaching Responsibilities (1/2 page to 1 page)
   - Summary paragraph
   - Typical courses taught and role, including coordination, indication of differences from "standard" teaching tasks or normal model for the department/unit (e.g. team teaching)
   - Table to summarize teaching responsibilities (counts of courses, supervisions, etc. (not lists of individual courses); similar to research output table in cyclical review)

2) Teaching Statement (1/2 page to 1 page)
   - Philosophy and/or principles of teaching

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- Could draw from previous APR/BPR reflections and weave an over-arching narrative

3) Strategies Used to Teach Effectively (1 page to 3 pages)
- Narrative (not bullet points)
- Connect to University Framework for Teaching Effectiveness
- Incorporate elements of Design, Implementation, Learning Experience
- Where relevant, refer to Professional Development done and how it influenced teaching approaches
- Where relevant, include commentary about innovative approaches tried and analysis of their success

4) (Optional) Scholarship and Leadership (1 page)
- Narrative about such work done in the past
- Scholarship of Teaching and Learning (e.g. participation and presentation in on- and off-campus conferences, publications, workshops presented, media presence)
- Leadership in teaching (e.g., leadership positions held, course creation, curriculum development, coordination, creation of resources)
- Service activities related to teaching (e.g., curriculum committees, University-level committees on assessment of teaching)

5) Evidence of Teaching Effectiveness (1/2 page to 1 page)
- Summary of and response to PRT
- Summary of and optional response to SCPS data
- Teaching awards received

6) Goals in Future Teaching (1/2 page to 1 page)
- Discussion of future goals (e.g., strategies to improve learning, innovative approaches, collaborations, contributions to program/unit, expanding range of content and courses taught)
- Strategy for achieving these goals which may include future professional development

7) Appendices (suggested to be no more than 10 pages in total)
- Representative samples, not exhaustive list
  - Include most recent Peer Review reports
  - Include up to 5 supporting documents that best exemplify earlier content in dossier; types of material could include excerpts from relevant teaching materials, evidence of student learning, publications, media presence, other relevant materials
- All materials to be included in package (no links)

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Put together, CTAPT believes that these sections provide opportunity for faculty members to demonstrate their contributions to the teaching and learning enterprise of the University over a period of several years.

Additional Notes

- CTAPT anticipates that a typical submission using this format will be between 4 and 8 pages long, plus supporting appendices.
- Reponses to these sections can and should be aligned with previous APR/BPR responses, thus allowing information to feed organically over time into this larger TD for T&P.
- Faculty should avoid including the same example in multiple categories.
- We anticipate that a faculty member might take between 10 and 12 hours in the creation of their teaching package for T&P. While intensive effort is required, CTAPT believes that this is not disproportional to the importance of the T&P and the reward of tenure and/or promotion.
- T&P committees may need to adapt current practices to allow for more consideration of teaching-related information from candidates.
- Guidebooks, templates and samples will need to be created.

Non-Faculty Instructors

While the four mechanisms above apply explicitly to regular faculty members at Waterloo, each of the mechanisms might have its uses for instructors who belong to other groups or by units wishing to provide formative feedback to or to make hiring decisions about such instructors. A non-exhaustive list of possibilities of such uses includes:

- *Summative PRT*
  - Could be used by units to mentor and/or assess instructors of all kinds.
  - Could be requested by graduate students to include in application packages for future positions.
- *Formative PRT*
  - Could be used by any and all instructors looking for ways to receive feedback on their own teaching.
  - Could be used by any and all instructors interested in observing other instructors and participating in pedagogical discussions.
- *Teaching Dossiers for APR/BPR*
  - Could be used by some staff instructors as part of their annual review process.
  - Could be used by units as part of an assessment of the work of sessional instructors.
- *Teaching Dossiers for T&P*
  - Could be used by graduate students preparing for careers in academia as a template to follow and adapt.

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Consultation Process

Throughout both phases of its work, CTAPT has consulted widely. These consultations have occurred informally and organically by having membership from across campus, and have also happened more formally and intentionally. In recent months, CTAPT has presented and received feedback at a meeting of Undergraduate Operations, at a meeting of the Teaching Fellows, and twice at meetings of Deans' Council. The tone of all of these meetings was positive and supportive, and good questions were asked.

