

University of Waterloo
SENATE
Notice of Meeting

Date: Monday 21 October 2019

Time: 3:30 p.m.

Place: Needles Hall, room 3407

	OPEN SESSION	Action
3:30	<u>Consent Agenda</u> Motion: To approve or receive for information by consent items 1-5 below. <ol style="list-style-type: none"> 1. Minutes of the 16 September 2019 Meeting 2. Reports from Committees and Councils <ol style="list-style-type: none"> a. Graduate & Research Council b. Undergraduate Council 3. Report of the President <ol style="list-style-type: none"> a. Recognition and Commendation 4. Reports from the Faculties and St. Jerome's University 5. Committee Appointment 	Decision Information Decision/Information Information Information Decision
3:35	<u>Regular Agenda</u> 6. Business Arising from the Minutes	
3:40	7. Teaching Presentation – Paul Wehr, Department of Psychology	Information
3:50	8. Reports from Committees and Councils	First Reading
3:55	<ol style="list-style-type: none"> a. Executive Committee b. Joint Report – Graduate & Research and Undergraduate Council 	Decision
4:00	<ol style="list-style-type: none"> c. Graduate & Research Council d. Undergraduate Council 	Decision
4:10	<ol style="list-style-type: none"> e. Long Range Planning i. Strategic Plan Recommendation 	Decision
4:20		Recommendation
4:30	9. Report of the President	
4:40	<ol style="list-style-type: none"> a. Strategic Plan Final Decision b. Update 	Decision Information
4:50	10. Q&A Period with the President	Information
5:00	11. Report of the Vice-President, Academic & Provost	
5:10	<ol style="list-style-type: none"> a. Student Experience Review b. Strategic Mandate Agreement Update 	Information Information
5:15	<ol style="list-style-type: none"> c. Degrees, Diplomas, and Certificates* [list of graduands to be available for review online prior to the Senate meeting] 	Decision
5:20	12. Report of the Vice-President, Research and International	Information
5:25	13. Other Business	
	CONFIDENTIAL SESSION	
5:30	14. Minutes of the 16 September 2019 Meeting	Decision

	CONFIDENTIAL SESSION	Action
5:35	15. Business Arising from the Minutes	
5:40	16. Report of the President	Information
5:45	17. Other Business	

7 October 2019
KJJ/ees

Karen Jack
University Secretary
Secretary to Senate

University of Waterloo
SENATE
Minutes of the 16 September 2019 Meeting

Present: Sheila Ager, Jean Andrey, Upkar Arora**, Michael Balogh, Sandra Banks, Chris Bauch, Michael Beauchemin, Ashreena Bhangu, Carmen Bruni, Jeff Casello, Joan Coutu, Eric Croiset, Alexandria De Sousa, Shannon Dea, Peter Deadman, Charmaine Dean, David DeVidi, Lynette Eulette, Paul Fieguth, Wendy Fletcher, George Freeman, Mark Giesbrecht, Robert Gorbet, Feridun Hamdullahpur (chair), John Haddock, Craig Hardiman, Dennis Huber, Karen Jack (secretary), Natalie Hutchings, Martin Karsten, Sabrina Khandakar, Veronica Kitchen**, Scott Kline, Alex Lee, Robert Lemieux, Lili Liu, Kesen Ma, Ellen MacEachen, Katie Misener, Zoran Miskovic, Barb Moffatt, Rick Myers, Cathy Newell Kelly, Erin O'Connell, Troy Osborne, William Power, William Pristanski, James Rush, Max Salman, Naima Samuel, Mark Seasons, Marcus Shantz, Joanne Shoveller, Siva Sivoththaman, Jason Small, Richard Staines, Pearl Sullivan, Susan Tighe, Hamid Tizhoosh, Bryan Tolson, Bruno Tremblay, Vivek Unnithan, Maya Venters, Johanna Wandel, Stephen Watt, En-Hui Yang

Guests: Bruce Campbell, Lindsay Campbell, Aldo Caputo, Mario Coniglio, Donna Ellis, Matthew Grant, Ross Johnston, Andrea Kelman, Jennifer Kieffer, Nick Manning, Norah McRae, Diana Parry, Chris Read, Ian Rowlands, Daniela Seskar-Hencic, Allan Starr, Emily Schroeder, Mat Thijssen, Marilyn Thompson, Rebecca Wickens

Absent: Dominic Barton*, Lisa Bauer-Leahy, Kankar Bhattacharya*, Anne Bordeleau*, Kofi Campbell*, Claudio Canizares*, Fred Chereshski, David Clausi*, Tara Collington*, Mathieu Doucet*, Fraser Easton*, Cindy Forbes*, Shikha Gandhi, Julia Goyal, Kelly Grindrod*, David Ha*, Teferi Mergo, Ian Milligan*, Linda Ogechi Iheme, Neil Randall*, Beth Sandore Namachchivaya*, Nancy Worth*, June Xu

*regrets

**joined by telephone

OPEN SESSION

The chair welcomed members to the first Senate meeting of the academic year, and acknowledged new members and those returning in different roles: Lili Liu, dean of applied health sciences; Sheila Ager, dean of arts; David DeVidi, associate vice-president, academic; Scott Kline, interim president, St. Jerome's University. He advised that the regular teaching presentation has been moved to the October meeting in order to provide time at today's meeting for discussion of the draft strategic plan.

Consent Agenda

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

Dea and Power.

1. MINUTES OF THE 17 JUNE 2019 MEETING

Senate approved the minutes of the meeting.

2. REPORTS FROM COMMITTEES AND COUNCILS

Graduate & Research Council. Senate received the report for information.

Undergraduate Council

Faculty of Science, Honours Chemical Physics

Senate heard a motion to approve the inactivation of the Honours Chemical Physics Regular and Co-op plans, effective 1 September 2020.

Faculty of Arts, Breadth Requirements

Senate heard a motion to approve the proposed addition to the Bachelor of Arts breadth requirements as outlined, effective 1 September 2020.

The remaining items in the report were received for information.

3. REPORT OF THE PRESIDENT

Recognition and Commendation. Senate received the report for information.

Tenure and Promotion. Senate received the report for information.

4. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST

Call for Nominations for University Professor. Senate received the report for information.

5. REPORTS FROM THE FACULTIES

Senate received the reports for information.

6. COMMITTEE APPOINTMENTS

Senate approved the following appointment:

Undergraduate Council: Alysia Kolentsis as faculty representative from a federated university college (St. Jerome's), replacing Veronica Austen, 1 September 2019 to 31 December 2019.

The question was called, and the motion carried unanimously.

Regular Agenda

7. BUSINESS ARISING FROM THE MINUTES

There was no business arising.

8. REPORTS FROM COMMITTEES AND COUNCILS

Graduate & Research Council

Faculty of Applied Health Sciences

Senate heard a motion to approve the creation of six fields in the PhD program in the School of Public Health and Health Systems, effective 1 January 2020, as presented at Attachment 1.

Casello and Liu. Carried unanimously.

Faculty of Engineering

Senate heard a motion to approve the addition of three specializations to the Master of Engineering (MEng) within the department of Electrical and Computer Engineering (ECE) effective 1 January 2020, as presented at Attachment 2. These specializations include: (a) biomedical engineering, (b) nanoelectronic devices and materials, and (c) software.

Casello and Sullivan.

In response to a question re: potential likenesses between the proposed software specialization and the programs offered by the Faculty of Mathematics, Casello advised that such considerations appropriately are considered by the Graduate & Research Council.

The question was called and the motion carried unanimously.

Undergraduate Council

DeVidi explained the delay on several of the items, and Senate heard the following motions:

To approve the motions involving inactivations as an omnibus motion:

Faculty of Arts, Culture and Language Studies

Senate heard a motion to approve the proposed inactivation of the existing certificates and creation of new diplomas in Arabic Language I and II, Chinese Language I and II, Korean Language I and II, and Japanese Language I and II as described, effective 1 September 2020.

Faculty of Arts, Social Development Studies

Senate heard a motion to approve the proposed inactivation of the Cultural Diversity Specialization and creation of the Diversity and Equity Specialization as described, effective 1 September 2020.

Faculty of Mathematics, Applied Mathematics

Senate heard a motion to approve the inactivation of the plans listed in the first column and the creation of the plans listed in the third column of the table, effective 1 September 2019.

Faculty of Mathematics, Computer Science

Senate heard a motion to approve the inactivation of the plans listed in the first column and the creation of the plans listed in the third column of the table, effective 1 September 2019.

Faculty of Mathematics, Mathematical Studies

Senate heard a motion to approve the proposed inactivation of the Mathematical Studies – Business Specialization plan and creation of the Business Specialization described, effective 1 September 2019.

DeVidi and Andrey. Carried unanimously.

To approve the motions involving new specializations as an omnibus motion:

Faculty of Engineering, Electrical & Computer Engineering

Senate heard a motion to approve the proposed specialization in Communication and Signal Processing as described, effective 1 September 2019.

Faculty of Environment

Senate heard a motion to approve the proposed diploma in Sustainability as described, effective 1 September 2019.

Faculty of Mathematics, Applied Mathematics

Senate heard a motion to approve the proposed Engineering Specialization: Heat and Mass Transfer as described, effective 1 September 2019.

DeVidi and Ager. Carried unanimously.

To approve the motions involving changes to academic plans as an omnibus motion:

Faculty of Arts, Studies in Islam Minor

Senate heard a motion to approve the proposed changes to the Studies in Islam Minor as described, effective 1 September 2020.

Faculty of Mathematics, Applied Mathematics

Senate heard a motion to approve the proposed changes to the Scientific Computation/Applied Mathematics plan as described, effective 1 September 2019.

DeVidi and Watt. Carried unanimously.

Academic Regulation Changes

Senate heard a motion to approve the harmonization and centralization of the regulations in the undergraduate calendar regarding the number of terms a student may be absent (not enrolled in courses) before that student will be required to submit an Application for Readmission.

Newell Kelly and Salman. Carried unanimously.

9. REPORT OF THE PRESIDENT

Updates. Hamdullahpur spoke to a variety of matters, including: new senior administrative appointments; an admissions update; new faculty hires; recent achievements and awards received by Waterloo faculty; government relations activities; Dominic Barton's recent appointment as Canada's ambassador to China; an SLC/PAC construction update; tomorrow's grand opening of the Field House.

Draft Strategic Plan 2020-2025. The President spoke to the culmination of activities in finalizing the plan and noted the coming approval path for it to proceed to Senate Long Range Planning, Senate and the Board in October. Speaking to his slides, Hamdullahpur noted: the involvement of the planning committee, Senate, and the Board already in the development of the draft plan; principles; considerations for senators' input; core elements; themes for action; signature commitments.

In discussion: an observation that commentary re: "curiosity-based research" seems not to be included in the commitments; whether the University is positioned to deliver on the commitments which will require change at Waterloo, and in response, commentary re: implementation plans which will follow; suggestions to embed "impact," and activities relating to climate action and change in all themes, and a suggestion to use the word "crisis" with respect to climate matters; a suggestion that a sixth bullet be considered for the "advancing research for global impact" areas of focus which would speak to the interdisciplinary research that occurs at Waterloo outside of the technical and science fields, and from Dean, how all Faculties are represented at a high level in this plan and in a more detailed way in the companion research strategic plan; how the values will be recognized and realized, and a suggestion that the University explore diversity in a meaningful way; a suggestion to ensure that the themes are properly connected to how and why Waterloo is unique in these areas; expressions of thanks for the University's engagement with the entire community in developing the plan; appreciation for the active language in the plan; further support for the addition of clearer statements regarding the University's strengths in human and social sciences research; a statement that the University ought to champion the position that "for humanity" is the answer to "why"; in recognizing the value of community, it will be important to ensure that all campuses are included in this vision and feel part of the Waterloo community; a suggestion to further embrace the "Warrior" name and identity for all members of Waterloo; a description of the vision re: lifelong learning; a suggestion that further clarity be added early in the document re: context and what's driving the plan; how donors have been engaged and their excitement for the plan; more re: the coming implementation strategy; a request that additional language be added re: the focus on mental health awareness and initiatives. Members were asked to send any further feedback by the morning of 28 September.

10. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST

Course Evaluation Project. DeVidi provided members with an update on the second phase of this project, including: the timeline of the project to today; continuing and recent work; a preview of highlights from the pilot test; variables that influence scores; findings re: gender.

In discussion: data sources which might be helpful in informing the committee's work; concerns re: the use of these assessments in a summative manner; the deep dive done by the committee with respect to literature about this subject; recognition that the assessments are only one part of a faculty member's performance evaluation; that students are best placed to contribute to assessments of the teaching and learning environment; biases and considerations for how to manage them; the challenges of obtaining data with respect to some potential areas of bias; the need for faculty to raise any concerns re: matters like the timing of their classes, etc. in documents they submit for their performance evaluations; response rates, and advice that they did not meaningfully decline when the University moved to online evaluations; the need to consider any potential biases.

Members heard that the presentation re: the Student Experience Review is deferred until the October meeting.

11. REPORT OF THE VICE-PRESIDENT, UNIVERSITY RESEARCH

Following a review by Dean of some notable aspects of the report, Senate received it for information.

12. OTHER BUSINESS

There was no other business.

Senate convened in confidential session.

25 September 2019

Karen Jack
University Secretary

CONFIDENTIAL SESSION

It was understood that senators are to keep confidential any discussion and decisions reached in this section of the meeting.

13. MINUTES OF THE 17 JUNE 2019 MEETING

Senate heard a motion to approve the minutes as distributed.

Samuel and Power. Carried unanimously.

14. BUSINESS ARISING FROM THE MINUTES

There was no business arising.

15. REPORT OF THE PRESIDENT

There was no report.

16. OTHER BUSINESS

There was no other business.

The meeting was adjourned at 5:56 p.m.

25 September 2019

Karen Jack
University Secretary

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
Report to Senate
21 October 2019

Senate Graduate & Research Council met on 9 September 2019 and agreed to forward the following items to Senate for approval or 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

CURRICULAR SUBMISSIONS

On behalf of Senate, council approved 2 new courses for the Faculty of Environment (knowledge integration).

OFFICE OF RESEARCH ETHICS

On behalf of Senate, council approved the following:

- Clinical Research Ethics Committee: 1 new member
- Human Research Ethics Committee: 2 new members

GRADUATE AWARDS

On behalf of Senate, council approved the Barry Bell Scholarship for Advanced Architectural Studies (endowment), Devon Stoneman Memorial Award (trust), Brian M. Jessop Graduate Scholarship in Fisheries Science (endowment), Cathleen Morawetz Graduate Entrance Scholarship (operating), and Robert Ewen Philosophy Awards Fund (endowment).

ACADEMIC PROGRAM REVIEW REPORTS

On behalf of Senate, council approved:

- Two-Year Progress Report – Masters of Mathematics for Teachers, as presented at Attachment 1
- Two-Year Progress Report – Intercultural German Studies, as presented at Attachment 2
- Final Assessment Report – Nanotechnology Collaborative Program (MSc, MAsC, PhD), as presented at Attachment 3

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

Charmaine Dean
Vice President, Research & International



MEMORANDUM

September 5, 2018

The Faculty of Mathematics is happy to endorse the two year progress report for the Masters of Mathematics for Teachers (MMT) September 2018.

Three of the six recommendations are now completed. The recommendation for dividing the Director of MMT and Director of CEMC position will be done in 2019/2020, and the delays upon acting on this recommendations are reasonable given the circumstances.

The recommendation to develop a curriculum map for co/pre requisites is expected to be done this Fall.

The last recommendation, to expand online part-time programs is something that the Faculty is taking into consideration, but is beyond the scope of the MMT program.

Regards,

A handwritten signature in black ink, appearing to be "SMW".

Stephen M. Watt
Dean, Faculty of Mathematics



Two-Year Progress Report

Master of Mathematics for Teachers (MMT)

September 2018

Background

The MMT is a part-time, online only, professional Master's program aimed at high school teachers. The MMT is an outreach program created to strengthen the mathematics abilities of teachers and enrich their appreciation of the breadth and utility of the discipline. Most teachers in the program teach full-time while taking one or more courses each term. The primary goal of the program is to help current teachers deepen their knowledge of mathematics. A secondary goal is to help teachers become aware of the breadth of the mathematical sciences.

The MMT is housed in the [Centre for Education in Mathematics and Computing](#), which is a unit within the Faculty of Mathematics. The faculty members who participate in the MMT come from almost all units in the Faculty of Mathematics. Each of these faculty members has primary duties within his or her home unit, and then participates in the MMT with consent from his or her Chair/Director. Despite the fact that there are no faculty members whose primary responsibility is to the MMT, the program receives strong support and commitment from across the Faculty, chiefly in the form of support from units in allowing some of their best instructors to participate in MMT course development and instruction and in providing many of their highest-rated teaching assistants to MMT courses.

Since the MMT is a course-based, part-time, professional Master's program, there is no explicit traditional research component to the program, nor is funding available from the University to MMT students. The MMT does have a "supervision component" through its capstone project, which is a required component of the program taken by each student through the course [MATH 699](#). Through their work in MATH 699, students will design a mini-course on an approved subject in mathematics. As part of their project, students are required to design lessons and create problems and solutions to accompany these lessons. The capstone project is designed to give students an opportunity to work on an independent project that demonstrates their knowledge of the subject matter that they teach and/or the knowledge that they have gained in the program and to provide a forum for bringing that knowledge into their own classroom.

The MMT was launched in September 2010. As such, the review done in 2015/2016 was its first cyclical review. The review was done early to align with reviews being done across the Faculty of Math.

The reviewers' provided the following summary of the program, along with six recommendations:

"The MMT program has far-reaching implications for mathematics education, improving the skills of mathematics teachers benefits secondary students provincially, nationally, and internationally. The program effectively surpasses the mandate of the degree."

Recommendations:

1. "Consideration should be made to separating the role of the program coordinator from the Director of CEMC. There are too many expectations in each of the roles for one person. It would also allow for greater cohesion if the tasks were divided."

Status: In Progress

Details: The CEMC agrees that these roles should be split and aims to do so in 2019/2020. This has taken longer than anticipated because of a previously committed administrative leave for the current CEMC Director in 2017/2018, as well as the difficulty in training a new person to be Acting Director of CEMC for a year and a person to be the new Director of the MMT simultaneously, and other commitments for appropriate candidates for MMT Director.

2. "The regulations and guidelines within the Graduate Studies Office should be reviewed to better match the living experiences of part-time online students. It should be possible for MMT students to elect one, two or three term absences without penalty. The part-time online professionals (normally teachers) have different needs than full-time on campus students."

Status: Completed

Details: The specific issue of inactive terms has been solved. There are likely to always be nuances for the type of program than with more traditional graduate programs that bear discussion with the GSPA.

3. "We suggest that the Faculty of Mathematics investigate the possibility that the part-time online model of the MMT be used for expanding to other markets for different fields within Mathematics. However, it should be recognized that the online model does not scale easily: interactions with students through email and discussion boards takes significant time. That is, the online model works well only with relatively small class sizes (unless there is significant additional instructional support)."

Status: N/A

Details: This recommendation is beyond the scope of the MMT program. The Faculty of Mathematics certainly continues to expand its online presence.

4. "The wording of the admission requirements posted on the MMT website (<http://cemc.uwaterloo.ca/mmt/mmt-admissions.html>) should be reviewed, with an eye to aligning the wording with current practice and encouraging any applicant who is actively teaching in mathematics, science, or computer science (not just those with a Bachelor's degree in a STEM field) to apply provided they have taken at least 3-4 post-secondary courses in mathematics."

Status: **Complete**

Details: Relevant calendar changes were approved and came into effect in 2017/2018.

5. "The development of a curriculum map to visualize the co-/prerequisite structure of the courses in the MMT program would be helpful."

Status: **In progress**

Details: We aim to publish this in Spring 2019 along with more useful lists of MMT courses broken down by GDLEs, by style of course, etc.

6. "Now that the program is mature and there is a good selection of courses available, it is worth considering whether the program would benefit from establishing a set of core requirements to ensure as complete a coverage of the GDLEs as possible. Core requirements should include at least MATH 600, 692, and MATH 699. Additional requirements could be MATH 647, 661, 680, and one of MATH 630 or 631. Alternatively, additional requirements could be set up by area (e.g., student must complete at least X credits in courses with a modelling component, Y credits in courses with a computing component, etc.)."

Status: **Complete**

Details: After significant discussion at the program level and within the Faculty, it was decided to formally create a set of core requirements that include the half-term introductory courses [MATH 600](#) (Software) and [MATH 692](#) (Proofs), the Capstone Project course [MATH 699](#) (which was already required), and the new course [MATH 681](#) (Problem Solving). The core requirements were not expanded beyond this set in an explicit effort to maintain one of the original goals of affording flexibility to the teachers in the program. Since teachers only take 9 courses to complete the degree, we did not want to require more than the equivalent of 3 courses. This allows teachers to tailor their course selection to their background and to the usefulness pertaining to the vastly varied circumstances in which they teach. We believe that the upcoming appropriate

categorizations of courses referred to in #5 above will assist teachers in choosing courses.

Explain any circumstances that have altered the original implementation plan

Recommendation 3 was not implemented as discussed in the section above.

Address any significant developments or initiatives that have arisen since the program review process, or that were not contemplated during the review

The MMT continues to grow and thrive. Our incoming class in Fall 2018 includes roughly 105 teachers, as compared to 70 in each of the past several classes. If this growth continues, we will need to work with the Faculty of Math to think more about resourcing both the administration of the program and the instruction of individual courses.

Updated Implementation Plan:

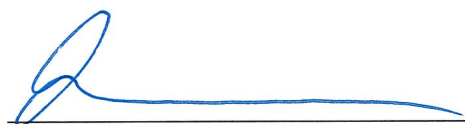
	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	Consideration should be made to separating the role of the program coordinator from the Director of CEMC. There are too many expectations in each of the roles for one person. It would also allow for greater cohesion if the tasks were divided.	Positions will be separated	Ian VanderBurgh, Director of CEMC and MMT	2019/2020
2.	The regulations and guidelines within the Graduate Studies Office should be reviewed to better match the living experiences of part-time online students. It should be possible for MMT students to elect one, two or three term absences without penalty. The part-time online professionals (normally teachers) have different needs than full-time on campus students.	Completed		
3.	We suggest that the Faculty of Mathematics investigate the possibility that the part-time online model of the MMT be used for expanding to other markets for different fields within Mathematics. However, it should be recognized that the online model does not scale easily: interactions with students through email and discussion boards takes significant time. That is, the online model works well only with relatively small class sizes (unless there is significant additional instructional support).	N/A Beyond the scope of the MMT	N/A	N/A

4.	The wording of the admission requirements posted on the MMT website (http://cemc.uwaterloo.ca/mmt/mmt-admissions.html) should be reviewed, with an eye to aligning the wording with current practice and encouraging any applicant who is actively teaching in mathematics, science, or computer science (not just those with a Bachelor's degree in a STEM field) to apply provided they have taken at least 3-4 post-secondary courses in mathematics.	Completed		
5.	The development of a curriculum map to visualize the co-/prerequisite structure of the courses in the MMT program would be helpful.	Map and categorization of courses to be created	Ian VanderBurgh, Director of MMT	Spring 2019
6.	Now that the program is mature and there is a good selection of courses available, it is worth considering whether the program would benefit from establishing a set of core requirements to ensure as complete a coverage of the GDLEs as possible. Core requirements should include at least MATH 600, 692, and MATH 699. Additional requirements could be MATH 647, 661, 680, and one of MATH 630 or 631. Alternatively, additional requirements could be set up by area (e.g., student must complete at least X credits in courses with a modelling component, Y credits in courses with a computing component, etc.).	Completed		

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.

Date of next program review: 2022/2023

Signatures of Approval:



Chair/Director

26 Sept 2018

Date

AFIW Administrative Dean/Head (For AFIW programs only)

Date



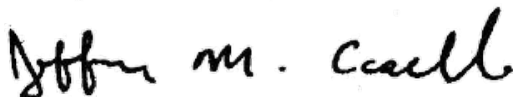
Faculty Dean

2018-09-26

Date

Associate Vice-President, Academic
(For undergraduate and augmented programs)

Date



April 26, 2018

Associate Vice-President, Graduate Studies and Postdoctoral Affairs
(For graduate and augmented programs)

Date

Checklist for SUC/SGRC Reviewer Feedback

Quality Assurance Office

Two-Year Progress Report: MMT

Name of Reviewer: Bruce Muirhead

Date: 5/28/2019

Does the Two-Year Progress Report:

- | | | |
|--|---|-----------------------------|
| 1. Clearly describe progress achieved on the various action items in the implementation plan? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. Explain convincingly any circumstances that would have altered the original implementation plan? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. For items that are behind schedule, propose an amended implementation schedule that is reasonable and credible? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Address significant developments or initiatives that have arisen since the program review process, or that were not contemplated by the program review process? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

General Comments

As noted by the reviewers, this program has been conceived and taught to a high standard. As they note, “the program effectively surpasses the mandate of the degree.” It has also grown from one course in 2010 to a suite of 24 courses by 2016. This is remarkable progress. This is enhanced by the fact that instructors respond to online questions within 24 hours(!), and that all courses are offered every year or every second year, speaks to a well-run program. Indeed, MMT seems to be doing everything right, including increasing course enrolments in this critical area.

Program strengths were clearly stated by the reviewers – and they are substantial. Challenges were similarly handled, but I believe that the Faculty has done its best to address those within its purview. The fact that MMT had about 105 admissions in its Fall 2018 cycle speaks volumes. Clearly, this is a program in demand.

Requested Revisions

The program has responded appropriately to all recommendations, with 3 of 6 recommendations implemented, one not dealt with as it lies outside the program’s parameters, with the remaining two recommendations in process. There is no doubt that they, too, will be fulfilled.



Two-Year Progress Report

Intercultural German Studies (MA)

July 2019

Background

This joint program with the University of Mannheim, Germany, was first accredited in 2011, and has not had a previous review before this one. A self-study for the *MA Intercultural German Studies* delivered by the Department of German and Slavic Studies (GSS) was submitted to the Associate Provost, Graduate Studies (APGS) [now Associate Vice President Graduate Studies and Postdoctoral Affairs], in September 2016, followed by a site visit by external reviewers in October 2016. A Final Assessment Report that provided a synthesis of the external evaluation and the internal response and assessments of this program was approved by Senate in October 2017.

Progress on Implementation Plan:

Recommendations

1. Change of admission requirements

Status: **completed**

Details: The recommendation was “to open [the program] to students [in] general German major programs...as well as in other fields in the humanities and social sciences.” The admission requirement was changed to: “A four-year Honours Bachelor’s degree (or equivalent) in German Studies or a four-year Honours Bachelor’s degree in the Humanities and Social Sciences if evidence justifying admission is offered (with sufficient German proficiency; normally level B2).” This was approved by Graduate Affairs Group (GAG) in Winter 2017 and became effective in Fall 2017.

The Fall 2017 change in admission criteria did not immediately result in a positive change in recruitment, as the Canadian admission to the program was only 1 student. However, in 2019, the Department has admitted 3 domestic students to the IcGS program.