In July 2021, when earlier versions of its materials were available, CTAPT conducted nine consultation sessions with faculty across campus. All faculty members were invited to six Faculty-specific sessions and one AFIW session, with roughly 120 attending. At each session, CTAPT representatives gave a 20-minute presentation summarizing our past work and current directions, and then moderated an open discussion among the attendees. Overall, CTAPT heard strong support from across campus for moving towards the widespread regular use of TD and PRT as part of APR/BPR summative assessment of teaching and in the tenure and promotion process. Support was not universal, but supporting voices did outnumber concerned voices. Some concerned voices did not support this direction in principle, while others wanted to see additional details about the process. Both among supporters and non-supporters, there were important concerns raised. CTAPT has combined these concerns into five categories:

1. *Mechanism*: How will peer review actually work? How will reviewers be chosen and tracked? What will timelines be? Will there be an appeals process?

2. *Time Commitment*: How will busy faculty members manage the additional time that these processes could entail? How will administrative overhead be absorbed? Will peer reviewers count their time as Teaching or as Service?

3. *Bias*: How will biases be minimized when implementing these new tools? How can issues around power dynamics be dealt with?

4. *Culture*: Can a positive culture be maintained when colleagues review other colleagues? Can summative peer review be done in a way that prioritizes teaching development? How do we find the best balance between collegial advice and formal reviews? How will we all prepare for changes to processes and scores? What University Policies will need amending to support this work?

5. *Training*: What training and supports will be available and necessary for faculty members, for peer reviewers, and for unit-level review committees? How do we ensure alignment between the University's framework for teaching effectiveness and how assessment is carried out, in order to ensure that instructors are assessed fairly and equitably?

CTAPT believes that our subsequent work has gone as far as we can in this phase of the University's work towards answering these questions and addressing these concerns. We

recognize that all of this work is, at the core, work towards *culture change* at the University, and culture change is almost always hard. We also fully support the need for these processes to evolve after they are implemented to suit the ever-evolving educational landscape in which we will find ourselves.

Steps Towards Implementation

This report and presentation to Senate, coupled with earlier presentations of its recommendations to bodies like Deans' Council and groups like the Teaching Fellows, brings the formal work of Phase 2 of CTAPT to a conclusion. Implementation of the set of CTAPT recommendations that are to go forward is the work of others. CTAPT would like to provide a list of questions which, we think, can guide the University towards successful implementation as they are resolved:

- What timeline is reasonable for implementing these processes? Who will oversee the implementation, both at a macro level and at a micro level?
- How will input from various mechanisms (both qualitative and quantitative) be used to determine APR/BPR scores?
- How should language from Policy 77 be updated to best encode these changes into University policy?
- How should training for peer reviewers and review committees best be created and administered?
- With additional mechanisms in place, is the timing for APR/BPR committees feasible? (This timing seems to be constrained by the release of Fall SCPS results and an allowance for time for commentary from instructors on one end, and by the need to submit scores to salary adjustment systems on the other end.)
- How should Faculties contribute to the ongoing oversight and evolution of these processes at the University level?

Conclusion

Spring 2022 sees University education in a place that balances many hopes and concerns. We are all hopeful that the worst of the COVID-19 global pandemic is behind us, while acknowledging that the educational world has changed irreversibly in so many ways. At the same time, we recognize myriad challenges that students have faced over the last 2.25 years and the resulting lost learning that has occurred. We also find ourselves at a point where the accountability of educational institutions could be more important than ever before.

For all of these reasons, CTAPT fully believes in the University of Waterloo's move towards more holistic assessment of teaching. While much of the work of CTAPT has been focussed, by necessity, on looking at the summative aspects of teaching assessment at Waterloo, we reminded ourselves constantly as a team that our goal always was to provide opportunities and mechanisms for all of us to improve our teaching. With more equitable and robust processes in place, we will be well-poised as educators to lead the important (and often difficult) changes

that are required to further enhance the culture of teaching and learning on our campus, and to provide all of us with the opportunity to be more effective teachers through better understanding of what this actually means and through more modern and evidence-based approaches that ensure that we are on the right track.

An Institutional Framework for Teaching Effectiveness

Remit

As part of the University of Waterloo's initiative to develop a fairer, more equitable, and transparent system for the evaluation of teaching, the Office of Teaching Assessment Processes [4] is developing a holistic "framework" of teaching effectiveness informed by:

- institutional priorities,
- the research literature, and
- consultations with campus stakeholders.

Why do we need a framework of teaching effectiveness?

- "Good teaching" can mean many different things. By gaining institutional endorsement for a characterization (framework) of good teaching that reflects agreed upon values for the local context, we can incentivize the kinds of teaching we want to see.
- Buy-in for assessment practices is more likely when campus stakeholders can see how those practices provide real evidence about how well important aspects of good teaching are being carried out, and this can be made clear if we have an institutionally endorsed framework.
- Measures of "teaching effectiveness" should be grounded in a concrete framework that is built on answers to these questions:
  - What matters for instructors at Waterloo with respect to teaching?
  - What matters for students at Waterloo with respect to teaching?
  - What does the literature say matters with respect to effective teaching?
  - What does Waterloo need to strive for to be the leading institution for teaching effectiveness in Canada?

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[4] There are currently three projects underway with respect to teaching assessment.
  - Waterloo Student Course Perceptions Project (formerly the Course Evaluation Project)
  - Complementary Teaching Assessment Processes Project (CTAPT)
  - Graduate Supervision Task Force Project

The goal is to synthesize the work of these three projects into more systematically holistic assessments of teaching. The proposed framework is a step towards preparing for holistic assessments while the projects complete their work.

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Timeline in Brief

Start	Team	Accomplishments
2014	Course Evaluation Project Team (CEPT) 1	• Developed Dimensions of Teaching Effectiveness framework linked to student course perception (SCP) surveys Grounded in literature and UW context (e.g., strategic plans)

2018	Course Evaluation Project Team (CEPT) 2	• Refined and reinforced framework:
		    ○ pilot test
		    ○ factor analysis
		    focus groups with students (in all six Faculties)

2019	Complementary Teaching Assessment Project Team (CTAPT)	• Examined literature • Conducted extensive consultations with stakeholders, especially instructors, on campus Findings consistent with work of CEPT1
2020	Graduate Supervision Task Force	• Examined literature • Completed research study Findings consistent with the work of CEPT and CTAPT

2021	Consolidation and centralization	• Consolidation of findings of the three projects into draft framework of Teaching Effectiveness at the University of Waterloo
		• Consultations to date indicate strong support
		    ○ UOps
		    ○ FAUW Equity Committee
		Gradops - forthcoming

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A Framework for Teaching Effectiveness at Waterloo

	Design	Implementation	Learning Experience	Professional Development
Overview	• Planning • Creating	• Design to action	• Learning environment	• Activities supporting growth as an instructor/supervisor
Areas of focus	• Framework • Alignment • Assessments	• Communication • Promotion of student engagement • Variety of teaching strategies and practices • Assessments/feedback	• Rapport • Responsiveness • Engagement with learning • Diversity • Inclusion	• Reflection • Continuous improvement • Collaboration, mentorship, and leadership
Examples of possible indicators	• Learning objectives/outcomes • Learning materials • Learning activities • Teaching philosophy	• One-on-one/small group/large group interactions • Synchronous/ asynchronous instructional activities	• Interactions in class, online, or outside of class (e.g., supervision) with instructor, course personnel (e.g., TAs), or supervisor • Patterns of participation from students	• Refinement of instructional materials and approaches • Workshops and conferences (participation and/or leadership) • Scholarship of Teaching and Learning (SoTL) • Mentorship with colleagues and/or students

"Effective teaching at the University of Waterloo promotes challenging student outcomes through learning environments designed and implemented according to established best practices and principles."

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Teaching Effectiveness Framework: Defining the Categories

Design

Planning
- Builds course around one or more overarching themes, stories and/or questions
- Clearly defines attainable course-level and activity-level learning objectives/outcomes
- Includes learning material that reflects current scholarship from the field or that is clearly relevant
- Structures material in a logical and coherent order
- Sets pacing, workload and performance standards appropriate for the course level and topic
- Includes experiential components, professional connections, or practical applications, when possible.
- Plans a variety of teaching/learning strategies to promote student engagement and deep approaches to learning
- Incorporates a diversity of experiences, viewpoints, and backgrounds in course materials
- Adheres learning materials, activities, and assessments to University accessibility policies

Framework
- Aligns course design with program expectations
- Aligns course objectives and learning outcomes with course content and delivery
- Develops fair and equitable assessment methods that align with course objectives and outcomes