2. Create a study position for a US student

Status: **in progress**

Details: The recommendation was “that the University of Waterloo facilitate the allocation of the funds to support one member of each year’s cohort from the United States.” The Department, together with the Dean of Arts, and the Provost, are currently discussing the finalization of this recommendation. The Dean has indicated his support for funding such a study position. Annual funding began in 2019, however the program

was not able to enrol a US student last year. Instead, the Department was given the go-ahead to admit an international student who just completed a BA at Western to the program. The program will be advertised robustly in the United States for the next admission cycle, given that the new Dean of Arts is still supportive of this initiative.

3. Promotion of the program at home and abroad

Status: **some completed, some in progress**

Details: The recommendation was that “Graduate Studies and the Faculty of Arts provide ample support for the production and dissemination of both paper and digital promotional materials, including posters, brochures, fliers, etc.” The reviewers also recommended the Department should “consider facilitating travel of current students or recent graduates to institutions around Canada to promote the program.” A meeting in January 2018 between the Department’s Chair, the Graduate Officer and the Arts Communication Officer facilitated these recommendations. With resources provided by the Faculty of Arts (photographer, designer), a new flyer for the IcGS MA program was designed and printed. Resources for travel for current students to promote the program have not been provided; however, those students travelling to conferences have promoted the program there. The Graduate Officer, as well as colleagues and students, have promoted the program widely at UW (in courses, at study fairs, to colleagues and students) as well as nationally in Canada (on listservs, at conferences, to colleagues and students). Systematic tracking of alumni has not been implemented due to limitations on staff time. The Department is currently seeking sustainable solutions to this ongoing problem.

The Department has recently improved tracking by using Facebook, LinkedIn, personal contacts, and a direct email blast. There is now an up-to-date database of alumni who have given permission to be contacted. In conjunction with our German colleagues, the Department is hosting an annual day in Mannheim/Germany with presentations and informal gatherings, and is also planning a regular newsletter to keep in touch with alumni and advertise for the program.

4. Importance of campus profile and visibility

Status: **in progress**

Details: The reviewers’ recommendation was to “encourage the Faculty of Arts and the Graduate Studies Office (now Graduate Studies and Postdoctoral Affairs) to highlight the IcGS program as a model of intercultural engagement and international institutional cooperation and experiential learning.” While the new IcGS flyer and the student videos will help with visibility on campus, the Department would welcome other ways to “highlight the IcGS program” (e.g. feature article in Arts brochure).

Recently, the Department has met with the Arts recruitment and marketing specialist and is in discussions about a feature article in the Arts brochure. The Department has also refreshed their Facebook presence and established an Instagram account to continually

promote the program. In addition, the website has been updated and the Department is dedicating resources to keep the website fresh and up-to-date as a survey has shown that this is the first point of entry for potential graduate students to the program.

5. Advising of students.

Status: **complete**

Details: The recommendation was for pre-departure workshops before students go to Germany as well as enhanced advising upon their return, as well as advising for the summer period during study abroad. The pre-departure workshops have now put into place, organized by the Graduate Officer, and as part of GER 600/700 (Research Methods). Through regular meetings with the Graduate Officer, faculty mentors, and advisors, there is now also a better advising system in place during the other months.

6. Funding

Status: **complete**

Details: The recommendation was to market the program as “fully funded.” While the program is indeed very well-funded, the Department has been hesitant to promote it as “fully funded,” since students applying for the program may understand this differently, and since supplemental funding secured through German/Erasmus funds are subject to change annually. The wording the Department has chosen instead in its flyer is: “Students receive scholarships and teaching or research assistantships covering standard tuition, travel, and living expenses at Waterloo and Mannheim.”

Explain any circumstances that have altered the original implementation plan

There are no alterations to the original implementation plan.

Address any significant developments or initiatives that have arisen since the program review process, or that were not contemplated during the review

The recent confirmation by the Dean of Arts to provide a special funding package for a US student will allow a US student to enter the program each year, starting with 2019. This will make the program more attractive nationally as well as internationally. For this joint program, the German partners (Mannheim University) secured a second round of [Erasmus+](#) funding, which will provide additional funding for all students in the program as well as allow staff exchanges to strengthen the ties for the program.

Updated Implementation Plan

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	<i>Change of Admission Requirements</i>	Graduate Officer rewrote admission requirements	Graduate Officer	Complete: November 2016 – vote in Department done; W 2017 – passed GAG
2.	<i>Study position for a US student</i>	Initial discussion with Linda Warley and Jeff Casello at December 2016 departmental meeting, further discussions with Dean June-July 2018	Graduate Officer/Chair initiated discussion; resourcing beyond department	Complete: Confirmation by the Dean of Arts July 2018 Annual funding to start in 2019
3.	<i>Promotion of the program at home and abroad</i>	<ul style="list-style-type: none"> • Promotion emails to German Studies lists in Canada/internationally, emails to colleagues at universities in the US sent; create IcGS flyer • Explore possibility of student travel for promotion • Devise strategies for better tracking of alumni • Promoting in first and second year courses (1st priority) 	Graduate Officer/GSS faculty; Graduate Officer/Faculty Associate Dean of Arts Pending on resourcing beyond department Department/Alumni Officer UG Officer	Recurrent: promotion emails done since Fall 2016; recurrent: will be done every year; complete: IcGs flyer Recurrent: student recruitment travel funds to be applied to with Associate Dean, Grad Studies on a case by case basis In progress and ongoing Complete since Fall 2017 – recurring: to be done in Fall and Winter terms & Bamberg Summer School
4.	<i>Campus profile and visibility</i>	Find strategy/plan for opportunities to promote the IcGS program on campus	Chair/Graduate Officer, Arts Communication Manager	In progress

5.	Advising of students a) Pre-departure (esp. German system) b) Return and summer advising	a) Make part of Fall workshops b) Discuss and create advising procedure plan	Graduate Officer, Library Liaison Graduate Officer/Department	Complete: in place since Fall 2017 Complete: new procedure implemented April 2017
6.	Funding	Explore other potential funds to leverage the costs for this international program	GSS faculty, Chair	Recurrent: in Fall (before application cycle) on a yearly basis.

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.



Date of next program review: _____

_____ Date

Signatures of Approval:

Chair/Director

24.05.2018

_____ Date

AFIW Administrative Dean/Head (For AFIW programs only)

_____ Date

Faculty Dean

25/ix/18

_____ Date

Associate Vice-President, Academic
(For undergraduate and augmented programs)

_____ Date

December 10, 2018

Associate Vice-President, Graduate Studies and Postdoctoral Affairs
(For graduate and augmented programs)

_____ Date



Final Assessment Report

Nanotechnology Collaborative Program

(MSc, MAsC, PhD)

May 2019

Summary of the Program Review:

In accordance with the University's Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the collaborative program in Nanotechnology (Nano program) delivered by the Faculty of Science and the Faculty of Engineering. Six departments collaborate on the program: Chemistry, Physics and Astronomy, Chemical Engineering, Electrical and Computer Engineering, Mechanical and Mechatronics Engineering, and Systems Design Engineering. A self-study (Volume I) was submitted to the Associate Vice-President, Graduate Studies and Postdoctoral Affairs on May 15, 2017. The self-study presented the program descriptions and learning outcomes, an analytical assessment of these programs, including the data collected from a student survey along with the standard data package prepared by the Office of Institutional Analysis & Planning (IAP). The CVs for each full-time faculty member in the Department were included in Volume II of the self-study.

Two arm's-length external reviewers were selected from Volume III of the self-study. Dr. Pulickel Ajayan, Professor of Materials Science and NanoEngineering, Rice University, and Dr. Spiros Pagiatakis, Professor of Earth Sciences and Geomatics Engineering, University of Toronto were selected by the Associate Vice-President, Graduate Studies and Postdoctoral Affairs, as well as one internal reviewer (Dr. Paul Malone, Associate Professor from the Department of Germanic and Slavic Studies).

Reviewers appraised the self-study documentation and conducted a site visit to the University on May 25-26, 2017. The visit included interviews with the Associate Vice-President, Graduate Studies and Postdoctoral Affairs; Dean of Engineering; Dean of Science; Associate Deans of Graduate Studies, Engineering and Science; Director of the Program, Department Chairs, Graduate Nanotechnology Committee members, faculty members, staff and current graduate students. The review team also had an opportunity to visit meet with representatives from the Library and to tour laboratories in the Quantum-Nano Centre.

This final assessment report is based on information extracted, in many cases verbatim, from the self-study, the external reviewers' report and the program response.

Program characteristics:

The Graduate Nano program bridges the Faculties of Engineering and Science to provide a stimulating educational environment spanning basic research through to application. This collaborative program includes 12 separate degrees: master's and doctoral level degrees for each of the six departments in the Graduate Nano program.

Each member department maintains its own Graduate Nano program requirements, controls admission into its own master's and doctoral programs, coordinates student supervision, determines its own requirements for graduation and confirms that students have met those requirements before the University confers a degree. While each department has its own degree requirements, there are similarities among the member departments' requirements, including the nanotechnology core courses, the nanotechnology electives and the nanotechnology seminars.

Completion of the collaborative program is indicated by a transcript notation on the 'home' department's degree. The following degrees are currently offered:

- MSc and PhD in Chemistry (Nanotechnology)
- MSc and PhD in Physics (Nanotechnology)
- MSc and PhD in Chemical Engineering (Nanotechnology)
- MSc and PhD in Electrical and Computer Engineering (Nanotechnology)
- MSc and PhD in Mechanical and Mechatronics Engineering (Nanotechnology)
- MSc and PhD in Systems Design Engineering (Nanotechnology)

An MSc and PhD in Biology (Nanotechnology) were offered until 2015/16. However, effective September 2016, the Department of Biology suspended their participation in the Nano program due to minimal uptake from biology graduate students and a lack of congruency with the background and interests of biology students.

Summary of strengths, challenges and weaknesses based on self-study:**Strengths**

- **Multidisciplinary Focus:** Graduate Nano students can tailor their nanotechnology education by selecting unique combinations of courses from several disciplines to meet the requirements of their academic and/or employment goals. This inter-departmental collaboration in conjunction with the option to add a nanotechnology transcript notation to an established Waterloo degree is appealing to students.
- **Hands-on Lab Experience:** The faculty members who supervise Graduate Nano students are doing exciting nanotechnology research, using state-of-the-art technology and equipment. Prospective students know that the research they will conduct provides

opportunities for hands-on experience and learning, as well as meaningful skills that they can use elsewhere.

- **Research Output:** Waterloo's Graduate Nano program is attractive to a very high calibre of students, with excellent grades and relevant experience, who contribute to the University's reputation for innovation and high-quality research output. In the process of becoming independent scholars, these Graduate Nano students help Waterloo's faculty create and publish innovative research that is recognized on a global stage, thus elevating the institution's profile and credibility at home and abroad.
- **Nanotechnology Investment:** The University of Waterloo has invested significantly in nanotechnology, through both the Waterloo Institute for Nanotechnology and the creation of the undergraduate Nanotechnology Engineering program. The associated state-of-the-art facilities, cutting edge equipment and technology, and roster of distinguished nanotechnology experts on faculty, many of whom are world-class researchers, all contribute towards and benefit from the on-going success of the Graduate Nano program.

Challenges

- **Physical and Financial Resources:** Given its position as a collaborative program dependent on the involvement of several departments, the Graduate Nano program has no direct responsibility for or control over the physical and financial resources on which its students rely. Based on our discussions with departmental representatives and surveys of Graduate Nano students, each member department has appropriate physical and financial resources to support their students in the Graduate Nano program. What is missing, however, is a common space, where students from our member departments can meet, interact and socialize, while feeling that they are on 'common ground,' rather than in a particular department's space. A common space would encourage and facilitate a sense of community and collaborative endeavour among our students.
- **Competition for Students:** When it launched, Waterloo's Graduate Nano program was one of the first such programs in Canada and, therefore, faced little competition for students. The past few years have seen an increase in the number of international and domestic universities that offer graduate nanotechnology/nanoengineering/nanoscience programs, including John Hopkins, North Carolina State, UC Riverside, Guelph, Toronto, McGill and Alberta.
- **Program Promotion:** The program itself has no independent online presence or influence over the promotion that has been done on its behalf. Furthermore, with the program promoted in several places by many unique groups, it is difficult to track and manage the multiple unique presentations of program information.

Weaknesses

- **Program Funding:** Since its inception, the Graduate Nano program had no central budget to support its objectives and encourage long-term program enhancement. Member departments received per-student funding for those in the program, with no obligation to dedicate any of it to program-specific needs. There is no arrangement for support of the program as a whole. Support for a permanent full-time staff, program promotion, student recruitment and student funding would greatly enhance the operation and success of the program.
- **Student Support:** Because each member department is understandably focused on spending its funds for the greater good of its entire student population, the sub-set of Graduate Nano students is under-supported. Sufficient and on-going operating funds for Waterloo Institute for Nanotechnology Graduate Student Society (WINGSS) activities would give Graduate Nano students the capability to reduce home-department segmentation. Their activities could create a foundation for the relationship development that spurs the cross-pollination of ideas and, eventually, research partnerships.

Summary of key findings from the external reviewers:

Overall, the Collaborative Nanotechnology Graduate Program is unique in Canada and its nanotechnology research is multidisciplinary, collaborative and transformational. The uniqueness of the program is founded on its collaborative nature as six strong member departments contribute to it. The program naturally has its own growing challenges, particularly stemming from the undeveloped true coordination of the constituent departments, their lack of flexibility and the lack of central administrative organization of the academic curriculum. It is evident that the Faculties and Departments have a solid understanding of these issues and have already taken initial steps for remedial actions.

The two Faculties need to play a much stronger role in support of the program and the students by facilitating institutional organizational structure, providing oversight, student advocacy, compliance, coordination and facilitation of graduate study and post-doctoral fellowship programs to ensure consistent regulations and high impact research within the Quality Assurance Framework and Guidelines of the Ontario Universities Council on Quality Assurance (OUCQA).

Program response to external reviewer recommendations:

Recommendations

1. **Curriculum Authority:** *The program should consider that the current Graduate Nanotechnology Committee receive formal approval and responsibilities on curriculum matters with the aim to revise all courses related to the program.*

Response

- Determine if member department representatives on the Graduate Nano Committee may have responsibility for and authority to approve minor Graduate Nano Program core curriculum changes.
- Determine if, after approval of Curriculum Committee motions by the Graduate Nano Committee, those motions could be forwarded directly to the Faculty level, after approval via email from the Chairs or Associate Chairs of the member departments.
- Update: there is no agreement on either of these options.

2. **Full Time Administrative Coordinator:** *The program should consider that the Administrative Coordinator position become permanent. The administrative coordinator should serve in the Graduate Nanotechnology Committee and play a leading role in the student advisement.*

Response

- Maintain the administrative coordinator position at a part-time level.
- The administrative coordinator is already involved with the Graduate Nano Committee and student advisement, as appropriate, given that member departments advise their own students. The role will continue to act as a single point of contact for program-related questions from students, administrative staff and faculty that cannot be answered at a departmental level.
- Assign the administrative coordinator additional tasks related to the administration of the Curriculum Committee, online and recruitment communications, program promotion and administrative documentation.
- Monitor the administrative coordinator's program-related workload.
- Approach the Associate Deans of Graduate Studies for the Faculties of Science and Engineering, via the Program Director, if evidence indicates that the position requires increased FTE to support the collaborative program.

3. **Departmental Collaboration:** *The Graduate Nanotechnology Committee should work closely with the departments to develop a truly collaborative program by removing inflexible traditional administrative practices and developing effective interdependence among the founding departments. A more coordinated effort between departments and the Nanotechnology Program Committee should be considered for recruiting students with truly interdisciplinary interest.*

Response

- Investigate opportunities to enable Graduate Nano Committee members with limited departmental authority to approve changes on behalf of their department to reduce the complexity and increase the speed of the program's approval process.
- Create and maintain a centralized Graduate Nano Program section within the University's website (www.uwaterloo.ca/nano-graduate) that includes information about its various degree options and links directly to the program descriptions in the [Graduate Studies Academic Calendar](#).

- Collaborate with University - and member departments - to promote the Graduate Nano Program to potential students via the university website and departmental and Faculty recruitment events, as resources permit.
- Work with WINGSS and member departments to coordinate student-centric programs and events that will promote positive student experiences and collaboration among students in member departments.

- 4. Curriculum Map Task Force:** *The Graduate Nanotechnology Committee should consider forming a task force to develop a comprehensive curriculum map according to the Quality Assurance Framework and Guidelines of the Ontario Universities Council on Quality Assurance (OUCQA). This will provide the framework for developing clear pathways to achieving the specified program learning outcomes and degree level expectations. A handbook could be developed to provide clear documentation for the incoming students detailing expectations, requirements, time-lines and other important instructions for fulfilling the degree requirements.*

Response

- Create, with representatives from each member department, a Curriculum Committee that reports to the Graduate Nano Committee.
- Develop a comprehensive curriculum map.
- Review core course content, delivery and sequencing to ensure that the core course offerings are comprehensive, appropriate and delivered effectively.
- Recommend curriculum changes to the Grad Nano Committee.

After clear information for students regarding expectations, requirements, timelines and other important instructions will have been placed online in a new Graduate Nano website section, determine if a separate handbook would be useful for students.

- 5. Reduction in Required Courses:** *The program should consider reducing the number of required courses as partial fulfilment of the degree sought (particularly for PhD) in favour of intensification of research.*

Response

- This is outside of the power of the Graduate Nano Committee. However, this suggestion will be brought up with the Associate Chairs after the new Curriculum Committee has re-designed the nano courses.

- 6. Faculty Support:** *The supporting Faculties should consider providing more direct support to the program, facilitating institutional organizational structure, providing oversight, student advocacy, compliance, coordination and facilitation of graduate study and post-doctoral fellowship programs.*

Response

- Formalize the current Graduate Nano Program structure through an official document endorsed by the Deans of Science and Engineering.
- Secure program funding commitment from the two Faculties and six departments involved in the program.

- Create a governance document that outlines the various commitments, processes and expectations of the departments and Faculties involved in the program.
- Invite a Waterloo Institute for Nanotechnology Graduate Student Society (WINGSS) member to join Graduate Nano Committee meetings as a student advocate / representative.
- No involvement with the nanofellowships program from the Graduate Nano Committee is needed because the nanofellowships program is run by the Waterloo Institute for Nanotechnology (WIN).

7. Graduate Funding Model: *The graduate funding model should be revisited and revised to meet the needs of the graduate students. In addition, the member departments should provide a small annual flexible fund to the program for enabling nano-program centric activities, such as seminars and workshops that involve the students.*

Response

- The graduate funding model is outside the scope of the Graduate Nano Committee mandate.
- Maintain WINGSS' responsibility for creating an annual plan and budget for nano-program centric activities, such as seminars and workshops, and approaching the Program Director to request funding.
- Require WINGSS to continue developing annual budgets rather than engaging in long-term planning that would require multi-year, advanced funding commitments from departments.
- Approach the member department chairs to request investment into the budget, via the Program Director, if he/she approves the WINGSS budget and objectives.
- Maintain the department chairs' ultimate authority to determine the amount of support their department will provide to WINGSS.

Recommendations that were not selected for implementation:

Research Promotion: *The program should consider developing a plan for promoting nanotechnology research to industry. This plan should also include mentorship activities that promote collaborative research between academia and industry.*

Response

- WIN promotes nanotechnology research to industry, and there is no need for the Graduate Nano program to duplicate its efforts.



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Implementation Plan:

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	Curriculum Authority: The program should consider that the current Graduate Nano Committee receive formal approval and responsibilities on curriculum matters with the aim to revise all courses related to the program.	<ul style="list-style-type: none"> Determine if member department representatives on the Graduate Nano Committee may have responsibility for and authority to approve (minor) Graduate Nano Program core curriculum changes. Determine if, after approval of Curriculum Committee motions by the Graduate Nano Committee, those motions could be forwarded directly to the Faculty level – ensuring the opportunity for departmental review of changes while eliminating the time-consuming process now required to attain formal multi-departmental approval. If possible, grant authority to Graduate Nano Committee to approve curriculum matters in the program 	<p>Program Director</p> <p>Program Director</p> <p>Deans and Chairs</p>	<p>Update: we are unable to make these changes.</p> <p>Update: we are unable to make these changes.</p> <p>Update: we are unable to make these changes.</p>

2.	<p>Full-Time Administrative Coordinator: The program should consider that the administrative coordinator position become permanent. The administrative coordinator should serve in the Graduate Nano Committee and play a leading role in student advisement.</p>	<ul style="list-style-type: none"> Maintain the administrative coordinator position at a part-time level. The administrative coordinator is already involved with the Graduate Nano Committee and student advisement, as appropriate, given that member departments advise their own students. The role will continue to act as a single point of contact for program-related questions from students, administrative staff and faculty that cannot be answered at a departmental level. Assign the administrative coordinator additional tasks related to the administration of the Curriculum Committee, online and recruitment communications, program promotion and administrative documentation. Monitor the administrative coordinator's program-related workload. Approach the associate deans of graduate studies for the Faculties of Science and Engineering via the program director, if evidence indicates that the position requires more time. 	<p>Administrative Coordinator</p> <p>Administrative Coordinator</p> <p>Program Director</p> <p>Program Director</p>	<p>On-going</p> <p>On-going</p> <p>On-going</p> <p>On-going</p>
3.	<p>Departmental Collaboration: The Graduate Nano Committee should work closely with the departments to develop a truly collaborative program by removing inflexible traditional administrative practices and developing effective interdependence among the founding departments. A more coordinated effort between departments and the Graduate Nano Committee should be considered for recruiting students with truly interdisciplinary interest.</p>	<ul style="list-style-type: none"> Investigate opportunities to invest Graduate Nano Committee members with limited departmental authority to approve changes on behalf of their department to reduce the complexity and increase the speed of the program's approval process. Create and maintain within the University's website a centralized Graduate Nano Program section that includes information about its various degree options. Collaborate with University- and member department-resources to promote the Graduate Nano Program to potential students. Work with WINGSS and member departments to coordinate student-centric programs and events that will promote positive student experiences and collaboration among students in member departments. 	<p>Program Director</p> <p>Administrative Coordinator</p> <p>Administrative Coordinator</p> <p>Administrative Coordinator</p>	<p>Update: we are unable to increase our authorities.</p> <p>Completed</p> <p>Ongoing</p> <p>Ongoing</p>

4.	Curriculum Map Task Force: The Graduate Nanotechnology Committee should consider forming a task force to develop a comprehensive curriculum map according to the Quality Assurance Framework and Guidelines of the Ontario Universities Council on Quality Assurance (OUCQA). This will provide the framework for developing clear pathways to achieving the specified program learning outcomes and degree level expectations. A handbook could be developed to provide clear documentation for the incoming students detailing expectations, requirements, time-lines and other important instructions for fulfilling the degree requirements.	<ul style="list-style-type: none"> • Create, with representatives from each member department, a Curriculum Committee that reports to the Graduate Nano Committee. • Develop a comprehensive curriculum map. • Review core course content, delivery and sequencing to ensure that the core course offerings are comprehensive, appropriate and delivered effectively. • Recommend curriculum changes to the Grad Nano Committee. • After clear information for students regarding expectation, requirements, timelines and other important instructions has been posted online in a new Graduate Nano website section, determine if a separate handbook would be useful for students. (See <i>Recommendation</i> – Error! Reference source not found.). 	Program Director Curriculum Committee Curriculum Committee Curriculum Committee Graduate Nano Committee	One term – completed Ongoing – pending departmental approvals
5.	Intensification of Research: The program should consider reducing the number of required courses as partial fulfilment of the degree sought (particularly for PhD) in favour of intensification of research.	<ul style="list-style-type: none"> • Discuss after finalizing the grad course schedule and learning outcomes. • Suggest changes to the Graduate Nano Committee 	Curriculum Committee	Completed – pending departmental approvals

6.	Faculty Support: The supporting Faculties should consider providing more direct support to the program, facilitating institutional organizational structure, providing oversight, student advocacy, compliance, coordination and facilitation of graduate study and post-doctoral fellowship programs.	<ul style="list-style-type: none"> Formalize the current Graduate Nano Program structure through an official document endorsed by the Deans of Science and Engineering. Secure program funding commitment from the two Faculties and six departments involved in the program. Create a governance document that outlines the various commitments, processes and expectations of the departments and Faculties involved in the program. Invite a WINGSS member to join Graduate Nano Committee meetings as a student advocate/representative. No involvement with the nanofellowships program from the Graduate Nano Committee is needed because the nanofellowship program is run by WIN. 	<p>Program Director</p> <p>Program Director</p> <p>Administrative Coordinator</p> <p>Program Director</p>	<p>Pending departmental approvals</p> <p>One year – Mar. 2019</p> <p>Pending departmental approvals</p> <p>Completed</p>
7.	Graduate Funding Model: The graduate funding model should be revisited and revised to meet the needs of the graduate students. In addition, the central administration should provide a small annual flexible fund to the program for enabling nano-program centric activities, such as seminars and workshops that involve the students.	<ul style="list-style-type: none"> The graduate funding model is outside the scope of the Graduate Nano Committee mandate. Maintain WINGSS' responsibility for creating an annual plan and budget for nano-program centric activities, such as seminars and workshops, and approaching the program director to request funding. Require WINGSS to continue developing annual budgets rather than engaging in long-term planning that would require multi-year, advanced funding commitments from departments. Approach the member department chairs to request investment into the budget, via the program director, if he/she approves the WINGSS budget and objectives. Maintain the department chairs' ultimate authority to determine the amount of support their department will provide to WINGSS. 	<p>Program Director</p> <p>Program Director</p> <p>Program Director</p> <p>Graduate Nano Committee</p>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.

Date of next program review:

2022-2023

Date

Signatures of Approval:




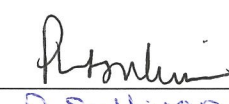
26 Oct. 2018

Chair/Director

Date

AFIW Administrative Dean/Head (For AFIW programs only)

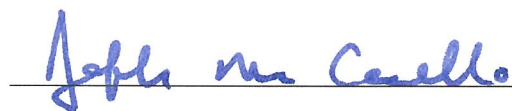
Date


Faculty Dean R.P. Lemieux
Dean of Science
P. Sullivan
Dean of Engineering 29 Oct 2018

Date

Associate Vice-President, Academic
(For undergraduate and augmented programs)

Date



13 November 2018

Associate Vice-President, Graduate Studies and Postdoctoral Affairs
(For graduate and augmented programs)

Date

University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Report to Senate
21 October 2019

Senate Undergraduate Council met on 10 September 2019 and agreed to forward the following items to Senate. Council recommends that these items be included for information or approval, as noted, in the consent agenda.

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

FOR APPROVAL

ACADEMIC PLAN & REGULATION CHANGES

Faculty of Science

Co-operative Program Requirement Changes

1. **Motion:** To approve the proposed revisions to the co-operative program requirements for BSc Science programs as described below, effective 1 September 2020.