Implementation

Communication
- Communicates course-level and activity-level objectives/outcomes as well as teaching/learning approach and rationale to students
- Describes and explains material clearly using a pace appropriate to the context
- Demonstrates enthusiasm for the subject
- Uses technology, media or other teaching tools effectively

Student engagement
- Promotes student participation, peer interactions, or other active engagement with course content
- Uses teaching/learning strategies that encourage student engagement and deep approaches to learning

Variety of elements
- Adapts to evolving classroom contexts
- Adopts a variety of instructional practices, content types, and assessments that recognize diversity of learners

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Assessments and feedback
- Enables students to prepare for assessments through instructional practices
- Communicates clear expectations and instructions for assessments
- Provides performance feedback in a timely manner
- Provides directions for student improvement individually or collectively

Learning experience

Rapport
- Fosters a supportive learning environment
- Establishes a climate of intellectual openness
- Shows concern for students' success and wellbeing
- Interacts professionally and respectfully with students

Responsiveness
- Provides sufficient opportunities for student contact inside and outside of class
- Responds to student inquiries and questions in an appropriate timeframe

Diversity
- Promotes inclusion and diversity by acknowledging variety of experiences, viewpoints, and backgrounds

Engagement and learning
- Generates and maintains student interest
- Fosters students' intrinsic motivation and responsibility for their own learning
- Seeks student input on course learning experience
- Provides evidence of student learning

Professional development

Reflection
- Reflects on and assesses teaching and learning practices
- Engages in a scholarly approach to teaching through determining and implementing best practices

*Growth and continuous improvement*
- Participates in professional development activities
- Makes thoughtful and deliberate changes to practices or develops innovations in response to new information about best practices or to other opportunities as they arise
- Regularly revises or updates course content, assignments, format, or teaching strategies in response to feedback and reflection

Collaboration, mentorship, and leadership
- Demonstrates leadership related to teaching and learning within the University and in the broader educational community

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- Interacts and works with colleagues around teaching and learning
- Provides and receives mentorship related to teaching, including with teaching assistants
- Contributes to the Scholarship of Teaching and Learning

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Teaching Effectiveness Framework and Student Course Perception Surveys (SCPs)[5]
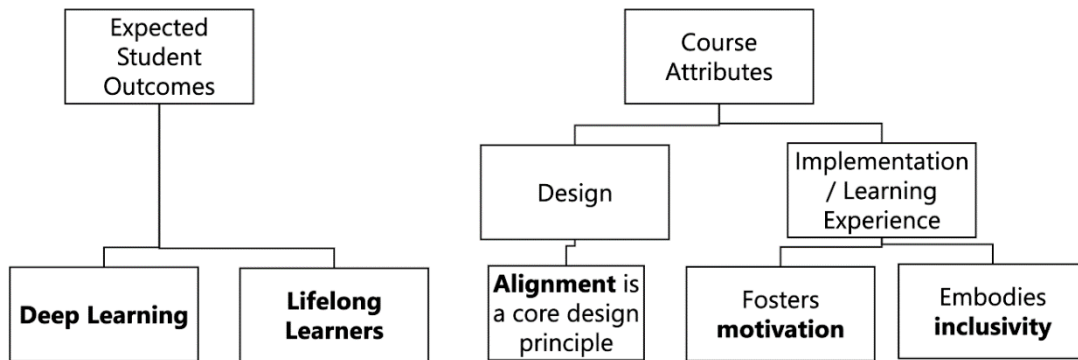
Course Attributes (measured with the SCP)

1. **Alignment** in design occurs when outcomes that are focused on learning are made explicit for learners in courses and programs, the assessments of learning match the outcomes, and the incorporated activities prepare learners for the assessments (Biggs & Tang, 2007).
2. **Motivation** occurs when learning experiences, inside and outside the classroom, are relevant and of value to learners, provide them with choice, and feel achievable yet appropriately challenging (Svinicki, 2004).
3. **Inclusivity** occurs when learning environments and experiences engage learners with differences respectfully and are designed to enable all to learn (Ouellett, 2005).

Expected Student Outcomes (not measured with the SCP)

4. **Deep learning** occurs from experiences that encourage learners to make connections, apply knowledge in new contexts, engage in learning activities and analytical thinking on their own and with others, and retain their learning (Christensen Hughes & Mighty, 2010).
5. **Lifelong learning** occurs from experiences that teach students to think about their thinking, become self-aware as learners, take responsibility for their learning, and self-assess their learning (Yancy McGuire, 2015).

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[5] Note: this framework is used to guide Faculty consultations to develop tier-two survey items for the SCP survey.

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Vice-President, Research & International
Report to Senate
June 2022

Introduction
This report to Senate highlights successful research outputs and outcomes for the period April -May, 2022 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

Awards and Distinctions

Andrea Edginton (School of Pharmacy) - 2022 Faculty of Science - Excellence in Science Research
- Professor Andrea Edginton, the Hallman Director of the School of Pharmacy, has been selected for one of this year's tenure-level awards. She is a globally recognized leader in pharmacokinetic (PK) modeling, an area of study that explores how the human body processes medications.

Anna Klinkova (Chemistry) - 2022 Faculty of Science - Excellence in Science Research
- Professor Anna Klinkova from the Department of Chemistry has been selected for this year's tenure-track award. She focuses her research on developing catalytic materials and chemical reactions for sustainability applications, including electrochemical conversion of carbon dioxide to useful chemicals, treatment and upgrading of nitrogenous waste, and electrosynthesis of renewable fuels.

Rebecca Rooney (Biology) - 2022 Faculty of Science - Excellence in Science Research
- Professor Rebecca Rooney from the Department of Biology has also been selected for this year's tenure-track award. She studies the effects of human disturbance and invasive species on wetlands.

Matthias Schonlau (Statistics and Actuarial Sciences) - Humboldt Prize - Alexander von Humboldt Foundation
- Honours exceptional alumni for their outstanding accomplishments in pharmacy practice and pharmaceutical sciences.

Faculty of Environment Award: The Faculty of Environment introduced four annual awards in recognition of faculty and staff for their exceptional contributions and dedication to their field (teaching, research, service) which has led to the enrichment of the Faculty. Recipients of the award include:

- **Daniel Scott** (Geography and Environmental Management) **-** Research
- **Paul McKone** (Knowledge Integration) - Teaching

- **Janice Barry** (School of Planning) - Service

Tri-Council Funding

CIHR Operating Grant: Addressing the Wider Health Impacts of COVID-19

- **Justine Giosa** (School of Public Health Sciences), Co-designing action-oriented mental health conversations between care providers and aging Canadians in the community: mitigating the wider impacts of COVID-19, $499,948

SSHRC Partnership Development Grants

1. **Philip Beesley** (Architecture), Empathetic Spaces Partnership, $114,176
2. **Dawn Parker** (Planning), Why did the 'Missing Middle' miss the train? Exploring barriers and solutions to intensified family housing in Waterloo Region, $189,926
3. **Bessma Momani** (Political Science), Digital Transformation of Work: Determining Impacts on Women and Skills Retraining Needs, $199,999

Institutional Research Funding

Canada Research Chairs

- **Jun Liu** (Applied Mathematics), Renewal Tier 2 NSERC, Chair in Hybrid Systems and Control, $100,000 over 5 years.

Canada Foundation for Innovation John R. Evans Leaders Fund (CFI-JELF)

For the **June 2021** CFI-JELF competition, Waterloo was successful in securing eight of the nine (or 89% success rate) submissions, totalling **$1,109,850** in funding.

1. **Chris Bachmann** (Civil and Environmental Engineering), Virtual Mobility Lab (VML) for Innovative Transportation Research, $174,850
2. **Dayan Ban** (Electrical and Computer Engineering), An advanced evaporator for dedicated high-quality and high-precision indium deposition, $145,000
3. **Slim Boumaiza** (Electrical and Computer Engineering), Realistic Over-the-air Test System for Researching Wireless and Satellite Communications at up to 44 GHz, $270,000
4. **Joyce Kim** (Civil and Environmental Engineering), An integrated digital platform for occupant-centric building operation, $160,000
5. **Ewen MacDonald** (Systems Design Engineering), Measurement Systems for Investigating Speech Communication, $80,000
6. **Jozef Nissimov** (Biology), Experimental modelling of aquatic microbial hosts and their viruses, $100,000

7. **Serhiy Yarusevych** (Mechanical and Mechatronics Engineering), Infrastructure for the analysis of multi-phase flows for airborne disease mitigation and pollution control, $180,000

8. **Shunde Yin** (Civil and Environmental Engineering), Laboratory investigation of geosynthetics reinforced pavement system in response to low temperature and climate change, $90,000

For the **October 2021** CFI JELF submission cycle, Waterloo was successful in securing 15 of 16 submissions (or 94% success rate), for a total funding of **$2,728,885**.