Rationale: The number of required work-term reports required by all BSc Science programs, with the exception of BSc Psychology, is being reduced from four to three.

This change is intended to reduce both work load and stress for students in the following ways:

1. When PD courses were introduced several years ago, the workload for co-op students was increased by four courses. Nothing was removed from their programs at the time. A reduction in the number of required work-term reports can restore the workload to a more reasonable value.
2. Co-op has recently implemented a rule requiring employers to end work terms at least one week before the start of the next semester. This was done so that students can have some free time to recover between semesters. Reducing the number of required work-term reports further allows students to take advantage of this short break and start the semester more rested.

Communication skills are improving with the implementation of a mandatory first year communication course. As such future work-term reports should be of higher quality.

Only three work-term reports are required for accreditation, therefore, our co-op programs will still be accredited with implementation of this change.

This change will be made retroactively to fall 2015 (affecting 2015-2016, 2016-2017, 2017-2018, 2018-2019, and 2019-2020 Calendars) so that most current students (including any that may have taken a year off or changed their sequence) can benefit from this change. Changes will not be reflected in Calendar pages dating back to 2015. Instead, requirement templates for appropriate BSc programs will be updated back to the 2015 requirement term, allowing either three or four work-term reports. Advisors will let students know that a reduced work-term report requirement will be accepted, when appropriate.

All BSc co-op program pages will be updated to show the reduced number of work-term reports (when applicable), while bringing consistency to the wording and location of the co-op requirements for each

program. Co-op requirements will be linked to a new “Co-operative Program Requirements” Calendar page within the Faculty of Science (see below for new page text and background). Reference to CECA, PD, and science work-term guideline links will be removed from all co-op program pages so as not to repeat information available on the “Co-operative Program Requirement” page. Changes to the BSc co-op program pages will occur as noted in one of the five examples below:

Example 1: Honours Co-operative Chemistry shown

The same changes will be made for:

Honours Co-operative Chemistry (with and without specialization), Honours Co-operative Biochemistry (with and without specialization), Honours Co-operative Geochemistry, Honours Co-operative Medicinal Chemistry, Honours Co-operative Materials and Nanosciences, Honours Co-operative Life Physics (with and without specialization), Honours Co-operative Mathematical Physics, Honours Co-operative Physics, and Honours Co-operative Physics and Astronomy programs.

This program, which offers the Honours Chemistry courses integrated with five four-month work terms, extends over four and two-thirds years. Students work and study in alternate terms starting at the end of the 2A term. There is a double work term between terms 3B and 4A. ~~Co-op program information requirements are located in the Co-operative Education and Career Action (CECA) section of this Calendar and in the Science Faculty work term report guidelines. WatPD course information is located on the Professional Development website.~~

.....

1. 22.0 units that include:
 - 9.0 units of required CHEM courses: CHEM 100, CHEM 120, CHEM 120L, CHEM 123, CHEM 123L, CHEM 140, CHEM 200, CHEM 212, CHEM 220, CHEM 220L, CHEM 221, CHEM 233, CHEM 240, CHEM 250L, CHEM 254, CHEM 264, CHEM 265, CHEM 265L, CHEM 313L, CHEM 356, CHEM 494A, and CHEM 494B
 - 1.0 unit of required MATH courses: MATH 127 and MATH 128
 - 1.5 units of required PHYS courses: PHYS 111/PHYS 111L or PHYS 121/PHYS 121L; and PHYS 112/PHYS 112L or PHYS 122/PHYS 122L
 - 10.0 electives distributed as follows:
 - 5.5 units of CHEM from the list of program electives with the following additional restrictions:
 - a minimum of 1.0 lab unit from CHEM 224L, CHEM 310L, CHEM 350L, and CHEM 360L
 - a minimum of 1.5 lecture units from CHEM 310, CHEM 313, CHEM 323, CHEM 350, and CHEM 360, with a minimum of 0.5 unit chosen from CHEM 310 and CHEM 313
 - a minimum of 2.0 lecture units from 400-level courses
 - 0.5 unit chosen from AMATH, CO, MATH, PMATH, or STAT courses. Students should contact their academic advisor for a list of recommended courses
 - 4.0 units chosen from any 0.5 unit lecture or lab course
 - 0.5 ENGL unit: ENGL 193/SPCOM 193
2. Full-time enrolment in Years Two, Three, and Four.
3. Co-operative program requirements that include:
 - A minimum of four work terms: COOP 1, COOP 2, COOP 3, and COOP 4.
 - A minimum of three work-term reports: one as part of PD 11, WKRPT 200S, and WKRPT 300S.

- A minimum of four Professional development courses: PD 1 and PD 11 and two other PD courses.
- 3. ~~A minimum of four work terms, four satisfactory work reports (including PD 11), and credit in four WatPD courses (PD 1, PD 11, and two other PD courses).~~

Example 2: Honours Co-operative Biology shown

The same changes will be made for:

All the Honours Co-operative Biology Specializations.

.....

Continuing in Honours Co-operative Biology requires a cumulative overall average of 60%, a cumulative Science average of 60%, and a cumulative Biology average of 60%.

Successful completion of this program requires:

1. 21.5 units distributed as follows:
 - 5.5 BIOL units: BIOL 110, BIOL 120, BIOL 130, BIOL 130L, BIOL 150, BIOL 165, BIOL 239, BIOL 240, BIOL 240L, BIOL 273, BIOL 308, and BIOL 359
 - 5.5 BIOL units 300-level or higher with the following condition:
 - 2.5 units must be 400-level
 - 3.0 CHEM units: CHEM 120, CHEM 120L, CHEM 123, CHEM 123L, CHEM 237, CHEM 237L, CHEM 266, and CHEM 266L
 - 0.5 Science elective unit
 - 0.5 unit program elective chosen from: MATH 114, MATH 127, or PHYS 111
 - 0.5 STAT unit: STAT 202
 - 5.5 elective units
 - 0.5 ENGL unit: ENGL 193/SPCOM 193
2. Co-operative program requirements that include:
 - A minimum of four work terms: COOP 1, COOP 2, COOP 3, and COOP 4.
 - A minimum of three work-term reports: one as part of PD 11, WKRPT 200S, and WKRPT 300S.
 - A minimum of four Professional development courses: PD 1 and PD 11 and two other PD courses.

Additional Program Conditions:

1. A maximum of 3.0 SCI units may be counted toward this program.
2. A maximum of 5.0 failed units is permitted.
3. A failed second attempt of a required course will result in removal from the program (see Faculty of Science policy on repeating courses).
4. ~~Detailed information on co-op program requirements is in the Co-operative Education and Career Action (CECA) section of this Calendar and in the Faculty of Science work term report guidelines. Co-operative education requirements include:~~
 - ~~A minimum of four work terms~~
 - ~~Four WatPD (professional development) courses that must include PD 1, PD 11, and two PD elective courses~~
 - ~~Four work term reports:~~
 - * ~~One completed as part of PD 11~~
5. ~~Three completed in required WKRPT courses: WKRPT 200S, WKRPT 300S, and WKRPT 400S~~

Example 3: Honours Co-operative Earth Sciences, Geology Specialization is shown

The same changes will be made for:

All the Honours Co-operative Earth Sciences programs, the Honours Co-operative Environmental Science programs, the Honours Co-operative Science and Business programs, and the Honours Biotechnology/Economics program.

.....

Successful completion of this program requires:

1. 21.5 units that include:
 - 9.0 EARTH units: EARTH 121, EARTH 121L, EARTH 122, EARTH 122L, EARTH 123, EARTH 221, EARTH 223, EARTH 231, EARTH 232, EARTH 235, EARTH 238, EARTH 260, EARTH 331, EARTH 332, EARTH 333, EARTH 342, EARTH 358, EARTH 390, and EARTH 471
 - 1.0 EARTH unit: EARTH 436A and EARTH 436B; or EARTH 499 and one EARTH elective at 300-level or higher
 - 3.0 EARTH elective units with the following conditions:
 - 0.5 unit must be 200-level or higher
 - 2.5 units must be 300-level or higher
 - 1.5 CHEM units: CHEM 120, CHEM 120L, CHEM 123, and CHEM 123L
 - 1.5 PHYS units: PHYS 111 and PHYS 111L or PHYS 121 and PHYS 121L; PHYS 112 and PHYS 112L or PHYS 122 and PHYS 122L
 - 1.5 MATH units: MATH 106 or MATH 114; MATH 127 and MATH 128
 - 0.5 STAT unit: STAT 202
 - 1.0 program elective unit chosen from any 200-level or higher BIOL, CHEM, PHYS, MATH, AMATH course or chosen from BIOL 120, BIOL 130, BIOL 150, CS 115, or CS 116
 - 0.5 ENGL unit: ENGL 193/SPCOM 193
 - 2.0 elective units; must be 0.5 unit lecture courses
2. Co-operative program requirements that include:
 - A minimum of four work terms: COOP 1, COOP 2, COOP 3, and COOP 4.
 - A minimum of three work-term reports: one as part of PD 11, WKRPT 200S, and WKRPT 300S.
 - A minimum of four Professional development courses: PD 1 and PD 11 and two other PD courses.
- ~~2. Co-operative education requirements that include:~~
 - ~~○ A minimum four work terms~~
 - ~~○ Four WatPD (professional development) courses that must include PD 1, PD 11, and two PD elective courses~~
 - ~~○ Four work term reports:~~
 - ~~▪ One complete as part of PD 11~~
 - ~~▪ Three completed in required WKRPT courses: WKRPT 200S, WKRPT 300S, and WKRPT 400S~~

Notes

1. SCI and EARTH courses may not be counted as program electives.
2. A maximum of 1.5 SCI units may be counted as electives.
- ~~3. Additional co-op program information is located in the Co-operative Education and Career Action (CECA) section of this Calendar and in the Science Faculty work term report guidelines.~~

Example 4: Honours Biotechnology/Chartered Professional Accountancy, where only four work term opportunities exist.

.....

Successful completion of this program requires:

1. 22.0 total units distributed as follows:
 - 8.0 Science units distributed as follows:
 - 4.75 BIOL units: BIOL 130, BIOL 239, BIOL 240, BIOL 240L, BIOL 241, BIOL 309, BIOL 331, BIOL 342, BIOL 432, and BIOL 443
 - 2.75 CHEM units: CHEM 120, CHEM 120L, CHEM 123, CHEM 123L, CHEM 266, CHEM 266L, and CHEM 237
 - 0.5 BIOL or CHEM elective unit chosen from: BIOL 345, BIOL 431, BIOL 434, BIOL 441, BIOL 442, BIOL 444, BIOL 483, CHEM 333, or CHEM 432
 - 10.5 AFM units: AFM 101, AFM 102, AFM 212, AFM 231, AFM 273, AFM 274, AFM 291, AFM 311, AFM 341, AFM 351, AFM 362, AFM 363, AFM 373, AFM 391, AFM 401, AFM 433, AFM 462, AFM 479, AFM 481, AFM 482, and AFM 491
 - 0.5 AFM unit chosen from: AFM 205, AFM 206, AFM 207, and AFM 208
 - 1.5 ECON units: ECON 101, ECON 102, and ECON 221
 - 0.5 SCBUS unit: SCBUS 225
 - 0.5 ENGL unit: ENGL 193/SPCOM 193
 - 0.5 SPCOM unit: SPCOM 111
2. Co-operative program requirements that include:
 - Four work terms: COOP 1, COOP 2, COOP 3, and COOP 4.
 - A minimum of three work-term reports: one as part of PD 11, WKRPT 200S, and WKRPT 300S.
 - Four Professional development courses: PD 1 and PD 11 and two other PD courses.
- ~~2. Co-operative education requirements that include:~~
 - ~~○ Four work terms~~
 - ~~○ Four WatPD (professional development) courses that must include PD 1, PD 11, and two PD elective courses~~
 - ~~○ Four work term reports:~~
 - ~~▪ One completed as part of PD 11~~
 - ~~▪ Three completed in required WKRPT courses: WKRPT 200S, WKRPT 300S, and WKRPT 400S~~

Notes

1. STAT 202 can substitute for ECON 221.
- ~~2. Co-op program information requirements are located in the Co-operative Education and Career Action (CECA) section of this Calendar and in the Science Faculty work term report guidelines.~~

.....

Example 5: BSc Psychology program, which only has four work-term opportunities, and which is excluded from the reduction of required work-term reports.

Additional Program Requirements:

Students in the co-op program must also complete the co-operative ~~program education~~ requirements which include:

- Four work terms: COOP 1, COOP 2, COOP 3, and COOP 4.
- Four work-term reports: one as part of PD 11, WKRPT 200S, WKRPT 300S, and WKRPT 400S.
- Four Professional development courses: PD 1 and PD 11 and two other PD courses.

- ~~A minimum of four work terms~~
- ~~Four WatPD (professional development) courses that must include PD-1, PD-11, and two PD elective courses~~
- ~~Four work term reports:~~
 - ~~One completed as part of PD-11~~
 - ~~Three completed in required WKRPT courses: WKRPT 200S, WKRPT 300S, and WKRPT 400S~~

New “Co-operative Program Requirements” Calendar page within the Faculty of Science

Co-op Designation Eligibility

In order to be eligible to receive a co-op designation on the Bachelor of Science (BSc) degree, Faculty of Science students are required to successfully complete:

- a minimum of four work terms,
- a minimum of four professional development (PD) online courses, and
- a minimum of three work-term reports (BSc Psychology students must complete four work-term reports).

With the exception of BSc Psychology and Biotechnology/Chartered Professional Accountancy students who have four work-term opportunities, students are given five work-term opportunities in which to complete these requirements throughout the normal academic/work-term sequence.

Students are expected to follow the work-term sequence specific to their academic plan from the point of entry, subject to the minimum requirements for graduation within their program. Students may not end their sequence with a work term, and must maintain a full-time load in an academic term preceding a work term.

Students not meeting requirements of their program will be transferred to another Science academic program, if possible.

Notes

1. The co-operative system of study is only open to full-time students.
2. The co-operative system of study is not open to students seeking to complete a second degree.
3. The Doctor of Pharmacy degree has different co-op work term requirements.

Work Terms

Information regarding work terms is available on the Co-operative Education website.

Students on a work term are limited to enrolment in one course (0.5 unit), unless they have written support from their employer to take two courses (1.0 unit). COOP, PD, and WKRPT courses are not included in these limits.

Co-op Study/Work Sequences

Key	Description
F,W,S	Terms: F=September-December; W=January-April; S=May-August
1,2,3,4 plus A or B	Denotes academic year and term.
WT	Work term

Plan	Year 1			Year 2			Year 3			Year 4			Year 5		
	F	W	S	F	W	S	F	W	S	F	W	S	F	W	S

Biochemistry, Biology, Biotechnology/Economics, Chemistry, Earth Sciences, Environmental Science, Medicinal Chemistry, Science and Business	1 A	1 B	of f	2 A	W T	2B	W T	3A	W T	3B	W T	W T	4 A	4 B	
Biotechnology/Chartered Professional Accountancy	1 A	1 B	of f	2 A	W T	2B	3A	W T	3B	W T	4A	W T	4 B		
Materials and Nanosciences	1 A	1 B	of f	2 A	W T	2B	W T	3A	W T	W T	3B	W T	4 A	4 B	
Pharmacy (Doctor of Pharmacy)		1 A	1 B	2 A	W T	2B	W T	3A	W T	3B	4A	4B			
Physics, Mathematical Physics, Life Physics, Physics and Astronomy	1 A	1 B	of f	2 A	W T	2B	W T	W T	3A	W T	3B	W T	4 A	4 B	
Psychology	1 A	1 B	of f	2 A	2B	W T	3A	W T	3B	W T	4A	W T	4 B		

Notes:

1. Admission to Psychology Co-op occurs by January for the 2B term.
2. A Master of Accounting (MACc) eight-month graduate program is normally taken in consecutive winter and spring terms immediately following the completion of the 4B term in Biotechnology/Chartered Professional Accountancy.

Professional Development (PD) Courses

Students are required to successfully complete four PD courses. Each PD course is worth 0.5 unit and may not be substituted for regular academic course credit. With the exception of PD 1, students are expected to take the courses while on their co-op work terms. The schedule for completing the PD courses is as follows:

- **PD 1:** Career Fundamentals, must be taken before the first work term. Students who do not successfully complete PD 1 before their first work term must successfully complete PD 1 before their second work term. Students who do not successfully complete PD 1 by the start of their second work term will be removed from the co-op program.
- **PD 11:** Processes for Technical Report Writing, must be taken during the first work term. Students who do not successfully complete PD 11 by the end of their first work term must successfully complete PD 11 by the end of their second work term. Students who do not successfully complete PD 11 by the end of their second work term will be removed from the co-op program.
- Two additional PD courses of the student's choice must be completed during subsequent work terms.

Further information is available through the [Professional Development Program](#) website.

Work-Term Reports

Students must successfully complete a minimum of three work-term reports (BSc Psychology students

must successfully complete four work-term reports). PD 11, which is meant to help prepare students for the completion of subsequent work-term reports, will count as the first required report. Work-term reports two and three will be recorded on the transcript as WKRPT 200S and WKRPT 300S (For BSc Psychology students, work term report four will be recorded as WKRPT 400S).

Work-term reports are normally completed according to the following schedule:

- Work-term report two is normally completed by the end of the second work term and must be completed by the end of the third work term. Students who do not successfully complete their second work-term report by the end of their third work term will be removed from the co-op program.
- Work-term report three is normally completed by the end of the fourth work term but may be completed at the end of the fifth work term.
- BSc Psychology students must submit a work-term report for each work term.

Information regarding work-report guidelines and submission dates is available through the Faculty of Sciences' work-report guidelines website.

Co-op Standing Rules

Students will be removed from their co-op program in the following situations:

- Two unemployed or failed work-term opportunities
- Three missing or failed PD courses
- Two failed work-term reports (including PD 11)
- Failure to successfully meet academic program requirements
- Failure to successfully complete PD 1 before the start of the second work term
- Failure to successfully complete PD 11 by the end of the second work term
- Failure to successfully complete the second work-term report by the end of the third work term

Background: This new “Co-operative Program Requirements” page, replaces the inactive “Co-operative Program Evaluation” page, currently found under the “Degree Requirements” page, which is under the “Information and Regulations” page of the Science section of the Calendar. The new page is pulled out of the “Degree Requirements” page as a standalone page under “Information and Regulations.”

The new co-op requirements page summarizes all the co-op requirements necessary for a co-op designation, and it further broken down into sections which discuss work terms, Professional Development courses (PD), and work-term reports; Notes are added to indicate that co-op is only for full time study students, not for students seeking a second degree, and, that Pharmacy has its own requirements; reference to requirements for a full-time academic term proceeding a co-op term is kept, but reference to there being a maximum of two upper year terms where reduced or part-time studies requires department permission, is removed; and, a summary of situations that would remove a student from a co-op program, is provided.

The section on work terms contains a co-op study/work sequence chart, removed from the CECA section of the calendar. It highlights that 0.5 unit of course enrolment allowed, and that 1.0 unit total of course enrolment is possible with employer permission.

The section on PD courses outlines the PD course schedule, no longer referring to it as milestones. Reference to students being placed on probation for missed milestones is removed. Instead, the acceptable maximum completion time for each PD course, before a student would be removed from a co-op program, is stated. PD 11 must be completed before the end of second work term at maximum, and PD 1 must be completed before the start of second work term, or the student is removed from co-op.

The section on work-term reports highlights a new requirement for three versus four work-term reports, with the exception of BSc Psychology students, who are still required to submit four reports. Work-term

report due dates are noted, as well as the WKRPT course number which will represent each on the student transcript.

Faculty of Science Term Unit Load

3. **Motion:** To approve the proposed revisions to the term unit load limits as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Term Unit Load

~~Sixth and Seventh Course Enrolment~~

Three-Year General BSc Plan

~~The maximum allowable per term lecture enrolment is 2.5 lecture units (5 courses).~~
A maximum enrolment of 2.5 units is allowed per term.

Honours BSc Plans

The normal allowable per term course load is five lecture courses and their associated labs. Enrolment will be capped at 3.25 units per term unless it occurs as part of the published course sequence of a Science plan.

Students are advised not to enrol in six lecture courses per term and normally will be required to drop one course unless their cumulative overall average is above 80%.

Students wishing to exceed 3.25 units by enrolling in:

- any combination of lectures and labs, involving less than seven lecture courses will:
 - submit a unit load override request to their academic advisor for consideration, within the course selection period.
- seven lecture courses will:
 - normally have a 90% cumulative average.
 - submit [a petition](#) for consideration by the Science Petitions Committee. ~~The petition must be delivered to the Science Undergraduate Office and include the 70A petition form, supporting rationale or documentation, as well as comments from their academic advisor. Petitions must be submitted at least one month before the start of the term (April 1 for spring, August 1 for fall, and December 1 for winter).~~

Rationale: This page specifically outlines allowable term unit load limits, and provides instruction for students wishing to exceed these units. The new title better fits the page content. Reference to equate total lecture units to the number of courses is removed, as is the process involved in petitioning for seventh course enrolment.

Faculty of Science Course Grades and Credits

4. **Motion:** To approve the proposed revisions to the regulations re: course grades and credits as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Course Grades and Credits

Rules for Faculty of Science Courses

1. The Faculty constitutes the examining body for all courses. After the results have been considered they will be posted by the Registrar on Quest. Course attributes, definitions, and grades currently can be found in the [Glossary of Terms](#).
2. ~~In the Faculty of Science, course and unit have the following interpretations:~~
 - ~~**Course**—a unit of study relating to a specific academic discipline and identified by a subject abbreviation and a number (e.g., BIOL 130). A course that has the letter L following the course number is a laboratory course (e.g., BIOL 130L). Course duration is normally one term.~~
 - ~~**Unit**—the credit value associated with a course as designated in the course description. Unit weights are used in the calculation of averages for academic standing. Courses are given unit weights that vary from 0.00 to 3.00, with most being 0.5.~~
3. ~~Grades in individual courses will normally be reported as numerical grades on the scale 0 to 100. When appropriate, a non-numeric grade will be assigned by the instructor or associate dean (refer to the [Grades](#) section of this Calendar).~~
2. A non-numeric [grade](#) will be assigned to a numerically graded course in some circumstances. See [Glossary of Terms](#).
3. To obtain credit for a course, students must normally obtain a minimum grade of 50. The minimum grade is higher than 50 in certain courses (e.g., OPTOM and PHARM courses). ~~Course instructors are responsible for indicating clearly the grading practices in their courses, and students have a responsibility to understand the criteria used in determining final grades for a course. Some courses have a passing grade of 50 but a higher grade is required to meet the [requisites for a subsequent course](#).~~
4. Students who do not complete a portion of a course for health or other documented circumstances should consult their course outline, review Faculty information and instructions regarding accommodations, and refer to the [Assignments, Tests, and Final Exams](#).

Rationale: The new title better fits the page content and will make it easier to students to figure out what the page will discuss; course attributes, definitions and grades are already covered on the Glossary of Terms page, therefore, duplicated text is removed and reference to the Glossary of Terms is made; text regarding syllabi indicating passing grades and student responsibility for understanding final grade criteria, is removed; and, text is added to indicate that some courses require a higher than passing grade to advance to a subsequent course. The changes are all editorial in nature and do not required Senate approval with the exception of point #3.

Faculty of Science

Upgrading of a Bachelor of Science Degree

5. **Motion:** To approve the proposed revisions to the regulations re: upgrading a bachelor of science degree as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Upgrading of a Bachelor of Science Degree

University of Waterloo graduates who earn a Bachelor of Science (BSc) degree in General Science with 60.0% minimum Science and overall averages are eligible to apply to upgrade their degree to BSc in

Honours Science. A petition and academic advice will be required for an upgrade to any other BSc in Science.

Minors attached to the General Science degree are not transferable. Students considering a future upgrade should consider refraining from adding a minor to their General Science degree, so that it can be awarded with the Honours Science degree. will be reviewed for transferability. Students completing the upgrade are required to return their General Science diploma.

A student with a BSc degree from the University of Waterloo or any other degree granting institution may not be admitted to a BSc degree plan.

Rationale: Minors are not transferrable from a General Science to an Honours Science degree upgrade, and, students are not asked to return their General Science diploma, thus guiding text is added and text regarding the return is removed. Updated text for the 2016-2017 Calendar was misleading, implying that it might be possible to transfer minors to an update Honours Science degree.

Faculty of Science Repeating and Counting of Courses

6. **Motion:** To approve the proposed revisions to the regulations re: repeating and counting courses as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Repeating and Counting of Courses

Repeating of Courses

When courses are taken twice but passed once, both grades are included in average calculations regardless of whether the failure occurred on the first or subsequent second registration attempt. In such cases, both a credit and a failure are recorded. In instances where a ~~successfully completed~~ passed course is repeated, and passed again, it the second instance will not receive credit and will not count in the average.

~~Third attempts in previously failed courses, or their equivalent, are allowed in some plans in Science but not all. Where it is not allowed, the information is outlined in the [Science Academic Programs and Plans](#) section of this Calendar. Students uncertain of the rules for their program/plan should contact an [academic advisor](#) before starting a third attempt. Fourth attempts are not allowed.~~

Only some Science plans allow third attempts in previously failed courses. Those that do not allow a third attempt indicate this in their [academic plan](#). Fourth attempts are not permitted.

University rules govern how many times a course can be counted across multiple plans. Students uncertain of the counting or repeating rules for their program/plan combination should contact an academic advisor.

Rationale: A slight rewording is made to help clarify rules related to the repeating of courses. As well, the title of the page is updated so that this page can be used to link to the central Calendar rules regarding counting courses since the Science specific page for double counting is obsolete. The first sentence of the third paragraph will be linked to the new Counting Courses page in the central Calendar.

Registrar's Office
50% Rule

7. **Motion:** To align faculty rules related to the minimum number of courses with numeric grades being counted towards an average for a given credential (i.e., academic plan or program) by creating harmonized text and removing related faculty-specific text, effective 1 September 2020.

Rationale: The faculties of Engineering and Mathematics did not have this rule previously, but they are in agreement to add it now. This rule will be implemented as of September 1, 2020, for all undergraduate students.

New Calendar text:

Section of Calendar: University Policies, Guidelines, and Academic Regulations

Page title: 50% Rule

At least 50% of the academic course units required to be awarded a degree, major, minor, option, or specialization must have numeric grades that are included in its average(s).

Current (2019-2020 Undergraduate Calendar) faculty-specific text to be removed as follows:

AHS: <http://ugradcalendar.uwaterloo.ca/page/AHS-Grades-and-Academic-Standing>

Numeric Grading Requirement

Numeric grading is required for at least 50% of the academic course units in a Faculty of Applied Health Sciences' major, minor, option, and specialization, and those course units must be included in the overall average.

Arts: <http://ugradcalendar.uwaterloo.ca/page/ARTS-Admission-Transfer-Credit>

Calculation of Plan Average(s)

Courses used to fulfil the Residency Requirement must be graded on a numerical basis (and have received a passing grade), be in the average, and include:

- at least half the total number of academic course units required for each degree, major, minor, or diploma;
- at least 6.5 academic course units (13 courses) in Arts subjects for a Four-Year Liberal Studies degree;
- at least four academic course units (eight courses) in Arts subjects for a Three-Year Liberal Studies degree.