1. **Raouf Boutaba** (Cheriton School of Computer Science), Timely and privacy-preserving threat intelligence using machine learning, $85,000

2. **Monica Emelko** (Civil and Environmental Engineering), Infrastructure to Identify and Mitigate Threats to Drinking Water Source Quality and Treatability in a Changing Climate, $250,000

3. **Parsin Haji Reza** (Systems Design Engineering), Developing Photoacoustic Remote Sensing (PARS) for Next Generation Real-Time Medical Imaging in-Situ, $209,440

4. **Holger Kleinke** (Chemistry), Multi-User High-Resolution X-ray Powder Diffractometer with Heating Stage, $103,668

5. **Daniel Lacroix** (Civil and Environmental Engineering), Infrastructure for the experimental evaluation of innovative mass timber and FRP-hybrid systems, $104,000

6. **Anita Layton** (Applied Mathematics), A data-informed model for predicting kidney outcomes, $118,221

7. **Logan MacDonald** (Fine Arts), Longhouse Labs, $577,855

8. **Monica Maly** (Kinesiology and Health Sciences), Human Motion Analyses to Predict and Treat Osteoarthritis, $79,776

9. **Yash Vardhan Pant** (Electrical and Computer Engineering), Advancing Safety of Autonomous Systems for real-world applications, $80,000

10. **Hamed Shahsavan** (Chemical Engineering), Infrastructure for the characterization and manipulation of soft robotic materials, $90,000

11. **Rodney Smith** (Chemistry), Laboratory X-ray Absorption Spectroscopy to Accelerate Sustainable Technology Development, $560,000

12. **Marek Stastna** (Applied Mathematics), CPU-GPU enabled computational modelling of the coastal ocean, $83,425

13. **James Tung** (Mechanical and Mechatronics Engineering), Real-world Assessment of Assistive Robotics for Mobility Impairments and Injury Prevention, $227,500

14. **Boxin Zhao** (Chemical Engineering), Infrared Imaging and Drop Shape Analyzer Systems for Surface Science and Bionanomaterials Development, $80,000

15. **Jian Zhao** (Cheriton School of Computer Science), Human-Machine Collaborative Visual Data Exploration and Analytics, $80,000

Ontario Research Fund-Small Infrastructure Fund (ORF-SIF) (Oct 2020)

The ORF-SIF program co-funds with John R. Evans Leaders Fund through the Canada Foundation for Innovation. In the October 2020 ORF-SIF competition, Waterloo secured three awards, totalling **$362,000**.

1. **Kelsey Leonard** (School of Environment, Resources and Sustainability), Chair Indigenous Waters, Climate and Sustainability, $125,000

2. **Jason Au** (Kinesiology and Health Sciences), Infrastructure for advanced hemodynamics research, $100,000

3. **Chul Min Yeum** (Civil and Environmental Engineering), Infrastructure for Advancing Vision-Based Structural Assessment Technologies, $137,000

Early Researcher Awards (ERA) - Round 16

The ERA provides funding to exemplary new researchers working at publicly funded Ontario research institutions to build a research team. For Round 16, Waterloo was successful in winning eight awards out of 29 submissions, representing a success rate of 28%. The provincial success rate was 16%. The Award is valued at **$190,000** ($100,000 direct + $40,000 indirect; $50,000 UW matching).