Environment: <http://ugradcalendar.uwaterloo.ca/page/ENV-Internal-and-External-Transfer-Credits>

Minimum Course Requirement for Calculation of Plan Averages

Transfer credits, whether internal or external, are not used in plan cumulative major and overall average calculations. Each academic plan requires a minimum number of courses which must be included in the calculation of the cumulative overall and major averages:

- Bachelor of Environmental Studies Honours: 10.0 units, of which 5.0 units must qualify for inclusion in the calculation of the cumulative major average.
- Bachelor of Knowledge Integration: 10.5 units, of which 5.5 units must qualify for inclusion in the calculation of the cumulative major average.
- Bachelor of Environmental Studies Three-Year General: 7.5 units, of which 3.0 units must qualify for inclusion in the calculation of the cumulative major average.

These requirements may affect the total number of transfer credits assigned.

Students are advised to refer to their academic plan sections in this Calendar, or contact their academic advisors, for degree and cumulative major and overall average requirements for their plan or intended

plan.

Notes

1. The School of Planning may grant a maximum of 5.0 units at time of admission from an external accredited post-secondary institution.
2. Geography and Aviation maximum transfer credit allowance includes flight training requirements.

Science (Psychology): <http://ugradcalendar.uwaterloo.ca/page/SCI-Honours-Psychology-BSc-Regular-andCoop1>

Note #12: Transfer students should note the transfer credit maximums listed on the Faculty of Science Admission page, and at least half of the PSYCH courses must be taken at the University of Waterloo with a numeric grade.

FOR INFORMATION

Final Assessment Report – Math/Business, Math/CPA, Math/FARM. Council's reviewers commented favorably on the report and responsiveness to questions and changes. Following discussion, Council approved the final assessment report on behalf of Senate. See Attachment #1.

Final Assessment Report – Mathematics Studies. Council's reviewers commented favorably on the report and responsiveness to questions and changes. Following discussion, Council approved the final assessment report on behalf of Senate. See Attachment #2.

Final Assessment Report – General and Honours Science. Council's reviewers commented favorably on the report and responsiveness to questions and changes. There was discussion regarding perceptions of general programs, as documented in the report, and avenues to explore. Following discussion, Council approved the final assessment report on behalf of Senate. See Attachment #3.

2-Year Report – Statistics and Actuarial Science. Council's reviewer commented favorably on the report and progress made, particular given the significance of some of the recommendations. Following discussion, Council approved the 2-Year report on behalf of Senate. See Attachment #4.

MINOR PLAN & CURRICULAR MODIFICATIONS

Council approved the following on behalf of Senate:

- minor plan changes for the faculties of applied health sciences (human nutrition minor, ergonomics and injury prevention minor, medical physiology minor, honours bachelor of public health, honours bachelor of science, health studies, gerontology minor, aging studies option); science (honours physics (reg and co-op), honours physics and astronomy (reg and co-op), honours biochemistry (reg and co-op), honours chemistry (reg and co-op), honours chemistry, computational specialization (reg and co-op), honours chemistry biobased chemistry, honours co-operative medicinal chemistry, honours geochemistry (reg and co-op), optometry, chemistry minor, earth sciences minor).
- new courses for the faculties of applied health sciences (school of public health and health systems, kinesiology); science (biology, physics); co-operative education council (PD course for engineering).
- course changes for the faculties of applied health sciences (school of public health and health systems, kinesiology); arts (sociology and legal studies); science (biology, chemistry, earth sciences, materials and nanosciences, physics).
- course inactivations for the faculty of science (chemistry, physics, science).

/rmw

David DeVidi
Associate Vice-President, Academic

Handling of Final Assessment Reports & Two-Year Progress Reports related to academic program reviews

Introduction

Waterloo's Senate Undergraduate Council (SUC) and Senate Graduate and Research Council (SGRC) have a duty to consider all aspects relating to the academic quality of undergraduate studies and graduate studies within the University. As described in Waterloo's Institutional Quality Assurance Process ([IQAP](#)), documentation emerging from the [cyclical program review](#) process includes:

- [Final Assessment Report](#), which summarizes the self-study, external reviewers' report, program response, and implementation plan, and
- [Two-Year Progress Report](#), which reports on progress related to the implementation plan.

Final Assessment Reports (FARs), require two SUC or SGRC members to review the report, whereas, Two-Year Progress Reports only require one SUC or SGRC member, although at the SUC/SGRC Chair's discretion, a second reviewer may be sought. In order to ensure that student representatives have the opportunity to review each report, the FEDS VP, Academic and GSA, President receive these documents in advance for information. Any questions or concerns they might have can be raised and addressed, if needed, prior to the report being approved at SUC/SGRC. This review process is coordinated by the Quality Assurance (QA) Office.

To promote transparency and foster integrity in the review process, reviewers should not be members of the Faculty or Affiliated and Federated Institutions of Waterloo (AFIW) from which the report originates.

Assessment

Reviewers will consider a series of **guiding questions** (see below) in arriving at their recommendation for revision or approval to SUC or SGRC. Before reporting to SUC or SGRC, reviewers will ask questions and share their observations, as well as any concerns they have identified with the report, to the Quality Assurance Office, who will then connect with the Chair or Director of the program. The FEDS and GSA representative will also receive these reports for information prior to submission to SUC/SGRC.

The Quality Assurance Office will ensure that any revisions to the reports are completed by the Chair or Director of the program, prior to the QA Office submitting the report for approval at a SUC or SGRC.

Does the Final Assessment Report:

- 1) Include a credible implementation plan that not only addresses the substantive issues identified from the program review process but also identifies clearly:
 - What actions will follow from specific recommendations?
 - Who will be responsible for acting on those recommendations?
 - Who will be responsible for providing resources?
 - Priorities for implementation and realistic timelines for initiating and monitoring actions?
- 2) Provide a rationale as to why a recommendation(s) will not be pursued?

Does the Two-Year Progress Report:

- 1) Clearly describe progress achieved on the various action items in the implementation plan?
- 2) Explain convincingly any circumstances that would have altered the original implementation plan?
- 3) For items that are behind schedule, propose an amended implementation schedule that is reasonable and credible?
- 4) Address significant developments or initiatives that have arisen since the program review process, or that were not contemplated by the program review process?

The program Chair or Director (or their chosen delegate) will attend the SUC or SGRC meeting to address any questions or concerns that might arise during SUC/SGRC.

SUC's and SGRC's responsibility will be to focus on the overall credibility and feasibility of the report and the proposed plan of action – seeking to uncover, for example, unexplained disjunctions between the reviewers' recommendations and the program's response – as opposed to the minutiae of course content and curriculum structure.

A Final Assessment Report or Two-Year Progress Report that is approved by a majority vote of SUC/SGRC will be submitted to Senate for information. Should the discussion at SUC or SGRC reveal issues of concern that require revision, the Quality Assurance Office will work with the program Chair or Director to address the concern(s). If minor revisions are needed, the report will be edited and then it will proceed to Senate for information without re-approval from SUC/SGRC; however, any major revisions will require SUC/SGRC review and approval.

Status of Reports under Review

A summary of the status of all reports under review, including reports for which the QA Office is seeking reviewers, can be found at the following link:

<https://uwaterloo.ca/academic-program-reviews/status-reports-under-review>



Final Assessment Report

Mathematics/Business Administration, Mathematics/Chartered Professional Accountancy, Mathematics/Financial Analysis and Risk Management (BMath)

May 2019

Summary of the Program Review:

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the Bachelor of Mathematics in Mathematics/Business Administration, Mathematics/Chartered Professional Accountancy (CPA), and Mathematics/Financial Analysis and Risk Management (FARM) delivered by the Faculty of Mathematics. Together, these programs are commonly referred to as Math Business and Accounting Programs (MBAP). A self-study (Volume I) for the programs was submitted to the Associate Vice-President, Academic on July 1, 2016. This self-study presented the program descriptions and learning outcomes, an analytical assessment of the programs, including the standard data package prepared by the Office of Institutional Analysis & Planning (IAP). The CVs for full-time faculty members associated with each program were included in Volume II of the self-study.

Two arm's-length external reviewers were selected from Volume III of the self-study. Dr. Mohammad Ahsanullah, Professor of Information Systems and Supply Chain Management, Rider University, and Dr. Mahmoud Zarepour, Professor of Mathematics and Statistics, University of Ottawa were ranked and selected by the selected by the Associate Vice-President, Academic, as well as, one internal reviewer, Dr. Anna Esselment, an Associate Professor in Political Science.

Reviewers appraised the self-study documentation and conducted a site visit to the University on December 1st and 2nd, 2016. The visit included interviews with the Associate Vice-President, Academic; Dean of Mathematics; Associate Dean of Mathematics; Chairs and Directors of the Departments supporting the programs being reviewed; faculty members; staff, and meetings with a group of current undergraduate students. The reviewers also met with a representative from the library, and Co-operative Education.

This final assessment report is based on information extracted, in many cases verbatim, from the self-study, the external reviewers' report and the program response.



Program characteristics:

Bachelor of Mathematics in Business Administration (BMath)

The Math/Business Administration program is offered by the Faculty of Mathematics, in co-operation with various academic units from other faculties at the University of Waterloo (Waterloo) and the School of Business and Economics at Wilfrid Laurier University (Laurier). This program provides an opportunity to combine courses in actuarial science, computer science, optimization, and statistics with courses in accounting, business, economics, human resource management, and management sciences. Graduates are well prepared to use sophisticated analytical techniques in the solution of business-related problems and adapt to the rapidly changing modern business environment.

Bachelor of Mathematics in Chartered Professional Accountancy (CPA)

The Math/CPA program is offered by the Faculty of Mathematics, in co-operation with the School of Accounting and Finance. This program combines mathematics with accounting and business-related disciplines while giving students the opportunity to gain up to 16 months of CPA-approved work-experience through co-op work terms.

The Honours Mathematics/CPA plan provides an opportunity for studies in areas of mathematics including actuarial science, computer science, optimization, and statistics combined with an extensive professionally oriented sequence of accounting courses. Graduates are well prepared to play a leading role in the increasingly important development and utilization of computer-based accounting information systems, the analysis of the information provided by such systems and the subsequent decision-making processes, and allocation of resources so crucial to an organization's success in the modern business world.

Bachelor of Mathematics in Financial Analysis and Risk Management (FARM)

The Math/FARM program offered by the Faculty of Mathematics, with required business courses being taught by professors in the School of Business and Economics at Wilfrid Laurier University. It is designed for students who are interested in working in finance, banking, insurance, or industrial firms in financial analysis or risk management. The two specializations available, Chartered Financial Analyst (CFA) and Professional Risk Management (PRM), provide excellent preparation for the required professional examinations necessary for those designations.



Summary of strengths, challenges and weaknesses based on self-study:

Bachelor of Mathematics in Business Administration (BMath)

Strengths

- Program Success: The program has a long history with many successful graduates. It continues to be in high demand, drawing a consistent number of high quality applicants from around the world.
- Uniqueness of Employability: The combination of math and business is a program that is unique to Waterloo, from a North American perspective. The program is well received by employers, with high co-op placement and employment rates; it provides great flexibility for students' job applicability, with employment capacity in all areas of business (finance, marketing, HR, IT, etc.).

Challenges

- Perception: There is a perception that the program is for academically challenged students; it is seen as second-tier behind other programs offered by the Faculty of Mathematics.

Weaknesses

- Community: There are no social programs nor a student association for students enrolled in the program.

Bachelor of Mathematics in Chartered Professional Accountancy (CPA)

Strengths

- Employability: Students gain up to 16 months of quality work experience and are provided a direct pathway to CPA designation, resulting in a mathematical and quantitative background that is highly desired by employers.
- Quality of Students: Math/CPA has the reputation of an elite program, and continues to attract a large number of exceptional students. It has one of the most competitive admission processes at Waterloo, requiring high school averages in the low- to mid-90's.

Challenges

- Continuous Improvement: Ensuring that Math/CPA continues to meet the evolving goals, objectives, and standards of the Faculty of Mathematics, the School of Accounting and Finance and the accreditation authority, CPA Canada.
- Communication: Maintaining constant open communication and co-operation between SAF and the Faculty of Mathematics to ensure consistency of CPA-related information, content, and opportunities provided to students in the AFM and Math/CPA programs.



Weaknesses

- **Rigidity:** The high number of required courses allows for no unrestricted electives and little flexibility in students' schedules. Students may pursue most Faculty of Mathematics minors, but are not able to pursue minors or additional plans outside the Faculty without taking extra courses and/or additional academic terms.

Bachelor of Mathematics in Financial Analysis and Risk Management (FARM)

Strengths

- **Community:** Many students in the program are passionate about and are strong advocates for the program, since many are generally interested in a career in the field. Student clubs are well attended and supported by the student body. There is a strong connection between the faculty and the FARM Student Association (FARMSA); the Program Director is the sponsor for the club and regularly consults with the club's executive.
- **Co-operative Education:** There is a high proportion of students in the co-op program who are considered to be excellent or outstanding by their co-op employers, a figure that continues to increase since the program's inception.

Challenges

- **Perception:** The program has been almost too successful in building buzz amongst parents and influencers in the lives of applicants, such that many students apply without an interest in the subject matter. The pressure to make money supersedes the student's need to have a personally fulfilling career.

Summary of key findings from the external reviewers:

In general, these programs are distinctive in the sense that students graduate with a degree in Mathematics, but have also taken a heavy load of business courses. Students who graduate from this program appear to be well equipped to pursue employment in their field. It is therefore clear that these programs are not only well known to employers but also prepare their graduates through a rigorous and unique curriculum.



Program response to external reviewer recommendations:

Recommendations

1. It is highly recommended that the Faculty takes the matter pertaining to the Mathematics and Business administration programs into serious consideration. The Faculty must pursue formalizing the unit in some fashion. This could best be achieved by transforming it into its own academic unit or department, or perhaps as a division of another department. Considering the uniqueness of these multidisciplinary programs, the Department of Mathematics and Business Administration could have an integrated complement of faculty members, some of whom would be dedicated to teaching (or teaching tenure track stream) and others who would both teach and research in the field of math and business. Hiring research-based professors (even as cross-appointed faculty) would elevate the stature of the program within the Faculty, but would also open opportunities to introduce graduate-level programs. The cross-appointed faculty will also link the unit with research faculty members and magnify the role this unit plays in the Faculty.

Response

The prior undergraduate review also mentioned about an academic home of MBAP and recommended considering that it be placed under the auspices of an academic department. This hasn't taken place largely because the size of present MBAP makes this move problematic. It is larger than any department in the Faculty. Furthermore, Math Business and Accounting Programs (MBAP) currently doesn't have the research-oriented basis for it to be considered an academic department.

In order to provide the necessary structure for the Math Business group to effectively fulfill its mandate, the creation of a division for Mathematics in Business and Finance will be considered. To involve associated research faculty members, an initial phase could follow the model taken with the Centre for Computational Mathematics in Industry and Commerce. The best idea would be to develop a core group of associated faculty joint or cross appointments from Pure Mathematics, Applied Mathematics, Combinatorics and Optimization, Computer Science as well as Statistics and Actuarial Science that would build some strength in the research area and would enable MBAP to offer graduate programs further raising its already high profile.

There has been ongoing discussions about the future of Math Business. There are currently four possible directions proposed. Active consultation is taking place between the Dean, the senior administration within the Math Faculty, as well as faculty and staff in the current Math Business program. It is unclear at this time which proposal will be the direction the faculty takes, or the timeline involved.



2. If the Mathematics Business unit was more formalized, the opportunity to transform the definite-lecturer/continuing lecturer role into teaching tenure track appointments would present itself. This would provide employment security to those members of the Mathematics and Business programs, but in keeping with their primary roles as teaching faculty. This would also place more emphasis on the expectation that excellence in teaching is highly valued in the program.

Response

Most MBAP faculty members hold definite-term contracts. The MBAP program recognizes the value of these lecturers. Any changes to the employment status of these lecturers is governed and restricted by [Policies 76](#) and [77](#). Currently there is a university level policy review committee looking at these two policies. It is unknown when this review committee will propose changes.

3. The Mathematics and Business Accounting programs should expand its advisory capacity within the unit, perhaps with full-time staff advisors to share the load with faculty advisors. Given that the students raised the issue of long lines to see their faculty advisor, then creating more capacity to assist students within the degree would also address some of those concerns that were brought up to our attention during the review.

Response

As a result of this program review, the program has revised and discussed our academic advising activities. A full time staff member has been hired and the program has made adjustments to improve the service we provide. The new staff member provided point of contact with students for student engagement and student success initiatives as well as with external partnerships, events, and accreditation. As a result, the FARM program (Risk Management Specialization) has been fully accredited by the Professional Risk Manager's International Association (PRMIA), and FARM current and past students are exempt from PRM Exam I and PRM Exam II, which both shortens PRM designation period and offers significant savings for those seeking that designation. He also successfully completed University of Waterloo Global Markets Simulation Program with StockTrak which offers students unique exposure to practice their classroom knowledge in real time world of finance, investment, banking, and other industries by extensively using industry standard technology.

4. Departments with courses taught within the Mathematics Business and Accounting unit must be more flexible about slight modification of course content that better suits the pedagogical requirements of the students receiving that content, and of the instructor who is delivering the material.

Response



MBAP agrees that the programs would benefit from further participation by faculty members in other Math departments. The MBAP Director and the program committee will take the lead in developing a mechanism that would appropriately manage teaching contributions to the programs to ensure that all courses are taught in a more subject-oriented setting by faculty members.

5. Where other departments are intractable about the opportunity for tailoring content within their owned courses for the Mathematics Business stream, the Mathematics and Business programs should be permitted to develop more of its own courses where pedagogical reasons are compelling.

Response

MBAP cautiously endorses this recommendation. The unit currently offers six COMM and three MATBUS courses for Mathematics Business students. Starting the Fall 2017 term, a new tax course (COMM 433) will also be offered. One very fundamental philosophy of the Math Business programs has been the need to integrate business and mathematics in the classroom. However, there are very few opportunities to create unique course versions as the departments would not support the creation of the MATBUS courses, for example, Statistics or ACTSC to teach to Math Faculty students. The discussion came about because there are many students who want to do Statistics or Actuarial Science majors as part of Math Business programs. As Statistics or Actuarial Science majors, these students should be exposed to the same courses as other students doing the majors. By doing the major, they are indicating an interest that goes beyond other Math Business students. There are also problems with substitutions that create packages of courses that are not true to either degree. It is definitely worth to discuss these courses in the near future with the eventual goal of enabling MBAP to create those courses and possibility offer above mentioned majors.

Over the next year the MBAP program committee will investigate this recommendation to determine if or how it can be implemented.

6. Where possible, the Mathematics and Business programs should identify courses that could be offered online. This could provide assistance for scheduling purposes, and it would also provide an opportunity for students on co-op to more easily take one academic course (co-op students are permitted to take one academic course per work term without Faculty permission; more than one course requires the permission of employer). The online course offerings may also help to have a conflict-free schedules in future for a possible error in scheduling. Moreover, some related financial glossaries can be considered in their communication courses which students are required to take in this unit.

Response



MBAP strongly endorses the reviewers' recommendation. The Faculty of Mathematics is currently working on the introduction of fully online degree program for Math/FARM students, which complements and advances the reviewers' recommendation. The program will look into the number of students taking online classes but in general though, online enrolments are really climbing. With respect to pedagogical efficacy, dashboards will be built that measure the relative online versus in-class performance by students. Click level data will be examined to observe actual (versus self-reported) student behaviour and will correlate that with performance. It is expected that a research group will also be bringing forward specific proposals in the not so distant future.

7. The Faculty of Mathematics should review how it markets and/or informs incoming international students about the co-op program so that all students who enter into Mathematics are fully apprised of the co-op opportunity.

Response

The MBAP Director meets regularly with the Undergraduate Recruitment and International teams of the Faculty. The Programs are strongly committed to continuing these efforts. They will work with the team to review the activities of the team and address any perceived needs. Co-operative and Experiential Education will also be contacted to identify skills that Math Business students need so that to ensure that international students are aware of them.

8. The Faculty should review how it communicates to students (especially international students) regarding the required minimum academic averages to stay in their respective programs and plans.

Response

The University of Waterloo's Undergraduate Studies Academic Calendar specifies the rules that determine a student's academic standing. A student's standing determines whether a student is able to proceed in the Faculty or in their chosen plan, how many courses they are able to take in the next term, etc. However, the Faculty of Mathematics computes several averages (CAV, TAV, MAV, SMAV) that are used to determine a student's standing within the Faculty. MBAP usually informs new students about those averages during students' orientation programs to help ensure a successful transition into university. The Programs will make sure that students (especially international) who missed orientation programs for some reason are sent the required information via their program advisors.



Implementation Plan:

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	The Faculty must pursue formalizing the unit in some fashion.	The issue is currently under discussion with the Dean, the senior administration within the Math Faculty, as well as faculty and staff in the current Math Business program.	Dean's Office, MBAP Director, Unit Heads in the Faculty of Mathematics	December 2019 –In progress
2.	Transforming the definite-lecturer/continuing lecturer role into teaching tenure track appointments.	The issue is currently under discussion with the Dean.	MPAP Director, Dean, Vice President Academic	December 2018-DONE
3.	The Mathematics Business and Accounting programs should expand its advisory capacity within the unit.	Review academic advising activities with faculty members and student representatives.	MBAP director leads the efforts, Associate Dean allocates resources	Spring/Fall 2017 -DONE
4.	Departments with courses taught within the Mathematics Business and Accounting unit must be more flexible about slight modification of course content that better suits the pedagogical requirements of the students receiving that content, and of the instructor who is delivering the material.	MBAP and program committee to follow up and create a mechanism for such modifications	MBAP Director	December 2018-DONE



5.	Where other departments are intractable about the opportunity for tailoring content within their owned courses for the Mathematics Business stream, the Mathematics and Business programs should be permitted to develop more of its own courses where pedagogical reasons are compelling.	MBAP has and continues to discuss this matter internally. The issue has been discussed with the Program Committees of STATS and ACTSC	MBAP Director, MBAP Program Committee members, SAS Chair, SAS Program Committee Chairs	2018-2019
6.	Where possible, the Mathematics and Business programs should identify courses that could be offered online.	Developing online version of courses for FARM program	Assistant Dean Online Instruction	2018/2019 –All Math core courses are available in online mode and more courses are under development
7.	The Faculty of Mathematics should review how it markets and/or informs incoming international students about the co-op program so that all students who enter into Mathematics are fully apprised of the co-op opportunity.	The issue will be discussed with Associated Dean Admissions and Outreach.	MBAP Director, Associate Dean Admissions and Outreach Undergraduate Recruitment and International Office	2018/2019
8.	The Faculty should review how it communicates to students (especially international students) regarding the required minimum academic averages to stay in their respective programs and plans.	The issue will be discussed with Associated Dean for Co-op.	MBAP Director, Associate Dean for Co-op, Co-op Office	2018/2019

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.



UNIVERSITY OF
WATERLOO

Date of next program review:

2022-2023

Date

Signatures of Approval:

A handwritten signature in black ink, appearing to be "S. Sangha".

August 02, 2018

Chair/Director

Date

AFIW Administrative Dean/Head (*For AFIW programs only*)

Date

A handwritten signature in blue ink, appearing to be "S. Sangha".

2018-08-09

Faculty Dean

Date

A handwritten signature in blue ink, appearing to be "H. Craig".

June 5, 2019

Associate Vice-President, Academic
(For undergraduate and augmented programs)

Date

Associate Vice-President, Graduate Studies and Postdoctoral Affairs
(For graduate and augmented programs)

Date



MEMORANDUM

January 8, 2019

Re: Quality Assurance (Academic Programs)

The Math Faculty endorses the Final Assessment Report for the Mathematical Students program. I have met recently with the Associate Dean Undergraduate who oversees this program and discussed in detail many of the issues in this report. I am satisfied with the proposed actions to the reviewers' recommendations.

Regards,

Stephen M. Watt
Dean, Faculty of Mathematics





Final Assessment Report

Mathematical Studies (BMath)

July 2019

Executive Summary

External reviewers found that the Mathematical Studies program (BMath) delivered by the Faculty of Mathematics was in good standing, but there were some concerns.

"The Mathematical Studies program ... successfully prepares students for careers in business, teaching, or public service. However, although the program is important to the Faculty (for student retention), it is clear that the program has been neglected by the Faculty. The program is in need of a Director who can address long-standing issues."

A total of 6 recommendations were provided by the reviewers. The majority of these recommendations were aimed at improving the perception and purpose of the program. In response, the program created a plan outlining the specific actions proposed to address each recommendation as well as a timeline for implementation. The next cyclical review for this program is scheduled for 2022-2023.

Enrollment over the past three years

	Honours	Honours Co-op
2016-17	117	66
2015-16	100	67
2014-15	59	47

Background

In accordance with the University of Waterloo's Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response of the Bachelor of Mathematics in Mathematical Studies delivered by the Faculty of Mathematics. A self-study (Volume I, II, III) was submitted to the Associate Vice-President, Academic on October 6, 2017. The self-study (Volume I) presented the program descriptions and learning outcomes, an analytical assessment of the programs, including the standard data package prepared by the Office of Institutional Analysis & Planning (IAP). Appended to Volume I were the course outlines for all courses in the program. The CVs for each faculty member with a key role in the delivery of the program was included in Volume II of the self-study.



From Volume III, two arm's-length external reviewers were selected by the Associate Vice-President, Academic: Dr. Timothy Sibbald, Associate Professor in the Schulich School of Education, Nipissing University, and Dr. Gerda de Vries, Professor in the Department of Mathematical and Statistical Sciences, University of Alberta.

Reviewers appraised the self-study documentation and conducted a site visit to the University on November 16 and 17, 2017. An internal reviewer from the University of Waterloo, Dr. Eric Helleiner, Professor of Political Science, was selected to accompany the external reviewers. The visit included interviews with the Vice-President Academic and Provost; Associate Vice-President, Academic; Dean of Mathematics; Associate Dean, Undergraduate Studies of Mathematics; Director of Mathematics Teaching, Faculty members, staff and current undergraduate students. The review team also had an opportunity to meet with representatives from the Library and Co-operative Education, and tour the facilities.

This final assessment report is based on information extracted, in many cases verbatim, from the self-study, the external reviewers' report and the program response.

Program characteristics

The Mathematical Studies (BMath) program is meant for students whose mathematical interests are broadly based. Its high degree of flexibility makes it suitable for those who wish to design a course of study that suits their individual tastes. Under this plan, there is ample scope for students to obtain a minor in an area of mathematics or a minor from another Faculty. With judicious course selections, graduates of Mathematical Studies can confidently pursue careers in business, teaching, or public service.

Summary of strengths, challenges and weaknesses based on self-study

Strengths

- Mathematical Studies is more flexible than other plan in Mathematics
- Students are prepared for successful careers in business, teaching, or public service, as well as other areas
- Helpful for retention of students who have failed more than four courses since this program allows students to fail up to 8 courses, unlike all other majors in the Faculty
- Academic advisors are an important resource and extremely supportive

Challenges

- The plan lacks a Director who has the time to take care of the plan
- There is a stigma of Mathematical Studies being the easiest plan in the Faculty and that students are "not good enough" for other plans
- The Mathematical Studies plan is viewed as a low priority by some faculty



- Forced entry into the plan can be traumatic for students
- Cohesion amongst students can be improved
- More student mental health support is needed

Weaknesses

- Students do not always have access to as wide a range of courses as they would like
- Scheduling seems to restrict the course selection further
- Co-op is effective but there are not many jobs targeted to these students
- There is a lack of functional space due to the growing university population

Summary of key findings from the external reviewers

The Mathematical Studies program is in good standing. It successfully prepares students for careers in business, teaching, or public service. However, although the program is important to the Faculty (for student retention), it is clear that the program has been neglected by the Faculty. The program is in need of a Director who can address long-standing issues. If the Faculty wishes the program to continue and thrive, changes are necessary. The necessary changes can happen only if the program has an advocate in the form of a Director with sufficient time and authority.

Program response to external reviewers' recommendations

Recommendations

1. We strongly recommend the appointment of a Director for the Mathematical Studies program. The Director needs to be someone who has the time and authority to evolve the program, solve problems (for example, to work with departments to resolve simple course scheduling conflicts or to resolve course sequencing issues), and advocate for students in the program.

Response

This plan consists of three components: 1) Mathematical Studies core, 2) a selection of ten 300- and 400-level Faculty of Mathematics courses and 3) other courses. To be successful, the Director must be able to oversee changes to the Mathematical Studies core and the creation and modification of upper-level courses offered from the school and four departments in the Faculty.

The Associate Dean Undergraduate Studies (ADUG) oversees changes to Faculty of Mathematics core requirements of academic plans and is thus the person best positioned to lead changes to the Mathematical Studies core. At present, the ADUG also assumes the position of Director of Mathematical Studies. Unfortunately, the ADUG does not interact as frequently with the Mathematical Studies students as the plan's advisors, thus the ADUG may not fully appreciate some challenges faced by students in this plan.



In the past, the ADUG has asked the units to create courses that are of interest to a non-specialist audience, and some courses have been created, but perhaps not enough.

We propose to form a Mathematical Studies Committee, which consists of the following:

- Mathematical Studies advisors (presently there are three);
- Several students in the plan;
- Assistant Dean of Students; and
- Associate Dean, Undergraduate Studies who will chair the committee

This committee will meet regularly to discuss the plan and how it can, and should, be improved.

2. The stigmatization of students in this program and the program itself needs to be addressed. We recognize that this will be a challenge since the institution promotes high-performing students while many students in the Mathematical Studies program are there because of low averages or exceeding the maximum number of failed/excluded courses for departmental programs.

Response

As will be addressed in Recommendation 3, the program will attempt to remove the plan's stigma by celebrating its graduates in a public setting. Also, the Mathematical Studies Committee will investigate how we can further remove the stigmatization of students in this plan.

Student Mental Health on campus is an important issue, as is apparent from the President's Advisory Committee on Student Mental Health (PAC-SMH) whose 2017 report includes 36 recommendations. The Faculty of Mathematics has also created a committee for Student Wellbeing, chaired by the Vice-Dean of Mathematics. Because students enrolled in other Faculty of Mathematics baccalaureate plans are forced into Mathematical Studies if they earn more than four failures, students in Mathematical Studies may need more support than what is typical across other plans.

As a result of the PAC-SMH efforts, there is going to be more support for all students on campus. In particular, Faculty of Mathematics' students will benefit from: 1) two new academic advisors who advise Mathematical Studies students and 2) a second counsellor situated in the Mathematics Undergraduate Office (MUO). Combined, these steps should help students in Mathematical Studies to obtain more counselling and academic support when needed.



3. To aid with the removal of the stigma, we recommend that the Faculty reviews its Calendar entry and promotional materials for the program to highlight the opportunities that students have to personalize this program (for example by adding the Business Specialization and/or a Minor). Celebrating successful students in the program (especially those who may have struggled at the outset) should also help.

Response

Mathematical Studies is described in current brochures distributed to students interested in doing undergraduate studies in the Faculty of Mathematics. The brochures indicate that this plan is the most flexible of all Faculty plans and gives students a broad education in mathematics. It also mentions that there is a possibility for specialization in Business. The new Mathematical Studies Committee is working on revising this text.

To celebrate successful students who have graduated from Mathematical Studies, the program hosted a Mathematical Studies Career Panel discussion November 7, 2018. To do this, several graduates from the plan were invited to talk to students currently in the plan and answer their questions about career options for the future. The Mathematical Studies Committee will consider holding this event on an annual basis.

4. The Faculty may wish to consider making the Mathematical Studies program the point of entry for all students, from which students can launch into departmental programs if they so desire.

Response

The Mathematics Undergraduate Affairs Committee (UAC) has decided to form a committee that will discuss the possibility of having all BMath students start in a plan that is either Mathematical Studies or similar to Mathematical Studies. The plan is to discuss the various pros and cons of making this change based on how it would impact the Faculty. The committee first met in November 2018. At UAC, there was support for this idea but there were also some concerns. In particular, would an unintended/undesirable message be sent to students, if we accept students into a program that allows for a greater number of fails than all other Faculty programs? The next step is to discuss the logistics of this change with the Registrar's Office.

It is recognized that if direct entry into Mathematical Studies were available, it would perhaps remove some of the stigmatization that is currently associated with this plan. However, there are some concerns that need to be discussed by the Faculty before a decision can be made. It is not clear that this change will remove the trauma of students who fail out of another academic plan, or that it sends the right message to incoming students.



5. It will be a worthwhile endeavor for the Faculty to review the prerequisite structure of its courses. Are there unintended or outdated barriers to certain courses that can be removed? Perhaps some courses can have multiple entry points (for example, either a specific specialist course or a certain combination of non-specialist courses). Alternatively, a prerequisite waiver system (whereby students gain permission to take a certain course upon approval by the instructor and program Director) might address issues surrounding course sequencing.

Response

One advantage of the Mathematical Studies plan is that it allows students to take some non-specialist courses in their core, if they are not able to successfully complete the specialist version. As previously mentioned, this degree of flexibility early on has the disadvantage that it restricts the options of the subsequent courses the students can take.

UAC is the body that deals with changes to courses in general, and prerequisites in particular. Each academic unit understands their courses the best and brings suggested changes to the Committee, so that they can be discussed Faculty-wide. This committee works continuously to update and improve the courses and programs offered by the Faculty. UAC is very effective in evolving the curriculum but it is recognized that there may be less interest given to the non-specialist courses. The proposed Mathematical Studies Committee mentioned above is the first committee that will discuss these limitations and how they might be overcome with consultation with the different units.

6. We recommend that the Faculty invests in getting to know the students in the Mathematical Studies program, and evolve its curriculum accordingly. How did the students arrive in the program? What needs do the different constituencies have? We expect that the needs of students who purposely choose the program for its flexibility are different than the needs of students who are forced into the program due to low averages or exceeding the maximum number of failed/excluded courses for departmental programs. Likewise, the needs of students in the program who started in the Faculty may be different than the needs of students who transferred from another Faculty. For students who were forced into the program, are there support systems that can and should be put in place to help them adjust and succeed?

Response

The academic advisors for Mathematical Studies are the ones who have the most contact with these students and know the students the best. Unfortunately, to date, there has not been a discussion with these advisors about the Mathematical Studies students and this is something that we will change.



The proposed Mathematical Studies Committee will create a means through which the advisors and the students can more easily voice their concerns about Mathematical Studies and important issues going on with these students. This would be a valuable opportunity to learn about the two different study streams of Mathematical Studies and how student needs might differ.

The Mathematical Studies program has started working with the Student Success Office (SSO) to track students throughout their undergraduate career. Part of this is to better understand what factors have helped to contribute to their success but also to learn what we can do differently to better support our students. The Faculty of Mathematics plans on profiling the Mathematical Studies students to see what can be done differently to make their undergraduate education more successful.



Implementation Plan

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	We strongly recommend the appointment of a Director for the Mathematical Studies (MS) plan.	<p>Form a Mathematical Studies Committee that will meet periodically to discuss what needs to be done to maintain and improve the plan. This committee will consist of the following:</p> <ul style="list-style-type: none"> • MS advisors (presently there are three) • Several students in the plan • Assistant Dean of Students • ADUG (chair) 	ADUG	Committee formed November 2018 (Completed)
2.	The stigmatization of students in this plan and the plan itself needs to be addressed.	<ol style="list-style-type: none"> 1. Remove the stigma that appears to exist in MS by celebrating the success stories of previous graduates. See recommendation 3. 2. The MS committee will investigate this issue in more detail. 3. Give more support to students who are not able to stay in the plan of their choice. In the last year we have hired two new 	ADUG and MS Committee	<p>MS Career Panel November 7 2018 (Completed)</p> <p>MS Committee to discuss (Ongoing)</p> <p>Two advisors and counsellor arrived 2018 (Completed)</p>



		academic advisors and a second counsellor in the MUO.		
3.	To aid with the removal of the stigma, we recommend that the Faculty reviews its calendar entry and promotional materials for the plan to highlight the opportunities that students have to personalize this plan.	<p>Recruitment brochures already advertise the flexibility in the Mathematical Studies plan but the text has recently been updated.</p> <p>Organized a Mathematical Studies Career Panel where alumni shared their experiences and answered questions of the current students.</p>	MS Committee	<p>June 2020</p> <p>November 7, 2018 (Completed)</p>
4.	The Faculty may wish to consider making the Mathematical Studies plan the point of entry for all students, from which students can launch into departmental plans if they so desire.	UAC will discuss the advantages and disadvantages of having direct entry of all Math students into Mathematical Studies.	Mathematics UAC	July 2020
5.	It will be a worthwhile endeavour for the Faculty to review the prerequisite structure of its courses. Are there unintended or outdated barriers to certain courses that can be removed? Perhaps some courses can have multiple entry points (for example, either a specific specialist course or a certain combination of non-specialist courses). Alternatively, a	The new Mathematical Studies Committee will discuss this with the different units to see whether the prerequisites for the courses can be changed.	MS committee	Ongoing



	prerequisite waiver system (whereby students gain permission to take a certain course upon approval by the instructor and plan Director) might address issues surrounding course sequencing.			
6.	We recommend that the Faculty invests in getting to know the students in the Mathematical Studies plan, and evolve its curriculum accordingly. How did the students arrive in the plan? What needs do the different constituencies have? We expect that the needs of students who purposely choose the plan for its flexibility are different than the needs of students who are forced into the plan due to low averages or exceeding the maximum number of failed/excluded courses in departmental plans. Likewise, the needs of students in the plan who started the Faculty may be different than the needs of students who transferred from another Faculty. For students who were forced into the plan, are there support systems that can and should be put in place to help them adjust and succeed?	<p>The Mathematical Studies Committee consists of the academic advisors of the plan as well as students. This will create dialogue whereby the needs of the students can be heard.</p> <p>The SSO will look at the distribution of students in this plan to better understand how students end up in the plan and what factors most contribute to their success.</p>	<p>ADUG</p> <p>SSO</p>	<p>Ongoing – Estimate to complete July 2021</p> <p>July 2020</p>

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.



UNIVERSITY OF
WATERLOO

Date of next program review

2022-2023

Date

Signatures of Approval

A handwritten signature in blue ink, appearing to read "James Bell".

Dec 18, 2018

Chair/Director

Date

AFIW Administrative Dean/Head (*For AFIW programs only*)

Date

A handwritten signature in blue ink, appearing to be a stylized "S" followed by a flourish.

2019-01-09

Faculty Dean

Date

Note: AFIW programs fall under the Faculty of ARTS; however, the Dean does not have fiscal control nor authority over staffing and administration of the program.

A handwritten signature in blue ink, appearing to read "Hans Craig".

July 11, 2019

Associate Vice-President, Academic
(For undergraduate and augmented programs)

Date

Associate Vice-President, Graduate Studies and Postdoctoral Affairs
(For graduate and augmented programs)

Date



June 5, 2018

To: Quality Assurance Office

The Faculty of Mathematics endorses the May 2018, Two-Year Progress Report, Bachelor of Mathematics in Statistics, Statistics for Health, Actuarial Science, or Mathematics Finance (BMath).

Significant progress has been made to implement the recommendations of the reviewers, with many of the recommendations currently in progress or completed.

In particular, the department has -


- Changed Statistics for Health into a Biostatistics program, which better serves the needs of our students (Recommendation 3).
- Provided an exit survey to outgoing undergraduate students (Recommendation 4).

Some projects that are currently ongoing are -

- Decrease class sizes (Recommendation 1). This will not be an easy or fast problem to solve.
- Find more space (Recommendation 2). This again will not be an easy or fast problem to solve.
- Implement a capstone course (Recommendation 5). This is currently implemented at a small scale. It is expected that this will slowly be increased over time, although to expand this to all students would require significantly more resources than the faculty has.
- Career paths for lecturers (Recommendation 6). This is something that faculty is very aware of, and very interested in, but has little control over. It is hoped with the re-write of Policy 76 that some of the issues will be resolved.

The recommendation to hire our own (Recommendation 7) was not implemented, as it was felt that the current policy was a good policy. This was mentioned in the initial response to the reviewers' recommendations.

The last recommendation, to diversity the undergraduate student body (Recommendation 8), is currently being worked on at the faculty level. Although some progress has been made, this is something that the faculty will continue to work on for the foreseeable future.



Stephen M. Watt
Dean, Faculty of Mathematics





Two-Year Progress Report

Bachelor of Mathematics in Statistics, Statistics for Health, Actuarial Science, or Mathematical Finance (BMath)

June 2019

Background:

The most recent BMATH (Actuarial Science/Mathematical Finance/Statistics/Statistics for Health) self-study was submitted July 20, 2016 and the site visit occurred August 9-10th, 2016. The review team's report was received on November 2, 2016, and the program's response and implementation plan were submitted on February 4, 2017.

The Dean of Mathematics indicated his endorsement of the plan on January 4, 2018. The Final Assessment Report was approved at Senate Undergraduate Council on September 11, 2018 and at Senate on October 15, 2018.

The program reviewers were very positive about our programs. We repeat the program reviewers' executive summary below.

"In summary, we find all four programs to be very impressive in delivering quality education to top caliber students and producing graduates in high demand. Common strengths among all programs included outstanding leadership, faculty members, administrative support, and students. In particular, Professor Stefan Steiner is doing an outstanding job as Chair of the Department of Statistics and Actuarial Science in leading and guiding the various programs to achieve excellence in teaching, research and administration. The programs provide the necessary breadth of foundational courses to help students prepare for many careers in industry, as well as those intending to do advanced studies. The co-op program, which provides students gainful practical industry experience, was itself very impressive with strong positive reviews from both the students and employers. This highly successful co-op program provides a fairly unique experience for the students enrolled in these four programs."

Progress on Implementation Plan:

Below are listed all of the reviewers' recommendations and the program's progress on implementation.



1. Large class sizes. This is a result of the increased popularity (which is a good thing) of the programs and courses. However, this inhibits the optimal learning experience in these programs as the large class sizes make it very difficult, if not impossible, for the students to do projects (and an appropriate amount of applied work) which is an essential part of these programs and helps to solidify the theoretical and methodological knowledge gained from the courses. The only solution we [the reviewers] can see to reducing class size-particularly critical at the fourth year level – is the hiring of additional tenure-stream faculty and lecturers. In so doing, the balance of these two will be important to keep in mind: It seemed fairly reasonable at present with 42 tenure-stream faculty and 9 lecturers.

Status: in progress

Details: In the last number of years we have been able to hire more faculty. In particular, including individuals we hired this year but who have not yet arrived, we have increased our tenure/tenure-track complement to 49 faculty. We have also hired an additional lecturer and now have 10 long-term lecturers. With this increase in teaching resources we have been able to make progress in reducing some of the large class sizes, especially at the the upper year level. Median class sizes in ACTSC and STAT labelled courses have decreased by about 20-25% when comparing 2018 and 2015 although we still have the largest median class sizes in the Math faculty. Looking at the data, we see the least improvement for STAT courses at the third year level, where the median class size is 113 for courses taught in 2018. As new resources become available, we plan to make reducing third year STAT class sizes a priority.

2. Space implications. As is common with many universities, space is limited and a valued commodity. The Department of Statistics and Actuarial Science is practically out of space. Given further expected growth, which is essential to the well-being of each program (and is currently planned), future space needs will have to be addressed urgently. These include both office space for new faculty members and suitably-sized classroom space.

Status: in progress

Details: Space is indeed very tight in the Department. Unfortunately, the hoped-for Math 4 building has not yet been approved. In the meantime, we have tried to make better use of our existing space and have also been allocated some offices in the MC building. We recently renovated some space we previously used for Master's students and created a versatile space for up to 16 visitors. In addition, we have moved some retired faculty into shared space and are in the process of creating a new office in an empty space in our M3 building. These



changes will allow us to accommodate our expected needs for the next year. Assuming we continue to grow in the years ahead, which seems reasonable given our growth in undergraduate student numbers and the university's new budget model, we will soon be at capacity again.

3. Re-evaluate the goals and mission of the Bachelor of Mathematics in Statistics for Health. As discussed earlier in the report, it would be good to reassess the currently under-enrolled program in Statistics for Health. The current emphasis is on healthcare systems and includes numerous business courses. A more popular emphasis might be to frame it as more of a 'biostatistics' program with standard statistics courses, specific methodological courses for health data (e.g., courses on analysis of survival and longitudinal data), a few public health courses (e.g., epidemiology), and maybe one or two 'biology' courses. This recommended change in program emphasis may help with the low enrollment and should not require the introduction of many (if any) courses: Many (if not all) of these needed courses are already in place and being offered by the department. Attention should also be given to the number of required courses, since presently that number is large.

Status: completed

Details: We redesigned the Statistics for Health program into a [Biostatistics program](#). The changes result in a new program that has a stronger technical foundation and should appeal to Math students. The new program admitted its first students in Fall 2018.

4. Exit and follow-up surveys for graduates. A powerful way to market programs is to 'advertise' successful student placements, whether it be attractive positions in industry or enrollment in top graduate programs. The current tracking and monitoring of graduating students appears inadequate. Implementation of a formal exit survey would be a good start. Such a survey might collect information on: student satisfaction with the program, ways in which the program might get even better, plans for after graduation (i.e., job position, graduate school enrollment), and sustainable contact information. The latter pieces of information could be kept in a database and updated going forward. This will have the dual benefits of 'advertising' the success of the graduates for these programs, which will help the continued recruitment of top students, and for development, including identification of donors for endowed fellowships, chairs, etc.

Status: completed



Details: We implemented this suggestion. Beginning at the end of the Winter term in 2017, all our graduating students are given an online exit survey.

5. Introduce capstone courses for all programs. Capstone courses would be an important and attractive addition to all three programs to partially offset the problem caused by large advanced undergraduate courses and to provide an important project-based (case study) course in a small class size setting. We do understand, however, that to undertake this initiative, additional faculty would need to be hired or a reallocation of current resources would be required given the large numbers of fourth-year students across the programs.

Status: in progress

Details: Starting in 2017 we now offer a capstone course ([ACTSC 468](#)) for students in our Actuarial Science program. This course has limited enrolment because it involves case studies and student presentations, etc. We are keen to also offer a capstone course for Statistics and Mathematical Finance students. However, the main constraint here, as pointed out by the reviewers, is the lack of resources, especially when many of our other 4th year courses often have enrolments of over 100 students. To date we have not been able to offer a capstone style course for Statistics or Mathematical Finance students. In the last few years we have instead used our new teaching resources to reduce class sizes for our existing courses especially those at the third or fourth year level.

6. Career paths for lecturers. In discussion with a subset of the lecturers, it was apparent that they feel that the process for promotion from a term-to-term hire to a permanent continuing position is unclear. Further orientation and support from the administration of the department for the lecturers on this issue would help to alleviate career tension for the Lecturers currently on a term-to-term basis. A model such as an initial 2-year appointment, a subsequent 3-4-year appointment, and then promotion to Continuing Lecturer would be worth exploring. Some consideration of reduced teaching when preparing new courses would also be worth discussing.

Status: in progress

Details: This is not an issue that is completely under the control of the Department or even the Faculty. There is a university committee looking at revising [Policy 76](#) surrounding appointments and lecturers. However, progress has been slow. In the meantime, within the faculty we have adopted an informal approach to provide lecturers with more clarity on career progression. We aim to follow the approach of tenure-track faculty as closely as makes



sense. In particular, for all our recently hired lecturers we have given them three year contracts that are eligible once for renewal. At the end of these two contracts (6 years) they will be considered for continuing lecturer status.

7. Consider hiring Waterloo Actuarial Science PhDs. For the Actuarial Science program, hiring top faculty is challenging given the small number of strong Actuarial Science graduate programs in existence. On top of this, many of the top PhD's come from the graduate program at Waterloo. The policy of not hiring one's own graduates, which in general is a good policy, may restrict the necessary growth and maintenance of strength of the Actuarial Science program going forward.

Status: incomplete

Details: It is challenging hiring in the area of Actuarial Science. The field is relative small and PhD graduates have good career prospects in industry. Our current policy prohibits hiring our own PhD students in either Statistics or Actuarial Science unless they have been away for at least two years. This is consistent with university guidelines as provided by the Provost and also the direction supported by the Dean of the Faculty of Mathematics. So, we are able to hire our own graduates but only after they have been away for some time. We feel this is a good policy both for us and for our graduating students who benefit from seeing how things are done at other universities. In the past, considering our own students immediately after graduation has caused internal divisions that took a long time to heal. In addition, since this policy has been in effect, we have made some excellent hires. Since we are one of the top universities in the world for actuarial science we are attractive to many of the best recent PhD graduates from all over the world.

8. Increase diversity in enrollments. International students are predominantly from China. To increase diversity and to reduce the risk of that one market diminishing, it will be important to tap other markets (e.g., the Indian subcontinent). The department should explore the best options to do this. For example, there may be opportunities to leverage current university programs/partnerships to target potential students from other countries.

Status: in progress

Details: The Faculty of Math is acutely aware of our lack of diversity in international students and actively recruits in a number of countries around the world. We recently engaged a full time recruiter for India. We hope that in the future, our recruitment in other countries will be more effective. The Statistics and Actuarial Science department does not directly control admission into our programs since they are all second year entry. All our students apply to



the Honours Mathematics program at the University of Waterloo. Only after they have proven their ability in first year can they enroll as a major in one of our programs. As such, we have much less control over recruitment than some other Math faculty programs.

Explain any circumstances that have altered the original implementation plan:

n/a

Address any significant developments or initiatives that have arisen since the program review process, or that were not contemplated during the review:

Together with the School of Computer Science we have developed a joint degree in Data Science. The first students enrolled in this program in Fall 2017.



Updated Implementation Plan:

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	Reduce class sizes, particularly in fourth year courses	Hire more faculty	Chair/Dean	In progress. 2017-future
2.	Address future space needs (i.e., office space for new hires and suitably sized classroom space)	New fourth Math building proposed	Dean	In progress. Groundbreaking possibly in 2020
3.	Reevaluate the goals of the Statistics for Health program	Change the program into a degree in biostatistics	Steve Dreke, Assoc. Chair Undergraduate Studies	Complete. Program changes approved in time for Fall 2018 admission.
4.	A subcommittee of faculty who teach the relevant courses has been struck to review program and required courses	Design and implement survey for our graduating students	Carlos Mendes, Administrative Officer SAS	Complete. Started April 2017 and continuing
5.	Introduce capstone courses	Develop and offer capstone course for actuarial science students	Christiane Lemieux/David Landriault, Assoc. Chair Actuarial Science	In progress. First offering of capstone course for actuarial science students Winter 2017, scheduled for Winter term in future
6.	Further career path orientation and support from the administration of the program for lecturers	Develop two streams of lecturers – those with 3 year contracts that could lead to continuing lecturer positions and those with shorter 2 year contracts with no path to continuing lecturer	Chair, Dean	In progress. Implemented in an informal way. University policy review is underway, but completion time is not known.



7.	Consider hiring Waterloo Actuarial Science PhDs (Current university policy prohibits hiring our own PhD students in either Statistics or Actuarial Science unless they have been away for at least two years)	Current approach: Approach Waterloo Actuarial Science PhDs two years past graduation	Chair	Recommendation not supported by Dean and Provost. We plan to continue with our current approach.
8.	Increase diversity in enrollments (Statistics and Actuarial Science does not directly control admission into their programs since they are all second year entry. All students apply to the Honours Mathematics program at the University of Waterloo. Only after they have proven their ability in first year can they enroll as a major in one of our programs)	The Math faculty is working to increase diversity through recruiting trips to a variety of locations and through hiring a recruiting officer for India.	Serge D'Alessio , Math Faculty, Associate Dean Undergraduate Admissions and Outreach	In progress and ongoing.

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.

Report on anything else you believe is appropriate to bring to Senate concerning this program:

N/A



UNIVERSITY OF
WATERLOO

2022-2023

Date of next program review: _____

Date

Signatures of Approval:

A handwritten signature in blue ink, appearing to read "Stephen Hara".

May 15, 2018

Chair/Director

Date

A handwritten signature in blue ink, appearing to read "S. Hara".

Faculty or Administrative Dean

2018-06-15

Date

A handwritten signature in blue ink, appearing to read "Chris Inglis".

Associate Vice-President, Academic
(For undergraduate and augmented programs)

March 21, 2019

Date

Associate Provost, Graduate Studies
(For Graduate and augment programs)

Date

Checklist for SUC/SGRC Reviewer Feedback

Quality Assurance Office

Two-Year Progress Report: Bachelor of Mathematics in Statistics, Statistics for Health, Actuarial Science, or Mathematical Finance (BMath)

Name of Reviewer: Katherine Acheson

Date: 5/23/2019

Does the Two-Year Progress Report:

- | | | |
|--|---|-----------------------------|
| 1. Clearly describe progress achieved on the various action items in the implementation plan? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. Explain convincingly any circumstances that would have altered the original implementation plan? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. For items that are behind schedule, propose an amended implementation schedule that is reasonable and credible? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Address significant developments or initiatives that have arisen since the program review process, or that were not contemplated by the program review process? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

General Comments

This is a good report that reports good progress on all the proposals to address recommendations. It does seem a bit delayed, but that's not unusual.

Requested Revisions

In track changes in the document.