1. **Martine August** (School of Planning), Investing in Rents: The Impacts of Apartment Financialization in Canada

2. **Chris Bachmann** (Civil and Environmental Engineering), Modeling Crude Oil Shipments for Risk Assessment and Economic/Environmental Analysis

3. **Anna Klinkova** (Chemistry), Designing electrocatalysts to convert waste small molecules into value-added products

4. **Shane McIntosh** (Cheriton School of Computer Science), Self-Sustaining Software Build Systems

5. **Walaa Moursi** (Combinatorics and Optimization), Splitting algorithms for pathological optimization problems: Static results and dynamic behaviour

6. **Christine Muschik** (Physics and Astronomy), Quantum Simulations of Fundamental Particle Interactions

7. **Crystal Senko** (Physics and Astronomy), Partial readout of quantum information using trapped ions

8. **Sophie Spirkl**, (Combinatorics and Optimization), Structure and algorithms in graph theory

R3 - Leveraging partnerships for research impact

Waterloo International Agreements

Waterloo International facilitated the signing of one agreement as follows:

- University College London (UCL), United Kingdom, Traditional Student Mobility (Exchange) Agreement.
  - This was a renewal of an agreement first signed in 2013 between UCL and Waterloo. It applies university-wide at Waterloo and in the Faculty of Arts and Humanities, Faculty of Social and Historical Sciences, Faculty of Mathematical and Physical Sciences, Faculty of Engineering, Faculty of Life Sciences and Faculty of Brain Sciences at UCL.

University of Waterloo and University of Strathclyde Transatlantic Funding Call Participants and Projects

Waterloo International stewards the *Strathclyde/Waterloo Joint Transatlantic Funding Call* with colleagues at Strathclyde. Five funded teams were selected from 35 completed applications, submitted by both researchers and professional services staff, bringing together over 100 colleagues in the process. All funded projects connect with the Universities' strategic objectives. Ten awards of up to CAD $20,000/£12,000 have been awarded in pairs, with Strathclyde and Waterloo each providing their side of the joint collaborative teams an award.

1. **John Zelek** (Systems Design Engineering), Explainable AI for Nuclear Core Component Inspection

2. **Eric Croiset** (Chemical Engineering), The Role of Hydrogen in Decarbonising the Steel Industry: Upstream and Downstream Opportunities in Scotland and Ontario

3. **Sarah Turnbull** (Sociology and Legal Studies), COVID-19 Justice as Penal Justice: Examining the Impacts of the Pandemic on Prisons in Canada and Scotland

4. **Juewen Liu** (Chemistry), New Aptamer and Surface-enhanced Raman Scattering Based Biosensors for Detecting Antibiotics in Water

5. **Plinio Morita**, (School of Public Health Sciences and cross appointment with Systems Design Engineering), Applications of AI in the Development of Public Health Solutions

For more information please see: https://uwaterloo.ca/international/news/university-waterloo-and-university-strathclyde-transatlantic

Scholars At Risk (SAR) Network

On 19 April 2022, the University of Waterloo announced that it is joining the Scholars at Risk (SAR) Network, effective immediately. SAR's mission is to protect threatened scholars, prevent attacks on higher education, and promote academic freedom and related values. SAR arranges temporary research and teaching positions at institutions in its network and provides advisory and referral services for scholars forced to leave their communities for reasons including war, intimidation, and threats of violence. By joining, Waterloo will engage in–and contribute to–SAR's two sets of activities:

- **Protection**: By arranging temporary academic positions at member universities and colleges, SAR offers safety to scholars facing grave threats, so scholars' ideas are not lost and so that they can keep working until conditions improve and they are able to return to their home countries.

- **Advocacy and Learning**: SAR also provides advisory services for scholars and hosts, campaigns for scholars who are imprisoned or silenced in their home countries, monitoring of attacks on higher education communities worldwide, and leadership in deploying new tools and strategies for promoting academic freedom and improving respect for university values everywhere. Waterloo members will be able to join global peers on a variety of initiatives, and network with like-minded colleagues in working groups, workshops, and conferences.

For more information on this announcement please visit https://uwaterloo.ca/international/news/waterloo-joins-scholars-risk-network.

Associate of Commonwealth Universities (ACU)

Waterloo International published an article about the University of Waterloo's participation in the Associate of Commonwealth Universities (ACU). The ACU aims to build a better world through higher education and proposes that bringing universities together from around the world will help to advance knowledge, promote understanding, broaden minds, and improve lives. To view the article, visit: https://uwaterloo.ca/international/news/university-waterloos-membership-association-commonwealth

Internationalization and Sustainability

On Earth Day 2022, Waterloo International shared reflections on Internationalization and Sustainability in higher education generally and more specifically, at the University of Waterloo, over the past year. To read the full article: https://uwaterloo.ca/international/news/earth-day-2022-reflections-internationalization-and