University of Waterloo
SENATE
Report of the President
21 October 2019

FOR INFORMATION

Recognition and Commendation

The Physics of Information lab, led by Professor **Achim Kempf**, was awarded one of the **2018 Google Faculty Research Awards**. Kempf's lab focuses on the physics of information, a wide research field that ranges from general relativity and quantum theory to information theory and artificial intelligence (AI). The Kempf lab received the Google award for a project in quantum machine learning. Kempf's PhD student **Guillaume Verdon** and his Master's student **Evan Peters**, with help from undergraduate student **Michael Broughton** pioneered this project which sits at the interface of quantum theory and deep learning. The research focuses on how artificial intelligence-like algorithms on a quantum computer can be paired, or hybridized, with artificial intelligence on a classical computer. The team caught Google's attention with substantial papers, such as [*A Universal Training Algorithm for Quantum Deep Learning*](#) in 2018, which details how quantum dynamics can be used to optimize classical and quantum neural networks. Within less than a year, researchers predict that quantum computers will reach the critical size beyond which a classical computer can model. Within about two to three years, quantum computers could provide calculational spaces that possess 10^{100} dimensions or more. This challenges researchers to now develop the first concrete applications for this upcoming quantum hardware. To meet this challenge, Kempf and his lab recently teamed up with the research groups of Professors David Gosset, Michele Mosca, Christine Muschik, and Alex Wong. The team, currently considering a further and larger collaboration with Google, is part of the highly developed ecosystem for quantum and computer science at the University of Waterloo. Collaborations like this one continue to further the University of Waterloo's position as the leading centre for cross-disciplinary quantum research.

(adapted from the *Applied Mathematics News*, 22 July 2019)

Four exceptionally talented students are making their way to Waterloo with a prestigious scholarship in tow. First-years **Evangeline Dryburgh** (mechatronic engineering – \$100,000), **Jason Amri** (computer science – \$80,000), **Shahed Saleh** (mechatronic engineering – \$100,000), and **Zeel Patel** (Physical Sciences [Astronomy/Physics] – \$80,000) are all winners of the **Schulich Leader Scholarships**, the largest STEM scholarship in Canada and valued at \$80,000 or \$100,000 for science, technology, engineering and mathematics (STEM) programs. The incoming Schulich Leaders distinguished themselves with high grades, leadership roles within their communities and participation in entrepreneurial ventures. Majoring in either mathematics, science or engineering, the four were selected from more than 1,400 nominees across Canada vying for one of only 50 scholarships.

(adapted from the *Daily Bulletin*, 21 August 2019)

The **Institute of Physics (IOP)** has named **Donna Strickland** one of four Honorary Fellows for her pioneering method of generating high-intensity, ultrashort optical pulses. The IOP is the professional body for physics in the UK and Ireland. The Honorary Fellowship is its highest accolade, reserved for individuals who make exceptional contributions to physics. The four honourees bring the total number to 62, a list that also includes Professor Stephen Hawking. Strickland visited the IOP in London in February.

Earlier that same day, fellow honouree Al-Khalili interviewed Strickland on The Life Scientific, a popular science program he hosts on BBC Radio Four.

(adapted from the *Daily Bulletin*, 30 August 2019)

Eight University of Waterloo researchers have been named fellows of the Royal Society of Canada (RSC) and members of the Royal Society of Canada's College of New Scholars, Artists and Scientists. They are among 93 new fellows elected by their peers for outstanding scholarly, scientific, and artistic achievement and 46 new members of the College across Canada, announced on September 10.

Waterloo's new RSC fellows and members are:

Fellows of the Royal Society of Canada

Raouf Boutaba (Cheriton School of Computer Science) is an internationally acclaimed authority and leading researcher in the management of communication networks. He is particularly known for his pioneering contributions to automated management which directly led to the trend toward autonomic networking, and for his groundbreaking work on network virtualization and network softwarization expected to revolutionize the way communication networks are designed, operated, and managed.

Zhongwei Chen (chemical engineering) is an outstanding researcher and global leader in advanced materials for next-generation battery and fuel cell technologies. His work has received over 20,000 citations and has led to the establishment of deep collaborative partnerships and several technology companies in Canada and around the world. Professor Chen is a Fellow of the Canadian Academy of Engineering and a 2016 recipient of the NSERC Steacie Memorial Fellowship.

Michel Gingras (physics and astronomy) has made internationally acclaimed contributions to the field of condensed matter physics, in particular in the area of magnetic materials subject to strongly competing or frustrated interactions, as well as condensed matter systems subject to frozen random disorder. Using analytical and numerical methods, he has explained a number of long-standing experimental paradoxes, provided an impetus for new experimental studies and motivated the synthesis of new magnetic compounds.

Srinivasan Keshav (Cheriton School of Computer Science) has an outstanding international reputation for his groundbreaking work in two distinct fields: computer networking and energy systems. He has made innovative contributions to network congestion control and simulation; wireless networking; and the application of computer networking principles to energy systems in the emerging area of energy informatics. Professor Keshav is a Fellow of both the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers.

Winfried Siemerling (English language and literature) is internationally recognized for his pioneering work on Canadian and other North American literatures and cultures in comparative and transnational perspectives. Critically acclaimed for his incisive theorization of English, French, and black Canadian writing, Professor Siemerling has influentially repositioned Canadian cultural achievement within broader North American, hemispheric, and transatlantic contexts, breaking new ground with prize-winning works like *The New North American Studies* (2005) and *The Black Atlantic Reconsidered* (2015).

Donna Strickland (physics and astronomy) is a recipient of the Nobel Prize in Physics 2018 for co-inventing chirped pulse amplification (CPA), the method for creating high-intensity, ultrashort optical pulses. CPA revolutionized the field of high-intensity laser physics, leading to the most intense lasers

ever. The work provided new information on the way light interacts with matter. It has applications from medicine to manufacturing.

Members of the Royal Society of Canada's College of New Scholars, Artists and Scientists

Nandita Basu (civil and environmental engineering) is internationally recognized for seminal contributions to ecohydrology and water sustainability in human-impacted environments. Her groundbreaking work on the long-term effects of fertilizer and intensive livestock production on water quality has led to new understanding of the role nutrient legacies play in preventing achievement of water quality goals, and has helped to identify management approaches to improve water quality in lakes and coastal zones.

Juewen Liu (chemistry) has gained a national and international reputation for his contributions in enzyme mimics, bioanalytical chemistry, and biointerface chemistry. His team discovered many new DNA sequences for detecting heavy metals and water quality monitoring. He has authored many highly cited papers and his leadership in the analytical and nanotechnology communities has been recognized by many awards.

The **American Society of Mechanical Engineers** (ASME) is an organization dedicated to helping the global engineering community develop solutions to benefit lives and livelihoods. This year, fourth year mechanical engineering student, **Kevin Qiu**, had the opportunity to present at the ASME 2019 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE) in Anaheim, California. Qiu also received a grant from the Sanford Fleming Foundation at the University of Waterloo which partially covered his travel costs. Qiu's presentation centred around the work he had accomplished at one of his co-op placements, involving gear design.

(adapted from the *Daily Bulletin*, 11 September 2019)

Multiple scientists and researchers within the Centre for Ocular Research and Education (CORE), have been named as part of **Expertscape's top 60 Expertise in Contact Lenses: Worldwide**. Topping the list at number one is the director of CORE, **Lyndon Jones**, PhD, DSc, FCOptom, FAAO. "I'm humbled to be recognized alongside so many peers from around the world who are constantly adding to the growing and fascinating body of knowledge surrounding various contact lens-related topics," Dr. Jones told *Optical Prism*. "They are close collaborators, incredibly talented professionals and personal friends in many cases. Day in and day out at CORE, I'm privileged to partner with the most dedicated and brilliant leaders in the field." Dr. Jones' research primarily focuses on the interaction of novel and existing contact lens materials with the ocular environment, dry eye, and the development of novel materials for ocular drug delivery. CORE also has three other team members and four former CORE staff members, who have moved onto other roles within the ophthalmic spectrum, ranked within the list. Within CORE at #23 is **Desmond Fonn**, distinguished professor emeritus and founding director; at #48 is **Doerte Luensmann**, senior clinical scientist; and at #58 is **Chau-Minh Phan**, postdoctoral fellow. In addition, Expertscape places the University of Waterloo as the number two institution on their list of top experts in contact lenses, after the University of New South Wales in Sydney, Australia. Two faculty members at the School of Optometry & Vision Science are also listed within the top 60: Professor **Luigina Sorbara** at #25 and Professor **Trefford Simpson** at #45.

(adapted from the *Daily Bulletin*, 12 September 2019)

Donna Strickland, Waterloo professor and Nobel laureate in physics, was honoured with the **Golden Plate Award from the Academy of Achievement**. **Frances Arnold**, Caltech professor and Nobel laureate in chemistry, nominated Strickland and gave her the award. The ceremony took place on September 14 in New York City. Strickland and Arnold were the only women among the 2018 Nobel Prize winners in science categories. The Academy of Achievement, officially known as the American Academy of Achievement, was founded in 1961 and honours 25 people per year at the Banquet of the Golden Plate. The Academy is based in Washington, D.C.

(adapted from the *Daily Bulletin*, 24 September 2019)

University of Waterloo
REPORT OF THE DEAN OF APPLIED HEALTH SCIENCES TO SENATE
October 21, 2019

FOR INFORMATION

A. APPOINTMENTS

Research Reappointment

DAWCZYK, Anna, Research Associate, Department of Recreation and Leisure Studies, September 1, 2019 – December 31, 2019.

Graduate Supervision

LEE, Joonwu, Associate Professor, School of Public Health and Health Systems, September 1, 2019 – August 31, 2020.

Special Appointments

Undergraduate Instruction

VALTCHANOV, Bronwen, Lecturer, Department of Recreation and Leisure Studies, September 1, 2019 – December 31, 2019.

Postdoctoral Appointments

AMELARD, Robert, Department of Kinesiology, September 1, 2019 – August 31, 2020

SAARI Margaret, School of Public Health and Health Systems, extended appointment to January 1, 2020.

MASTRANDREA, Carmelo, Department of Kinesiology, January 1, 2020 - December 31, 2021.



Lili Liu, Dean
Applied Health Sciences

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF THE FACULTY OF ARTS TO SENATE
October 21, 2019

FOR INFORMATION

A. APPOINTMENTS

Tenure

STOUGHTON, Neal, (BS 1976 University of Southern California, MS 1977, PhD 1983 Stanford University), Professor, School of Accounting and Finance, September 1, 2019. Dr. Stoughton has had multiple academic appointments at various Universities around the world. His longest appointment was at the University of California, Irvine. He also served as the Macquarie Bank Chair in Financial Services at the University of New South Wales. Recently, he split his time between the University of Arizona and the Vienna University of Economics and Business.

Definite Term Appointments

CHENIER, Allison, (BA 2007 McMaster University, MA 2009 University of Guelph), Lecturer, Department of Sociology and Legal Studies, September 1, 2019 to August 31, 2020. Allison Chenier is completing her PhD in Sociology in our Department (expected Fall 2019). She has four co-authored refereed publications in high quality journals in the areas of crime, policing, and justice. She has extensive undergraduate teaching experience, having taught 22 courses at Waterloo and other academic institutions. Her area of research expertise is the socio-legal regulation of behaviour, with a particular focus on youth justice, female crime, school safety, and policing. Ms. Chenier will augment the department's teaching and service commitments to our growing undergraduate Sociology and Legal Studies programs.

Visiting Appointment

HARRINGTON, Alexandra, Visiting Scholar, Department of Political Science, September 3, 2019 to December 31, 2019.

Adjunct Appointments – Instruction

EZEH, Alphonsus Onyeka, Lecturer, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

HUEBNER, Jefferson, Lecturer, Department of Political Science, September 1, 2019 to December 31, 2019.

LAVENDER, Patrick, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

LOCHNER, Martin, Lecturer, Faculty of Arts, September 1, 2019 to December 31, 2019.

RODRIGUEZ, Miquelon, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

SIDERIS, Alice, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

Adjunct Reappointments – Instruction

ALMAULA, Mirali, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

ARIAS, Juan, Lecturer, Department of Spanish and Latin American Studies, September 1, 2019 to December 31, 2019.

BALAISIS, Nicholas, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

BEER, Lacey, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

BRASSARD, Brooke, Lecturer, Faculty of Arts, September 1, 2019 to December 31, 2019.

BRIGGS, Catherine, Lecturer, Department of History, September 1, 2019 to December 31, 2019.

BULLOCH, Dean, Lecturer, Department of Psychology, September 1, 2019 to December 31, 2019.

CHAPUT, Louise, Lecturer, Department of Political Science, Master of Public Service, September 1, 2019 to December 31, 2019.

CHASMAR, Hugh, Lecturer, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

COCARLA, Sasha, Lecturer, Department of Philosophy, September 1, 2019 to December 31, 2019.

COOK, Brad, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

DAL CASTEL, Kate, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

DE ROOIJ-MOHLE, Margreet, Lecturer, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

DE ROOVER, Megan, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

ENNIS, Richard, Lecturer, Department of Psychology, September 1, 2019 to December 31, 2019.

FOLLETT, Alec, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

GERNON, Marc, Lecturer, Department of Psychology, September 1, 2019 to December 31, 2019.

GLADKOVA, Olga, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

HARVIE, Jo, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

HAYES, Nicole, Lecturer, Department of Anthropology, September 1, 2019 to December 31, 2019.

HILL, Heather, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

HOLMES, Trevor, Lecturer, Department of Philosophy, September 1, 2019 to December 31, 2019.

HOSSEINI, Mohsen, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

HUTCHISON, Jesse, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

IV, Kieng, Lecturer, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

JAIMES-DOMINGUEZ, Luis, Lecturer, Department of Spanish and Latin American Studies, September 1, 2019 to December 31, 2019.

JANG, Lauri, Lecturer, Faculty of Arts, September 1, 2019 to December 31, 2019.

KLASSEN, Christine, Lecturer, Faculty of Arts, September 1, 2019 to December 31, 2019.

LAM, Ibis, Lecturer, Department of Spanish and Latin American Studies, September 1, 2019 to December 31, 2019.

LAZAR, Karen, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

MACDONALD, Christy, Lecturer, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

MCDERMOTT, Neil, Lecturer, Department of Psychology, September 1, 2019 to December 31, 2019.

MIAN, Haaris, Lecturer, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

MOTA, Fatima, Lecturer, Department of Spanish and Latin American Studies, September 1, 2019 to December 31, 2019.

MANJI, Noorin, Lecturer, Department of Sociology and Legal Studies, September 1, 2019 to December 31, 2019.

OFILL, Patricia, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

PEARCE, Joanna, Lecturer, Department of History, September 1, 2019 to December 31, 2019.

PECKHAM, Will, Lecturer, Department of Psychology, September 1, 2019 to December 31, 2019.

PLOWMAN, Robert, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

POTTER, Gareth, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

RAHMAN, Fiona, Lecturer, Department of Economics, September 1, 2019 to December 31, 2019.

REDDOCK, Jennifer, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

RIZK, Jessica, Lecturer, Department of Sociology and Legal Studies, September 1, 2019 to December 31, 2019.

ROSSITER, Simon, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

SCHWARTZ, Shira, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

SHANJANI, Basit, Lecturer, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

SIDER, Kimber, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

SILK, Matthew, Lecturer, Department of Philosophy, September 1, 2019 to December 31, 2019.

SLETHAUG, Gordon, Professor, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

SMITH, Greg, Lecturer, Stratford School of Interaction Design and Business, September 1, 2019 to December 31, 2019.

STACEY, Jeffery, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

STETTNER, Shannon, Lecturer, Department of Philosophy, September 1, 2019 to December 31, 2019.

VANCE, Don, Lecturer, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

WHITE, Matthew, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

WIENS, Brianna, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

WOODFORD, Benjamin, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

WYSE, Bruce, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

ZMETANA, Katherine, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

Adjunct Reappointments – Cancelled

MORENO OJEDA, Diana, Lecturer, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

Adjunct Reappointments – Miscellaneous (research, consultations, etc.)

BOLT, Laura, Lecturer, Department of Anthropology, August 1, 2019 to August 31, 2021.

ROSS, Michael, Professor, (Professor Emeritus), Department of Psychology, September 1, 2019 to August 31, 2021.

Adjunct Reappointments – Graduate Supervision

COVIN, Roger, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

DUBOIS, Stephanie, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

ETHIER, Nicole, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

GAVRIC, Dee, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

GIFFORD, Shannon, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

HENDRY, Carol-Anne, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

HOOD, Heather, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

LANE, Christopher, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

LEMARQUAND, David, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

MCHUGH, Anne, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

MCINTYRE-SMITH, Alexandra, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

REIMER, Susanna, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

SPENCER, Steven, Professor, Department of Psychology, September 1, 2019 to August 31, 2021.

TOMPKINS, Season, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

STEVENS, Elizabeth, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

TOMAN, Philip, Clinical Supervision, Department of Psychology, September 1, 2019 to August 31, 2020.

Research Faculty

WELLUM, Caleb, Research Associate, Department of Communication Arts, September 1, 2019 to August 31, 2021.

Graduate Students Appointed as Part-Time Lecturers

ALTAHER, Ayesha, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

ASHBURNER, Michelle, Department of Psychology, September 1, 2019 to December 31, 2019.

BARNETT, Richard, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

BATIOT, Maxime, Department of French Studies, September 1, 2019 to December 31, 2019.

BERIAULT, Phillipe, Department of Philosophy, September 1, 2019 to December 31, 2019.

BHOYROO, Haneesha, Department of French Studies, September 1, 2019 to December 31, 2019.

BREY, Elizabeth, Faculty of Arts, September 1, 2019 to December 31, 2019.

CAMERON, Christopher, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

CARPENTER, Justin, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

DESHANE, Evelyn, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

DUSOWOTH, Sushma, Department of French Studies, September 1, 2019 to December 31, 2019.

GARIEPY, Émilie, Department of French Studies, September 1, 2019 to December 31, 2019.

GIGUÉRE, Frédéric, Department of French Studies, September 1, 2019 to December 31, 2019.

GNANIAH, Vanya, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

HU, Wanzhi, Department of Fine Arts, September 1, 2019 to December 31, 2019.

IRWIN, Ashley, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

KIM, Jin Sol, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

LARCHE, Chanel, Department of Psychology, September 1, 2019 to December 31, 2019.

LOK, Chris, Department of Psychology, September 1, 2019 to December 31, 2019.

MACDONALD, Ian, Department of Philosophy, September 1, 2019 to December 31, 2019.

MARSH, Sara, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

MASCELLA, Allison, Department of Political Science, Master of Public Service, September 1, 2019 to December 31, 2019.

MASSIA, Kyle, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

MCCHESNEY, Dylan, Department of Philosophy, September 1, 2019 to December 31, 2019.

MCTAVISH, Sarah, Department of History, September 1, 2019 to December 31, 2019.

MITCHELL, James, Department of French Studies, September 1, 2019 to December 31, 2019.

MORIARTY, Devon, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

MUGON, Jhotisha, Faculty of Arts, September 1, 2019 December 31, 2019.

MUNRO, Zachary, Department of Sociology and Legal Studies, September 1, 2019 to December 31, 2019.

OAKES, Harrison, Department of Psychology, September 1, 2019 to September 15, 2019.

POLAN, Kayla, Department of Fine Arts, September 1, 2019 to December 31, 2019.

RAWDING, Jay, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

SCHRIM, Ronald Sam, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

SEWELL, Jamie, Department of Philosophy, September 1, 2019 to December 31, 2019.

SULLIVAN, Alexander, Department of Germanic and Slavic Studies, September 1, 2019 to December 31, 2019.

TANG, Rachel, School of Accounting and Finance, September 1, 2019 to December 31, 2019.

TORBICA, Masa, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

VIST, Mari Elise, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

WATTS, Hannah, Department of English Language and Literature, September 1, 2019 to December 31, 2019.

Staff Appointments to Faculty

CAMPBELL, Greg, Lecturer, Department of Communication Arts, September 1, 2019 to December 31, 2019.

DI GRAVIO, Katrina, Lecturer, Department of Psychology, September 1, 2019 to December 31, 2019.

B. ADMINISTRATIVE APPOINTMENTS

CHANGE in DATES

WARLEY, Linda, Associate Dean, Graduate Studies, **from** January 1, 2019 to June 30, 2020 **to** January 1, 2019 to December 31, 2019.

C. SABBATICAL LEAVES

For approval by the Board of Governors:

ELIASMITH, Chris, Professor, Department of Philosophy and Systems Design Engineering, May 1, 2020 to April 30, 2021, twelve months at 85% salary.

NGUYEN, Tu, Assistant Professor, School of Accounting and Finance, January 1, 2020 to June 30, 2020, six months at full salary.

O'NEILL, Daniela, Professor, Department of Psychology, January 1, 2020 to June 30, 2020, six months at 85% salary.



Sheila Ager
Dean, Faculty of Arts

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF ENGINEERING TO SENATE
October 21, 2019

FOR INFORMATION

A. *APPOINTMENTS*

Probationary Term Reappointment

BOGER, Jennifer, Assistant Professor, Department of Systems Design Engineering, July 1, 2019 – June 30, 2022. PhD, Life and Health Sciences, University of Ulster, Jordanstown, United Kingdom, 2014; MSc, Biomedical Engineering, Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, ON, 2004; BSc, Biological Engineering, School of Engineering, University of Guelph, Guelph, ON, 2002.

New Definite Term Appointment-full-time

LIM TUNG, Fiona, Lecturer, School of Architecture, September 1, 2019 – August 31, 2020. Master of Architecture, University of Toronto, Toronto, ON, 2009; Honours, BA, Architectural Studies, University of Toronto, Toronto, ON, 2003. (Fractional load, FTE 50% with 80% teaching and 20% service weighting).

MATHER, David, Lecturer, Joint appointment in Department of Mechanical & Mechatronics Engineering (60%) and Civil & Environmental Engineering (40%), with 80% teaching, 0% scholarship and 20% service weighting. September 1, 2019 – August 31, 2022. PhD Candidate in Sustainability Management, University of Waterloo, Waterloo, ON, (part-time) September 2018 – present; Candidate for PhD in Mechanical Engineering, University of Waterloo, Waterloo, ON, May to December 2002: discontinued (partial completion and withdrew voluntarily to return to full-time employment); Master of Applied Science in Mechanical Engineering, University of Waterloo, Waterloo, ON, 2000; Bachelor of Applied Science in Mechanical Engineering, University of Waterloo, Waterloo, ON, 1998.

New Definite Term Reappointment-full-time

ROBINSON, Mary, Lecturer, Engineering Undergraduate Office, September 1, 2019 – December 31, 2019. Master of Applied Science in Chemical Engineering, University of Waterloo, Waterloo, ON, 2010; Certificate in University Teaching, Centre for Teaching Excellence, University of Waterloo, Waterloo, ON, 2009; Bachelor of Applied Science in Chemical Engineering, Honours, Co-operative Education, Department of Chemical Engineering, University of Waterloo, Waterloo, ON, 2002.

Visiting Appointments

AZIMIFAR, Zohreh, Associate Professor, Department of Systems Design Engineering, June 22, 2019 – September 15, 2019.

BARBOSA, Bruno, Scholar, Department of Mechanical and Mechatronics Engineering, January 1, 2020 – December 31, 2020.

CON, Celal, Scientist, Department of Electrical & Computer Engineering, September 1, 2019 – August 31, 2021.

DICKERT, Julian, Scholar, Department of Electrical & Computer Engineering, September 1, 2019 – January 1, 2020.

GERAKOPULOS, Ryan, Researcher, Department of Electrical & Computer Engineering, August 19, 2019 – August 18, 2020.

Haj Mirza Alian Aminabadi, Ehsan Scientist, Department of Electrical & Computer Engineering, February 5, 2019 – February 4, 2020.

HUANG, Bo, Scholar, Department of Systems Design Engineering, July 8, 2019 – October 10, 2019.

LAGHI MRABAT, Mariam, Scholar, Department of Electrical & Computer Engineering, September 5, 2019 – February 14, 2020.

LIU, Jie, Scholar, Department of Chemical Engineering, December 2, 2019 – December 1, 2020.

MAGNIER, Clara, Scholar, Department of Electrical & Computer Engineering, September 5, 2019 – February 14, 2020.

MAO, Weiping, Scholar, Department of Mechanical & Mechatronics Engineering, September 5, 2019 – December 4, 2019.

PARPAILLON, Emilie, Scholar, Department of Systems Design Engineering, September 2, 2019 – February 14, 2020.

NAEEM, Ahmad, Scholar, Department of Systems Design Engineering, September 15, 2019 – December 14, 2019.

SARWAT, HUSSEIN, Researcher, Department of Mechanical & Mechatronics Engineering, September 21, 2019 – January 17, 2020.

SCHMIDT, Jesse, Scientist, Department of Electrical & Computer Engineering, September 1, 2019 – August 31, 2020.

SONG, Gang, Scholar, Department of Mechanical & Mechatronics Engineering, November 1, 2019 – October 31, 2020.

TANTER, Sophie, Scholar, Department of Systems Design Engineering, September 2, 2019 – February 14, 2020.

WANG, Jun, Scholar, Department of Electrical & Computer Engineering, August 19, 2019 – August 18, 2020.

WEI, Shuhua, Scholar, Department of Electrical & Computer Engineering, August 26, 2019 – August 25, 2020.

XU, Nan, Scholar, Department of Mechanical & Mechatronics Engineering, September 17, 2019 – September 16, 2020.

YAN, Xiaoxia, Researcher, Department of Management Sciences, January 1, 2020 – December 31, 2020.

Visiting Reappointments

ANGAMMANA, Chitral, Researcher, Department of Electrical & Computer Engineering, June 21, 2019 – June 20, 2021.

IHEANACHO, Bright Chijioke, Scientist, Department of Electrical & Computer Engineering, September 1, 2019 – August 31, 2021.

ISLAM, Md. Shariful, Scholar, Department of Electrical & Computer Engineering, October 1, 2019 – September 30, 2020.

MECHLER, Meaghan, Scholar, Department of Chemical Engineering, September 1, 2019 – December 31, 2019.

ZAMANI SIBONI, Hossein, Scholar, Department of Electrical & Computer Engineering, September 1, 2019 – August 31, 2020.

ZHANG, Yan, Researcher, Department of Civil & Environmental Engineering, December 1, 2019 – June 30, 2020.

Special Appointments

Undergraduate Instruction

AHMADI, Lena, Lecturer, Department of Chemical Engineering, September 1, 2019 – December 31, 2019.

BALAGENGATHARADILAK, Saarinen, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

BALESHTA, James, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

BECK RUBIN, Eric, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

BEYLUNIOGLU, Fuat Can, Lecturer, Department of Management Sciences, September 1, 2019 – December 31, 2019.

COOPER-STACHOWSKY, Michael, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

CHUNG, Audrey, Lecturer, Department of Systems Design Engineering, September 1, 2019 – December 31, 2019.

FOHRING, Michael, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

GHANNOUM, AbdulRahman, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

GHAVAM, Kamyar, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

GRYGUC, Andrew, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

HAGHI, Ehsan, Lecturer, Department of Chemical Engineering, September 1, 2019 – December 31, 2019.

HASHEMI, Ehsan, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

HEBERT, Marie, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

HOLT, Christopher, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

HUNSBERGER, Eric, Lecturer, Department of Systems Design Engineering, January 1, 2019 – April 30, 2019.

MCCLOSKEY, PIERCE, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

MCMILLAN, Jason, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

MURESAN, Mathew, Lecturer, Department of Civil & Environmental Engineering, September 1, 2019 – December 31, 2019.

NAKAMURA, Hajime, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

PARKIN, James Cameron, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

SAID, Mohamed, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

TURHAN, Mustafa Hakan, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

Special Appointments

Graduation Instruction

BABAE CHESHMEAHMADREZAEI, Reza, Lecturer, Department of Electrical and Computer Engineering, September 1, 2019 – December 31, 2019.

BANSAL, Harvir, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

CHANG, Wayne, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

IOANNIDIS, Marios, Lecturer, Department of Chemical Engineering, September 1, 2019 – December 31, 2019.

JACKSON, Tim, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – June 30, 2020.

MALHOTRA, Shavin, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

MARTIN, Tim, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

MURESAN, Mathew, Lecturer, Department of Civil & Environmental Engineering, September 1, 2019 – December 31, 2019.

RAHIMI, Fahimeh, Lecturer, Department of Management Sciences, September 1, 2019 – December 31, 2019.

RUFFUDEEN, Zamal, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

WANG, Chaoran, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

Special Appointments

Other

BEYNON, Doug, Entrepreneur-in-Residence, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – August 31, 2020.

Special Reappointments

Undergraduate Instruction

BISSETT, Tara, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

BYSKAL, Daniel, Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

DAMIANI, Roberto, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

MOUSAVI LAJIMI, S. Amir, Lecturer, Department of Systems Design Engineering, September 1, 2019 – December 31, 2019.

PEARSON, Christine, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

SIMMS, Genevieve, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

SCHREINER, Kristin, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

WANG, Jiaming (James), Lecturer, Department of Mechanical & Mechatronics Engineering, September 1, 2019 – December 31, 2019.

Special Reappointments

Graduate Instruction

HURWITZ, Marc, Lecturer, Conrad Business Entrepreneurship & Technology Centre, September 1, 2019 – December 31, 2019.

SALAMA, Magdy, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

TYRRELL, Jonathan, Lecturer, School of Architecture, September 1, 2019 – December 31, 2019.

Adjunct Appointments

Graduate Supervision and Research

KUDSIA, Chandra, Professor, Department of Electrical & Computer Engineering, September 1, 2019 – June 30, 2023.

SCHMITKE, Chad, Assistant Professor, Department of Systems Design Engineering, August 1, 2019 – July 31, 2022.

Adjunct Appointments

Graduate Supervision

BENNEKER, Anne, Assistant Professor, Department of Chemical Engineering, September 1, 2019 – August 31, 2021.

CHEN, Yongsheng, Associate Professor, Department of Mechanical & Mechatronics Engineering, August 1, 2019 – July 31, 2022.

DENBURG, Avram, Assistant Professor, Department of Management Sciences, August 1, 2019 – July 31, 2022.

OKWUDIRE, Chinedum, Associate Professor, Department of Mechanical & Mechatronics Engineering, August 1, 2019 – July 31, 2022.

UZAROWSKI, Ludomir, Assistant Professor, Department of Civil & Environmental Engineering, August 1, 2017 – July 31, 2019.

Adjunct Reappointments

Research and Graduate Supervision

OZALTIN, Osman, Y, Assistant Professor, Department of Management Sciences, September 1, 2019 – August 31, 2022.

VARAMINI, Sina, Assistant Professor, Department of Civil & Environmental Engineering, June 1, 2019 – May 31, 2021.

ZHAO, Xuan (Jen), Professor, Department of Management Sciences,
September 1, 2019 – August 31, 2022.

Adjunct Reappointments

Research

GABRIEL, Amir (Mel), Assistant Professor, Department of Management Sciences,
November 1, 2019 – October 31, 2022.

Adjunct Reappointments

Other

SMITH, Larry, Associate Professor, Conrad Business Entrepreneurship & Technology
Centre, January 1, 2020 – December 31, 2020.

Cross Appointments

SCHNEIDER, Oliver, Assistant Professor, Management Sciences to Department of
Electrical & Computer Engineering, September 1, 2019 – August 31, 2022.

Changes in Appointments

WEI, Lan, Assistant Professor, Department of Electrical & Computer Engineering,
probationary term reappointment, July 1, 2018 – June 30, 2021; end date is being
to June 30, 2022, (for parental leave June 3, 2019 to November 27, 2020).

B. ADMINISTRATIVE APPOINTMENTS

LEVINE, Peter, Undergraduate Academic Advisor, Department of Electrical &
Computer Engineering May 1, 2018 – April 30, 2020.

FOR APPROVAL BY THE BOARD OF GOVERNORS

C. SABBATICALS

GOLDTHORPE, Irene, Associate Professor, Department of Electrical & Computer
Engineering, May 1, 2020 – April 30, 2021, one year leave at 85% salary.

SAARI, Rebecca K. Assistant Professor, Department of Civil & Environmental
Engineering, January 1, 2010 – June 30, 2020 (July 1- Aug 31 NT), half-year leave at
100% salary.

ZHOU, Norman, Professor, Department of Mechanical and Mechatronics Engineering,
January 1, 2020 to June 30, 2020, half-year leave at 100% salary, Non-teaching term, July
1, 2020 to August 31, 2020 at 100% salary.



Pearl Sullivan
Dean, Faculty of Engineering

University of Waterloo
REPORT OF THE DEAN OF ENVIRONMENT TO SENATE
October 21, 2019

FOR INFORMATION

A. APPOINTMENTS

Tenure

JARVIE, Helen, Professor, Department of Geography and Environmental Management, January 1, 2020. Ph.D University of Reading, 1995; MA University of Oxford, 1995; BA (Hons) University of Oxford, 1991. Dr. Jarvie brings core expertise in biogeochemistry, limnology, nutrient sources and cycling, and eutrophication. Her appointment results from a search for an Exceptional Hire in Water and Global Environmental Change that was conducted through the Water Institute. Her focus will be on the global water cycle, including groundwater, under conditions of global environmental change, quantifying, analyzing, and predicting the linkages and interactions between climate, hydrological and biogeochemical cycles and water security management and adaptation responses. She has a long history of mentoring young professionals in her role as research program director at her institution. She has provided supervision of graduate students, post-doctoral fellows and junior research colleagues.

Probationary Term Appointment

LEWIS, Quinn, Assistant Professor, Department of Geography and Environmental Management, January 1, 2020 to June 30, 2023: Ph.D, University of Illinois, 2018; MS, University of Illinois, 2014; BS, University of Wisconsin, 2011. Quinn will join the department in January 1, 2020 as Assistant Professor in physical geography after conducting postdoctoral research at the University of Indiana's Environmental Resilience Institute. His research interests are broad, but largely related to process fluvial geomorphology and landforms associated with flowing water on the surface of the Earth. He is especially interested in how innovative fieldwork, geospatial methods such as remote sensing and GIS, and interdisciplinary approaches can be used to advance our understanding of fundamental and applied complex problems in fluvial geomorphology. Key Areas of graduate supervision: fluvial geomorphology, remote sensing, geospatial analysis, river management and the impacts of climate change on river systems.

Definite Term Appointment

DICKINSON, Brock, Lecturer, Faculty of Environment, October 1, 2019 to August 31, 2021. MA (with distinction), Brock University, 2007; BA, University of North Carolina at Chapel Hill, 1989. Brock Dickinson was the founder and CEO of MDB Insights, the largest consulting firm specializing in economic development services in Canada. Previous positions were held with the United Nations Environment Program, local and provincial governments. He has published extensively on entrepreneurship and economic development and brings a valuable network of contacts and experience to share with students in the Master of Economic Development and Innovation and other programs across the Faculty.

Special Appointments

Instruction

ADLER, Nancy, Lecturer, School of Planning, September 1, 2019 to December 31, 2019.

ANDERSON, Dana, Lecturer, School of Planning, September 1, 2019 to December 31, 2019.

BRAUNSTEIN-SCUDERI, Martina, Studio Facilitator/Professional Support, School of Planning, September 1, 2019 to December 31, 2019.

CASTON, Wayne, Lecturer, School of Planning, September 1, 2019 to December 31, 2019.

LEHMAN, Robert, Lecturer, School of Planning, September 1, 2019 to December 31, 2019.

SOLLY, Jeffrey, Lecturer, School of Planning, January 1, 2020 to April 30, 2020.

TRUONG, Evan, Studio Support/Professional Support, School of Planning, September 1, 2019 to December 31, 2019.

Cross Appointments

BIGELOW, Philip, Associate Professor, School of Public Health and Health Systems [Faculty of Applied Health Sciences] to the School of Planning September 1, 2019 to August 31, 2022.

PITTMAN, Jeremy, Assistant Professor, School of Planning to School of Environment, Resources and Sustainability, September 1, 2019 to August 31, 2022.

B. ADMINISTRATIVE APPOINTMENT

MURPHY, Stephen, Associate Director, Undergraduate Studies, School of Environment, Resources and Sustainability, September 1, 2019 to August 31, 2020.

ADMINISTRATIVE RE-APPOINTMENT

SCOTT, Daniel, Executive Director, Interdisciplinary Centre on Climate Change (IC3), July 1, 2019 to June 30, 2020.

C. SABBATICAL LEAVES

For Approval by the Board of Governors

DOW, Christine, Assistant Professor, Department of Geography and Environmental Management, January 1, 2020 to June 30, 2020 at 100% salary.

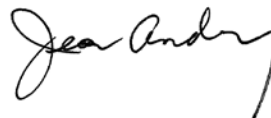
GEOBEY, Sean, Assistant Professor, School of Environment, Enterprise and Development, November 1, 2019 to April 30, 2020 at 100% salary.

MCCARTHY, Daniel, Associate Professor, School of Environment, Resources and Sustainability, July 1, 2019 to December 31, 2019 at 100% salary.

PARKER, Paul, Professor, School of Environment, Enterprise and Development, January 1, 2020 to June 30, 2020 at 100% salary; January 1, 2021 to November 30, 2021 at 100% salary.

ROBINSON, Derek, Associate Professor, Department of Geography and Environmental Management, July 1, 2020 to December 31, 2020 at 85% salary.

SINGH, Simron, Associate Professor, School of Environment, Enterprise and Development, January 1, 2020 to December 31, 2020 at 100% salary.



Jean Andrey
Dean

University of Waterloo
REPORT OF THE DEAN OF MATHEMATICS TO SENATE
October 21, 2019

FOR INFORMATION

A. APPOINTMENTS

Definite Term - Reappointments

NAEEM, Nomair, Lecturer, David R. Cheriton School of Computer Science, September 1, 2019 – August 31, 2022.

Visiting Appointments

DANIELS, Lindsey, Research Associate, Dept. of Applied Mathematics, September 1, 2019 – December 31, 2019.

Adjunct Appointments

Research

CORLESS, Robert (Western University), Professor, September 1, 2019 – June 30, 2023.

RICHTER, Bruce, Professor Emeritus, Dept. of Combinatorics and Optimization, September 1, 2019 – August 31, 2022.

STINSON, Douglas, Professor Emeritus, David R. Cheriton School of Computer Science, September 1, 2019 – June 30, 2025.

Adjunct Reappointments

Instructor

EMMS JONES, Sandra, Lecturer, Office of the Dean, January 1, 2020 – December 31, 2020.

MAHMOUD, Mohmmad, Lecturer, Office of the Dean, September 1, 2019 – December 31, 2019.

TOSH, Stephen, Lecturer, Office of the Dean, September 1, 2019 – December 31, 2019.

VENDER, Christine, Lecturer, Office of the Dean, October 21, 2019 – October 31, 2021.

Research

CHIU, Grace (Virginia Institute of Marine Science), Professor, Dept. of Statistics and Actuarial Science, October 1, 2019 – September 30, 2022.

RADJAVI, Heydar, Professor, Dept. of Pure Mathematics, September 1, 2019 – August 31, 2024.

Graduate Students appointed as Part-time Lecturers

THAMIZHAZHAGAN, Aasaimani, Dept. of Pure Mathematics, September 1, 2019 – December 31, 2019.

Graduate Students reappointed as Part-time Lecturers

CRAMER, Zachery, Dept. of Pure Mathematics, September 1, 2019 – December 31, 2019.

DWIVEDI, Shubham, Dept. of Pure Mathematics, September 1, 2019 – December 31, 2019.

HOSSAIN, Ehsaan, Dept. of Pure Mathematics, September 1, 2019 – December 31, 2019.

NASSERDEN, Brett, Dept. of Pure Mathematics, September 1, 2019 – December 31, 2019.

Postdoctoral Fellows appointed as Part-time Lecturers

MAZAHERI KALAHRODY, Mohammad Hossein, David R. Cheriton School of Computer Science, November 1, 2019 – October 31, 2020.

ZHANG, Xiaohong, Dept. of Combinatorics & Optimization, September 12, 2019 – September 11, 2020.

Postdoctoral Fellow reappointed as part-time Lecturers

A.1 Change in Appointment

WEI, Pengyu, Assistant Professor, Dept. of Statistics and Actuarial Science, (*ref. Dean's Report, April, 2019*)

From: September 1, 2019 – June 30, 2022

To: October 1, 2019 – June 30, 2023

B. ADMINISTRATIVE APPOINTMENTS

BOUDREAU, Christian, Dept. of Statistics and Actuarial Science, Co-Director, Survey Research Centre, July 1, 2019 – June 30, 2020.

CHENOURI, Shoja, Dept. of Statistics and Actuarial Science, Associate Chair, Graduate Studies, July 1, 2019 – June 30, 2022.

SAKHNINI, Victoria, David R. Cheriton School of Computer Science, Associate Director of Software Engineering, May 1, 2019 – June 30, 2021.

WENG, Chengguo, Dept. of Statistics and Actuarial Science, Associate Chair, Actuarial Science, July 1, 2019 – June 30, 2022.

C. SABBATICALS (for approval by the Board of Governors)

KENNEDY, Matthew, Associate Professor, Dept. of Pure Mathematics, January 1, 2020 – December 31, 2020, with 85% salary.

MARCOUX, Laurent, Professor, Dept. of Pure Mathematics, January 1, 2020 – June 30, 2020, with 85% salary. This is an early sabbatical.

RADGE, Prabhakar, Professor, David R. Cheriton School of Computer Science, January 1, 2020 – June 30, 2020, with 85% salary. This is an early sabbatical.

VOGEL, Daniel, Associate Professor, David R. Cheriton School of Computer Science, September 1, 2020 – August 31, 2021, with 96.1% salary.

WALLACE, Michael, Assistant Professor, Dept. of Statistics and Actuarial Science, January 1, 2020 – June 30, 2020, with 100%. This is an early special sabbatical.

A handwritten signature in black ink, reading "Stephen Watt". The signature is written in a cursive style with a large, stylized "W" at the end.

Stephen M. Watt
Dean

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF SCIENCE TO SENATE
October 21, 2019

For information:

A. APPOINTMENTS

Probationary Term

ISLAM, Kazi Rajibul, Assistant Professor, Department of Physics and Astronomy, July 1, 2020 to June 30, 2023. [B.Sc., (Physics), Jadavpur University (2005); M.Sc., (Physics), Tata Institute of Fundamental Research (2007); Ph.D., (Physics), University of Maryland (2012).]

Definite Term Reappointment – Full-Time

STEELMAN, Colby, Lecturer, Department of Earth and Environmental Science, September 1, 2019 to August 30, 2021.

Adjunct Appointments

Research

BOJKO, Barbara, Associate Professor, Department of Chemistry, September 1, 2019 to August 31, 2022.

Graduate Supervision and Research

O’LEARY, Stephen, Assistant Professor, Department of Biology, July 1, 2019 to June 30, 2022.

Adjunct Reappointments

Graduate Supervision

ARHONDITSIS, George B., Professor, Department of Earth and Environmental Sciences, April 1, 2019 to March 31, 2022.

Research and Other

LI, Hui, Professor, Department of Chemistry, September 1, 2019 to August 31, 2022.

Undergraduate Instruction and Research

ZIEGLER, Blake, Assistant Professor, School of Pharmacy, September 1, 2019 to August 31, 2022.

Cross Appointment

SCHIFF, Sherry, Professor, Department of Earth and Environmental Sciences cross appointed to Department of Chemistry, September 1, 2019 to August 31, 2022.

Cross Reappointment

BAUGH, Jonathan, Associate Professor, Department of Chemistry cross appointed to Department of Physics and Astronomy, September 1, 2019 to August 31, 2022.

Change in Appointment

STANBERRY, Andre, Clinic Director, School of Optometry and Vision Science, end date changed from April 30, 2022 to August 11, 2019.

Special Appointment**Postdoctoral Fellow Appointed as Part-time Lecturer**

LIU, Ying Ying, Lecturer, Department of Earth and Environmental Sciences, November 1, 2019 to December 31, 2019.

Special Reappointment**Undergraduate Instruction**

PACEY, Dean, Lecturer, School of Pharmacy, September 1, 2019 to December 31, 2019.

VARIKOOTY, Jalaiah, Lecturer, School of Optometry and Vision Science, September 1, 2019 to December 31, 2019.

B. ADMINISTRATIVE APPOINTMENT

BASU, Nandita, Director, Collaborative Water Program (Water Institute), January 1, 2020 to December 31, 2021.

LABRECHE, Tammy, Clinic Director, School of Optometry and Vision Science, August 12, 2019 to December 31, 2019.

FOR APPROVAL BY THE BOARD OF GOVERNORS**C. SABBATICAL**

GAUTHIER, Mario, Professor, Department of Chemistry, Early Sabbatical, January 1, 2020 to June 30, 2020, 85% salary arrangements.

LEE, Sonny, Associate Professor, Department of Chemistry, January 1, 2020 to December 31, 2020, 87.8% salary arrangements.

NEUFELD, Josh, Professor, Department of Biology, Early Sabbatical, January 1, 2020 to June 30, 2020, 85% salary arrangements.



R.P. Lemieux
Dean

REPORT OF ST. JEROME'S UNIVERSITY TO SENATE
October 21, 2019

FOR INFORMATION

A. APPOINTMENTS

Probationary Term Appointments

BRABAZON, Honor (BA 2005, Trinity College, University of Toronto; MA 2007, York University; PhD 2015, University of Oxford), Assistant Professor, Department of Sociology and Legal Studies, July 1, 2019, to June 30, 2022. Dr. Brabazon's research is centrally concerned with the role of law in constructing and enabling relations of power and with the various ways in which global justice movements engage the law in their attempts to navigate and challenge those power relations. As such, her research falls within the areas of international law and global justice and political/social theory and law. She has experience teaching core legal studies and criminology courses, from Introduction to Sociolegal Studies to Policing.

TATARYN, Anastasia (BA 2005, University of Saskatchewan; MA 2008, York University; LLM 2009, Osgoode Hall Law School, York University; PhD 2014, University of London, Birkbeck), Assistant Professor, Department of Sociology and Legal Studies, January 1, 2020, to June 30, 2023. Dr. Tataryn's research expertise and interests are in labour/employment law, migration, post-conflict transformation, and concepts of community and sociality in law. Her work is interdisciplinary and grounded in legal philosophy, decoloniality, and critical approaches to law. She has taught a range of subjects including labour/employment law, criminal law, jurisprudence, and legal theory.

Definite Term Appointments

CAUCHI-SANTORO, Roberta, Lecturer, Department of Italian and French Studies, September 1, 2019, to August 31, 2020.

DE SANTIS, Carm, Lecturer, Department of Sexuality, Marriage, and Family Studies, May 1, 2019, to April 30, 2021.

Definite Term Reappointments

DEMAN, Andrew, Lecturer, Department of English, September 1, 2019, to August 31, 2020.

KOMORNICKA, Jolanta, Assistant Professor, Department of History, July 1, 2019, to June 30, 2020.

SPIELMACHER, Mark, Lecturer, Department of English, September 1, 2019, to August 31, 2020.

STUMPF, Andrew, Assistant Professor, Department of Philosophy/Master of Catholic Thought Program, September 1, 2019, to August 31, 2020.

TERZIAN, Sylvia, Lecturer, Department of English, September 1, 2019, to August 31, 2020.

Contract Academic Staff Appointments – Instruction

AFROS, Elena, Department of English, September 1, 2019, to April 30, 2020.

BRIGGS, Catherine, Department of History, September 1, 2019, to December 31, 2019.

BURROWS, Kevin, Department of Sociology and Legal Studies, September 1, 2019, to April 30, 2020.

CELESTINI, Carmen, Department of Religious Studies, September 1, 2019, to April 30, 2020.

CHALLEN, Paul, Department of English, September 1, 2019, to December 31, 2019.

DEVITT, Ryan, Department of English, September 1, 2019, to April 30, 2020.

DUCHESNE, Scott, Department of English, September 1, 2019, to December 31, 2019.

GLEBE, Deborah, Department of Psychology, September 1, 2019, to April 30, 2020.

GREENWOOD, John, Human Sciences Program, January 1, 2020, to April 30, 2020.

HUTCHISON, Jesse, Department of English, September 1, 2019, to December 31, 2019.

HUTTER, Daniel, Department of History, September 1, 2019, to April 30, 2020.

JACOBS, Stacey, Department of Sexuality, Marriage, and Family Studies, September 1, 2019, to April 30, 2020.

JANG, Lauri, Arts First Program, September 1, 2019, to April 30, 2020.

LEROUX-DEMIR, Carlie, Department of Sociology and Legal Studies, September 1, 2019, to April 30, 2020.

LOBB, Diana, Department of English, September 1, 2019, to December 31, 2019.

NICASO, Antonio, Department of Italian and French Studies, September 1, 2019, to December 31, 2019.

NIXON, Kevin, Department of Sexuality, Marriage, and Family Studies, September 1, 2019, to December 31, 2019.

PAZZANO, Joseph, Department of Sexuality, Marriage, and Family Studies, September 1, 2019, to December 31, 2019.

QUINN-NILAS, Christopher, Department of Sexuality, Marriage, and Family Studies, January 1, 2020, to April 30, 2020.

SANGALLI, Yuri, Department of Italian and French Studies, September 1, 2019, to April 30, 2020.

SHOKIROVA, Takhmina, Department of Sexuality, Marriage, and Family Studies, September 1, 2019, to December 31, 2019.

TACON, Claire, Department of English, September 1, 2019, to April 30, 2020.

TATARYN, Myroslaw, Department of Religious Studies, January 1, 2020, to April 30, 2020.

TRUCHAN-TATARYN, Maria, Department of Religious Studies, January 1, 2020, to April 30, 2020.

UNDERHILL, Angela, Department of Sexuality, Marriage, and Family Studies, January 1, 2020, to April 30, 2020.

WATSON, Patrick, Department of Sociology and Legal Studies, September 1, 2019, to April 30, 2020.

WHITNEY-BROWN, Carolyn, Department of Religious Studies, September 1, 2018, to April 30, 2020.

WOOD, Jessica, Department of Psychology, January 1, 2020, to April 30, 2020.

ZINAIĆ, Rade, Department of Sociology and Legal Studies/Arts First Program, September 1, 2019, to April 30, 2020.

B. ADMINISTRATIVE APPOINTMENTS

BEDNARSKI, Steven, Co-Director, Medieval Studies Program, July 1, 2019, to June 30, 2022.

BONNER, Kieran, Acting Chair, Department of Sociology and Legal Studies, July 1, 2019, to June 30, 2020.

KLASSEN, Norm, Acting Chair, Department of Religious Studies, July 1, 2019, to June 30, 2020.

SERAFINI, Toni, Chair, Department of Sexuality, Marriage, and Family Studies, July 1, 2019, to June 30, 2022.

STUMPF, Andrew, Acting Director, Master of Catholic Thought Program, September 1, 2019, to August 31, 2020.

TREMBLAY, Bruno, Chair, Department of Philosophy, July 1, 2019, to June 30, 2022.

C. RESIGNATION

LACKENBAUER, P. Whitney, Professor, Department of History, July 1, 2019.

D. SABBATICALS

AUSTEN, Veronica, Associate Professor, Department of English, July 1, 2019, to December 31, 2019.

BROPHY, Susan, Associate Professor, Department of Sociology and Legal Studies, January 1, 2020, to June 30, 2020.

KLASSEN, Norm, Associate Professor, Department of English, July 1, 2020, to June 30, 2021.

KOLENTSIS, Alysia, Associate Professor, Department of English, January 1, 2020, to June 30, 2020.

TREMBLAY, Bruno, Associate Professor, Department of Philosophy, January 1, 2020, to June 30, 2020.

WHITEHEAD, Denise, Assistant Professor, Department of Sexuality, Marriage, and Family Studies, July 1, 2019, to December 31, 2019. [Deferred]



Cristina Vanin
Acting Dean, St. Jerome's University

University of Waterloo
SENATE
21 October 2019

FOR APPROVAL

Committee Appointments

Motion: To approve the following appointment:

- **Graduate & Research Council:** David Billedeau as graduate student representative for Environment, replacing Alexander Mercado, 1 October 2019 to 30 April 2020.

University of Waterloo
SENATE EXECUTIVE COMMITTEE
REPORT TO SENATE
21 October 2019

Changes are proposed to Senate Bylaw 3 to coordinate the bylaw with the Waterloo Undergraduate Student Association's Elections and Referenda Procedure. Undergraduate student candidates in Senate elections are now required to follow WUSA campaign spending limits as stipulated in the Elections and Referenda Procedure.

In addition, "Federation of Students" has been updated to "Waterloo Undergraduate Student Association."

Thus, it is proposed that Senate Bylaw 3 be revised as provided below. In accordance with Senate Bylaw 1, section 14.01*, the bylaw changes are recommended to Senate for first reading at the 21 October 2019 meeting.

FOR APPROVAL

Motion: That Senate receive the proposed bylaw changes for first reading at its 21 October 2019 meeting.

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

Feridun Hamdullahpur
President

Senate Bylaw 3

A bylaw relating to the selection of members of Senate of the University of Waterloo.

BE IT ENACTED as a bylaw of the University of Waterloo, as follows:

1. Chief Returning Officer

- 1.01 The university secretary or designate shall act as chief returning officer for the purpose of conducting the election of members of Senate. As chief returning officer, the university secretary or designate has overall responsibility for the general conduct of such elections and by-elections, which shall be by secret ballot. Without restricting the generality of the foregoing, the chief returning officer shall:
- Establish the timing of Senate elections and by-elections, subject to the provisions described in sections 2.01 and 2.03 below.
 - Call for nominations and when doing so inform the university community of the names of those members of Senate whose terms of office expire on 30 April of that year and whether such members are eligible for a further term of service.
 - Verify the eligibility of nominees and nominators.
 - For undergraduate student elections, provide nomination information to the ~~Federation of Students~~Waterloo Undergraduate Student Association Election Committee.
 - Distribute ballots and balloting information to eligible voters, allowing at least one week for the polling period.
 - Announce the results to the university community, and resolve ties, as necessary.

2. Elections

- 2.01 **Elections**
- The election of faculty and student members to Senate shall be completed by the regular March meeting of Senate each year. Undergraduate student elections shall be held in conjunction with the annual elections conducted by the ~~Federation of Students~~Waterloo Undergraduate Student Association in February. Faculty and graduate student elections are conducted by the Secretariat.
- The nomination period for faculty constituencies and graduate students is at least twenty-one (21) days. For undergraduate student constituencies, the nomination period is determined in consultation with the ~~Federation of Students~~Waterloo Undergraduate Student Association. The chief returning officer shall call for nominations from those faculty and student constituencies that have members whose terms are expiring by placing a suitable notice in such places and ways as may be designated from time to time by Senate, with copies to the appropriate faculties and constituency presidents. Nomination forms shall be made available by the Secretariat. Nominations shall be submitted in writing to the chief returning officer. Each nomination shall be signed by the required number of members of the constituency from which the member is to be elected and shall include a signed statement from the nominee agreeing to serve if elected. For faculty and graduate students, the required number of members is five; for undergraduate students elected from a single faculty, the required number is twenty-five; for undergraduate students elected at large, the required number is one hundred.

	<p>Undergraduate student nominees, or their representatives, shall attend an all candidates' mandatory meeting held by the Federation of Students <u>Waterloo Undergraduate Student Association</u>. The chief returning officer, or designate, shall also be present.</p> <p>For faculty and graduate student elections, the chief returning officer shall publish the candidates' statements in such places and ways as may be designated from time to time by Senate.</p>
2.02	<p>Campaigning/Voter Eligibility</p> <p>Public campaigning shall not take place before the close of nominations. For faculty and graduate student elections, nominees are to provide a brief statement (100 words maximum) to appear with the ballot.</p> <p>The Federation of Students <u>Waterloo Undergraduate Student Association</u> election rules <u>as described in the Association's Elections and Referenda Procedure</u> regulating campaigning for undergraduate student elections, except for including spending limits, shall be followed. The Federation of Students <u>Waterloo Undergraduate Student Association</u> Election Committee decisions may be appealed to the university secretary, who shall act as chief returning officer, and whose decision is final.</p> <p>The campaign spending limit for undergraduate students shall be: up to \$100 for constituency seats and \$200 for at large seats, with all campaign costs to be borne by the candidate.</p> <p>In a faculty constituency, all faculty members who hold a regular faculty appointment in that constituency are eligible to vote. In a graduate student constituency, all full-time and part-time graduate students registered in a degree program in that constituency are eligible to vote. In an undergraduate student constituency, all full-time students registered in a degree program in that constituency are eligible to vote; this includes students whose academic programs require a prolonged absence from campus such as a co-op work term or an approved study term abroad.</p>
2.03	<p>By-Elections</p> <p>The university secretary shall declare a Senate seat vacant: upon receipt of a written resignation from a member of Senate. when a member of Senate ceases to be eligible to represent the constituency that elected the member, for example when a faculty member ceases to hold a regular faculty appointment, or when a student graduates or otherwise ceases to be registered in the constituency that elected the student.¹</p> <p>If, within any year, a member of the Senate or any of its committees or councils, not having been granted permission to be absent by such body, attends less than 50 per cent of the regular meetings of such body, the member's office shall be by that very fact considered to be vacated and a confirmatory resolution shall be passed by Senate declaring the membership vacant. The Senate or its committee or council may grant such permission to members who are going on an approved sabbatical, on a co-op term, or any similar such absence related to the members' employment and/or educational program.</p> <p>Subject to the provisions noted below, the chief returning officer shall call by-elections to fill vacancies as soon as feasible and shall place a suitable notice in such places and ways as may be designated from time to time by Senate, with copies to the appropriate faculties and constituency presidents. Nominations shall remain open for at least one week and shall be submitted in writing to the chief returning officer. Each nomination shall be signed by the required number of members of the constituency from which the member is to be elected; and shall include a signed statement from the nominee agreeing to serve if elected. For faculty and graduate students, the required number of members is five; for undergraduate students elected from a single faculty, the required number is twenty-five; for undergraduate students elected at large, the required number is one hundred.</p>

When a seat is vacant because of the failure of a constituency to nominate any candidate to contest an election or by-election, that seat shall remain vacant until the next annual election, unless a petition [available from the Secretariat] requesting a by-election signed by the required number of members of the constituency concerned is received by the chief returning officer.

When a seat becomes vacant within three months of the end of the term for that seat, no by-election shall be called to fill the vacancy for the balance of the term.

No by-election shall be called or held in any constituency between 1 July and 15 September. In addition, no by-election shall be held in any undergraduate constituency between 1 April and 1 July.

3. Alumni representation

- 3.01 Each year the Alumni Council shall recommend the names of individual(s) for appointment to Senate. The university secretary shall be informed of such recommendations as they are made and shall so inform Senate.

4. Board of Governors Representation

- 4.01 Each year the university secretary shall request the Board of Governors to elect from among its community-at-large members as many as four individuals to serve as members of Senate pursuant to paragraph 18(b)(1) of *The University of Waterloo Act, 1972*. The university secretary shall be informed of the results of such election promptly following its completion, and shall so inform Senate.

Approved by Senate 15 June 1972.

Amended by Senate January 1973.

Amended by Senate April 1973.

Amended by Senate June 1975.

Amended by Senate in two readings, September and October 1975.

Amended by Senate in two readings, November and December 1982.

Amended by Senate in two readings, January and February 1983.

Amended by Senate in two readings, December 1984 and January 1985.

Amended by Senate in two readings, December 1989 and January 1990.

Amended by Senate in two readings, October and November 1990.

Amended by Senate in two readings, November and December 1991.

Amended by Senate September 1995.

Amended by Senate September 1999.

Amended by Senate in two readings, October and November 2013.

Amended from Bylaw 5 by Senate in two readings, September and October 2014.

Amended by Senate in two readings, January and February 2016.

Amended by Senate in two readings, November 2017 and January 2018.

¹See *The University of Waterloo Act*, section 25, for instances when graduating students may be exempt.

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
and
SENATE UNDERGRADUATE COUNCIL
Report to Senate
21 October 2019

Senate Graduate & Research Council (SGRC) met on 9 September 2019 and Senate Undergraduate Council (SUC) met on 10 September 2019. Both councils considered academic calendar dates for 2020-2021, as well as calendar guidelines for establishing academic dates and agreed to forward this item to Senate for approval as part of the regular agenda.

Further details are available at:

<https://uwaterloo.ca/secretariat/committees-and-councils/senate-undergraduate-council>

<https://uwaterloo.ca/secretariat/committees-and-councils/senate-graduate-research-council>

FOR APPROVAL

ACADEMIC CALENDAR DATES 2020-2021

1. **Motion:** To approve the 2020-2021 calendar dates and calendar guidelines for establishing academic dates as presented in Attachment 1.

Rationale: The dates lay out major academic milestones throughout the year and provide guidance to units throughout the campus community as they conduct academic planning within their respective areas.

By introducing a Fall Reading Week (12-16 October 2020), and because the term will not begin until 8 September 2020, then the fall 2020 final examination period will be impacted as follows: (1) the number of pre-examination study days had to be reduced to one (vs. the usual 2) in order to ensure the number of required teaching days, and (2) a Sunday (i.e., 13 December 2020) was added to the examination period.

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

Charmaine Dean
Vice President,
University Research

David DeVidi
Associate Vice-President, Academic

Academic Calendar Dates, 2020/21

	Fall 2020	Winter 2021	Spring 2021
Co-operative Work Term Begins	Sept. 8 (T)	Jan. 4 (M)	May 3 (M)
Classes Begin	Sept. 8 (T)	Jan. 5 (T)	May 3 (M)
Holidays	Oct. 12 (M)	Feb. 15 (M) Apr. 2 (F)	May 24 (M) July 1 (R) Aug. 2 (M)
Reading Week	Oct. 12-16 (M-F)	Feb. 15-19 (M-F)	N/A
Convocation	Oct. 23, 24 (F,S)	N/A	June 15-19 (T-S)
Classes End	Dec. 7 (M)	Apr. 6 (T)	July 27 (T)
Make-up Day(s) for in-term holidays	N/A	April 5 (M) for Jan 4 (M) April 6 (T) for Apr 2 (F schedule)	July 26 (M) for May 24 (M) July 27 (T) for July 1 (R schedule)
Pre-Examination Study Day(s)	Dec. 8 (T)	Apr. 7,8 (W,R)	July 28,29 (W,R)
Examinations Begin	Dec. 9 (W)	Apr. 9 (F)	July 30 (F)
Online Class Examination Days	Dec. 11,12 (F,S)	Apr. 9,10 (F,S)	Aug. 6,7 (F,S)
Examinations on Sunday	Dec. 13 (U)	N/A	N/A
Examinations End (including Emergency Day)	Dec. 23 (W)	Apr. 24 (S)	Aug. 14 (S)
Co-operative Work Term Ends	Dec. 23 (W)	Apr. 23 (F)	Aug. 20 (F)
Teaching days	60	60	60
Pre-examination Study Day(s)	1	2	2
Examination days	13 (+1 Emergency Day)	13 (+1 Emergency Day)	11 (+1 Emergency Day)

Symbols and abbreviations:

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

Guidelines for Determining Academic Calendar of Dates

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

1. That the practice of setting dates for each academic year continues to be an annual exercise.
2. That there be no fewer than 60 teaching days (12 weeks) in a term. A clear rationale for fewer than 60 teaching days must be communicated to Senate at the time calendar dates are approved. In calculating teaching days in a term, Saturdays, Sundays, and statutory or University holidays are excluded.
3. That attention be given to balancing the number of meets in courses. Where an imbalance may occur because of statutory holidays, the class schedule for a day different than the calendar day can be used to balance the number of course meets.
4. That Fall Convocation be the Friday and Saturday that fall in the third full week (beginning Sunday) of October.
5. That Spring Convocation be the Tuesday to Saturday in the second full week (beginning Sunday) in June.
6. That the Reading Weeks occur in all Faculties and must begin on the Tuesday following Thanksgiving in October and the Tuesday following Family Day in February.
7. That Fall Term classes in September begin on the Wednesday following the Labour Day holiday.
Exception: The Fall Term begins on Tuesday, September 8th when Labour Day is September 7th.
8. That the start date for Winter Term be set as follows:
 - If January 1st is a Sunday, then start of classes is Wednesday, January 4th.
 - If January 1st is a Monday, then start of classes is Wednesday, January 3rd.
 - If January 1st is a Tuesday, then start of classes is Monday, January 7th.
 - If January 1st is a Wednesday, then start of classes is Monday, January 6th.
 - If January 1st is a Thursday, then start of classes is Monday, January 5th.
 - If January 1st is a Friday, then start of classes is Tuesday, January 5th.
 - If January 1st is a Saturday, then start of classes is Wednesday, January 5th.
9. The start date for Spring Term be set as follows:
 - If May 1st is a Sunday, then start of classes is Monday, May 2nd.
 - If May 1st is a Monday, then start of classes is Monday, May 1st.
 - If May 1st is a Tuesday, then start of classes is Tuesday, May 1st.
 - If May 1st is a Wednesday, then start of classes is Wednesday, May 1st.
 - If May 1st is a Thursday, then start of classes is Monday, May 5th.
 - If May 1st is a Friday, then start of classes is Monday, May 4th.
 - If May 1st is a Saturday, then start of classes is Monday, May 3rd.
10. That there be no fewer than one pre-examination study day and when possible, two pre-examination study days (excluding Saturday, Sunday, and holidays) between the end of classes and the beginning of examinations. A clear rationale for using fewer than 2 days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

11. That there be no fewer than 13 examination days in the Fall and Winter Terms, and 11 examination days in the Spring Term. In addition, one Emergency Day with no scheduled examinations is added to the end of the examination period.
12. In calculating examination days, Saturdays which fall within the period are included, whereas Sundays and statutory or University holidays are excluded.
Exceptions:
Examinations will not be scheduled on the Saturday following Good Friday when that day falls within the examination schedule or the Saturday of the Civic Day weekend.
The first Sunday within the examination period may be used when required to accommodate the prescribed number of examination days in the Fall Term.
13. That in the Fall Term no examinations be scheduled beyond December 22nd. The Emergency Day cannot be scheduled beyond December 23rd.
14. That Online Course Examination Days in each term be the first consecutive Friday and Saturday in the examination period.
15. Grades due dates for on campus courses are normally scheduled seven days from the date of the final examination. Grades for Online (Centre for Extended Learning) courses that have a scheduled final examination are due on the last day of the grades submission period. Grades for all courses without a scheduled final examination are normally due 14 days after the start of examinations.
16. Co-op work terms are expected to be 16 week in duration. Actual start and end dates may vary depending on employer or student requirements in consultation with Co-operative Education.

Prepared by:
C. Newell Kelly, Registrar
June, 2019

Rationale for Exceptions:

Rule 10

... A clear rationale for using fewer than 2 days or Saturday, Sunday, and holidays as pre-examination study days, must be communicated to Senate at the time calendar dates are approved.

Rule 12

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

Rationale: By introducing a Fall Reading Week (October 12-16), and also because the term does not begin until September 8th, the number of study days had to be reduced to one day in order to ensure the number of required teaching days. A Sunday was also added to the examination period.

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
Report to Senate
21 October 2019

Senate Graduate & Research Council met on 9 September 2019 and agreed 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

PROGRAM CHANGE

Faculty of Applied Health Sciences

1. **Motion:** To approve the creation of six fields in the MSc program in the School of Public Health and Health systems, effective 1 January 2020, as presented at Attachment 1.

Rationale: The School of Public Health and Health Systems is diverse and highly multi-disciplinary. The six fields are proposed to recognize existing areas of strength within the graduate programs. Fields will allow MSc students to appropriately represent their academic and research focus to both academic and professional audiences. These study path options stitch together already existing courses and milestones into a comprehensive learning experience for students who wish to not only receive an MSc but also benefit from a certain level of course and research concentration.

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

Charmaine Dean
Vice President, Research & International

MEMORANDUM

TO: Kathy Winter, Secretary, Senate Graduate and Research Council

FROM: Julie Cassaubon on behalf of Tracy Taves, Faculty Graduate Administrator, Applied Health Sciences

cc: Rhona Hanning, Associate Dean, Graduate Studies

DATE: June 19, 2019

SUBJECT: **Applied Health Sciences Faculty Graduate Studies Committee (FGSC) Report to Senate Graduate and Research Council**

The attached report regarding the six fields in the MSc program in the School of Public Health and Health systems (effective January 2020) were approved by the Applied Health Sciences Faculty Council on April 22, 2019 and is being forwarded to Senate Graduate & Research Council. Would you please place it on the agenda for the September 9, 2019 Senate Graduate & Research Council meeting.

Thank you!

1. ACADEMIC PLAN CHANGES

1.1 School of Public Health and Health Systems* effective January 2020

1.1.1 To create six Fields in the MSc program in **The School of Public Health and Health Systems effective January 2020:**

The School proposes to launch the following six course-based fields in January 2020:

- a) **Epidemiology and Biostatistics**
- b) **Health Evaluation**
- c) **Health Informatics**
- d) **Health and Environment**
- e) **Global Health**
- f) **Aging and Health**

Rationale: The School of Public Health and Health Systems is diverse and highly multi-disciplinary. The six fields are proposed to recognize existing areas of strength within the graduate programs. Fields will allow MSc students to appropriately represent their academic and research focus to both academic and professional audiences. These study path options stitch together already existing courses and milestones into a comprehensive learning experience for students who wish to not only receive an MSc but also benefit from a certain level of course and research concentration.

*separate attachments

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

Faculty: Applied Health Sciences

Program: Master of Science (MSc) in Public Health and Health Systems

Program contact name(s): Ellen MacEachen

Form completed by: Ellen MacEachen

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Course/Milestone-New/Revision/Inactivation form ([PC docx version](#) or [MAC docx version](#)).

Update of MSc degree requirements to include 6 new Graduate Research Fields.

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

Rationale for change(s):

The proposed Graduate Research Fields will add structure to the MSc program by allowing students to demonstrate depth of knowledge in certain areas of study and receive recognition for that Graduate Research Field from the School, which is highly valued when searching for a job in industry. These study path options stitch together already existing courses into a comprehensive learning experience for students who wish to, not only receive a thesis based Masters, but also benefit from a certain level of focus in their course selection.

Proposed effective date: Term: Winter Year: 2020

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/applied-health-sciences/school-public-health-and-health-systems/master-science-msc-public-health-and-health-systems>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Graduate research fields Fields (areas of research)</p> <ul style="list-style-type: none"> • Population Health <p>Program information</p> <ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall 	<p>Graduate research fields</p> <ul style="list-style-type: none"> • Epidemiology and Biostatistics • Health Evaluation • Health Informatics • Health and Environment • Global Health • Aging and Health

- Delivery mode
 - On-campus
- Program type
 - Master's
 - Research
- Registration option(s)
 - Full-time
 - Part-time
- Study option(s)
 - [Thesis](#)

Admission requirements

- Minimum requirements
 - Successful completion of a four-year Honours Bachelor's degree (or equivalent) with a minimum 75% average. The Bachelor's degree will normally be in the biological sciences, behavioural health, health, public health, or social sciences.
 - Undergraduate experience including coursework in one or more of the behavioural, biological, developmental, health, or social sciences is advantageous, given the multidisciplinary nature of the program. Students should also have a suitable background in research design and statistics to meet prerequisite standards for all graduate level courses.
 - Students may be allowed to transfer into the PhD program directly from the SPHHS Master's programs. Such students must have completed all Master's coursework requirements, have demonstrated a superior academic record, and have evidence of prior research achievements (e.g., adjudicated research report, significant documented contribution as a co-author to a peer-reviewed publication, first author peer-reviewed publication).
- Application materials
 - Curriculum vitae
 - Supplementary information form
 - Indicating reasons for pursuing graduate studies (e.g., discuss how a graduate degree maps onto your career plans) and outlining research interests.
 - Transcript(s)
 - Writing sample
 - Students must submit a copy of previous academic work, such as a publication, term paper, or Honours thesis written during the

Program information

- Admit term(s)
 - Fall
- Delivery mode
 - On-campus
- Program type
 - Master's
 - Research
- Registration option(s)
 - Full-time
 - Part-time
- Study option(s)
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 - Successful completion of a four-year Honours Bachelor's degree (or equivalent) with a minimum 75% average. The Bachelor's degree will normally be in the biological sciences, behavioural health, health, public health, or social sciences.
 - Undergraduate experience including coursework in one or more of the behavioural, biological, developmental, health, or social sciences is advantageous, given the multidisciplinary nature of the program. Students should also have a suitable background in research design and statistics to meet prerequisite standards for all graduate level courses.
 - Students may be allowed to transfer into the PhD program directly from the SPHHS Master's programs. Such students must have completed all Master's coursework requirements, have demonstrated a superior academic record, and have evidence of prior research achievements (e.g., adjudicated research report, significant documented contribution as a co-author to a peer-reviewed publication, first author peer-reviewed publication).
- Application materials
 - Curriculum vitae
 - Supplementary information form
 - Indicating reasons for pursuing graduate studies (e.g., discuss how a graduate degree maps onto your career plans) and outlining research interests.
 - Transcript(s)
 - Writing sample

last two years of their undergraduate education.

- References
 - Number of references: 2
 - Type of references:

preferably from faculty members

- [English language proficiency \(ELP\)](#) (if applicable)

Degree requirements

Thesis option:

- [Graduate Academic Integrity Module \(Graduate AIM\)](#)
- Courses
 - The normal minimum requirement will be 5 one-term (0.50 unit weight) graduate courses (3 required and 2 free electives or approved equivalents):
 - Required courses:
 - [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
 - 2 of the following:
 - [HLTH 605 Regression Models](#) (or equivalent) or [HLTH 705 Advanced Statistical Methods for Analyzing Public Health and Health Systems Data](#)*
 - [AHS 600 Foundations of Qualitative Research Methodologies](#) (or equivalent) or [HLTH 704 Advanced Qualitative Methods for Health Research](#)*
 - [HLTH 606 Epidemiological Methods](#) (or equivalent) or [HLTH 706 Advanced Epidemiological Methods](#)*
 - [HLTH 619 Fundamental Research Methods in Health Informatics](#) (or equivalent) or [HLTH 719 Advanced Research Methods in Health Informatics](#)*
 - Elective courses:
 - 2 free elective courses, selected in consultation with the supervisor (may include courses outside SPHHS, or any courses

- Students must submit a copy of previous academic work, such as a publication, term paper, or Honours thesis written during the last two years of their undergraduate education.

- References
 - Number of references: 2
 - Type of references:

preferably from faculty members

- [English language proficiency \(ELP\)](#) (if applicable)

Degree requirements

Thesis option:

- [Graduate Academic Integrity Module \(Graduate AIM\)](#)
- Courses
 - The normal minimum requirement will be 5 one-term (0.50 unit weight) graduate courses (3 required and 2 free electives or approved equivalents):
 - Required courses:
 - [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
 - 2 of the following:
 - [HLTH 605 Regression Models](#) (or equivalent) or [HLTH 705 Advanced Statistical Methods for Analyzing Public Health and Health Systems Data](#)*
 - [HLTH 625 Foundations of Qualitative Research Methodologies](#) (or equivalent) or [HLTH 704 Advanced Qualitative Methods for Health Research](#)*
 - [HLTH 606 Epidemiological Methods](#) (or equivalent) or [HLTH 706 Advanced Epidemiological Methods](#)*
 - [HLTH 619 Fundamental Research Methods in Health Informatics](#) (or equivalent) or [HLTH 719 Advanced Research Methods in Health Informatics](#)*
 - Elective courses:
 - 2 free elective courses, selected in consultation with the supervisor (may include

<p>offered by SPHHS, including additional courses from the required list, online courses, etc.)</p> <ul style="list-style-type: none"> ▪ *It is highly recommended that MSc students with a strong background or previous training in one of these areas take the 700-level equivalent in place of the 600-level course requirement (e.g., those with a strong statistical background may opt to take HLTH 705). Such decisions should be made in collaboration with the supervisor. ○ At a minimum, students must obtain an average of 75% or higher in aggregate on the courses presented in fulfilment of the degree requirements. Grades on all courses presented to fulfill the degree requirements must be 70% or higher. A grade below 70% in any course or failing to maintain an average of 75% will necessitate a review of the student's status by the School and may result in a student being required to complete additional coursework or being required to withdraw from the program. The School reserves the right to stipulate additional coursework if it is necessary for the student's preparation. • Link(s) to courses <ul style="list-style-type: none"> ○ Health Studies (HLTH) courses ○ Graduate course search • Academic Integrity Workshop • Graduate Studies Seminar I <ul style="list-style-type: none"> ○ The Fall term segment of the seminar will provide a weekly opportunity for MSc students in their first term of study to attend research seminars led by SPHHS faculty members and senior graduate students. In addition, opportunities will be arranged for students to participate in workshops relating to research methods, presentation skills, grantsmanship, or to attend guest lectures delivered by scholars from outside SPHHS. • Graduate Studies Seminar II <ul style="list-style-type: none"> ○ The Winter term segment of the seminar will provide a weekly opportunity for MSc students in their second term of study to participate in a journal club led by 	<p>courses outside SPHHS, or any courses offered by SPHHS, including additional courses from the required list, online courses, etc.)</p> <ul style="list-style-type: none"> ▪ *It is highly recommended that MSc students with a strong background or previous training in one of these areas take the 700-level equivalent in place of the 600-level course requirement (e.g., those with a strong statistical background may opt to take HLTH 705). Such decisions should be made in collaboration with the supervisor. ○ At a minimum, students must obtain an average of 75% or higher in aggregate on the courses presented in fulfilment of the degree requirements. Grades on all courses presented to fulfill the degree requirements must be 70% or higher. A grade below 70% in any course or failing to maintain an average of 75% will necessitate a review of the student's status by the School and may result in a student being required to complete additional coursework or being required to withdraw from the program. The School reserves the right to stipulate additional coursework if it is necessary for the student's preparation. <p><u>Students in the SPHHS MSc program may also wish to pursue one of the following Graduate Research Fields:</u></p> <ol style="list-style-type: none"> 1. <u>Epidemiology and Biostatistics</u> 2. <u>Health Evaluation</u> 3. <u>Health Informatics</u> 4. <u>Health and Environment</u> 5. <u>Global Health</u> 6. <u>Aging and Health</u> <p><u>A Graduate Research Field is a University credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research and a set of courses that together provide an in-depth study in the area of the Graduate Research Field. A student will only obtain the Graduate Research Field on their transcript if they have completed the requirements associated with the MSc degree and the requirements associated with the Graduate Research Field.</u></p>
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members of their cohort. Each student will be responsible for selecting one article, providing an electronic copy to the instructors to allow for placement on the course website, and then leading discussion around the article's purpose, content, strengths, and limitations. In addition, students will be expected to read through the articles chosen by their colleagues, and actively participate in the discussion held each week.

- Master's Thesis

- For the Master's thesis, an approved topic is required and will be defended in an oral examination. The MSc thesis committee consists of a minimum of three faculty and includes the student's supervisor, appointed in the School, and at least one other member of the School of Public Health and Health Systems faculty. One committee member may be from outside the School (whether from within the university or from another university). The composition of the Thesis Advisory Committee must be approved by the School's Graduate Committee.

All MSc Graduate Research Fields in the School of Public Health and Health Systems (SPHHS) consist of Graduate Studies Seminars I and II, a Master's Thesis that is confirmed by the SPHHS to be in the chosen Graduate Research Field, and a set of 5 graduate (0.50 weight) level courses. This set of courses is comprised of a mix of required and elective courses. Required courses are those that are prescribed as part of the Graduate Research Field. Elective courses are those that are on a list of courses designated as electives for a given Graduate Research Field.

For any of the Graduate Research Fields below, a directed studies course (HLTH 620 or HLTH 720) focused on the Graduate Research Field may replace a required or elective course, with the approval of the Associate Director, Research Graduate Program, School of Public Health and Health Systems.

The course requirements for each of the Graduate Research Fields are described below.

1. Graduate Research Field in Epidemiology and Biostatistics

Students must successfully complete 3 required courses and 2 elective courses. An assessment of whether or not the student's thesis warrants the Epidemiology and Biostatistics Graduate Research Field designation will be completed by the SPHHS.

Required courses:

- [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
- [HLTH 605A Regression Methods](#)
- [HLTH 606A Epidemiological Methods](#)

Elective courses: select 2 from the following list:

- [HLTH 634 Environmental Epidemiology](#)
- [HLTH 672 Epidemiological Methods in Aging](#)
- [HLTH 705 Advanced Statistical Methods for Analyzing PHHS Data](#)
- [HLTH 706 Advanced Epidemiological Methods](#)

2. Graduate Research Field in Health Evaluation

Students must successfully complete 2 required courses and 3 elective courses. An assessment of whether or not the

student's thesis warrants the *Health Evaluation* Graduate Research Field designation will be completed by the SPHHS.

Required courses:

- [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
- [HLTH 655 Health Measurement and Survey Methods](#)

Elective courses:

Select 1 from the following list:

- [HLTH 605A Regression Methods or HLTH 656 Quantitative Methods and Analysis](#)
- [HLTH 625 Foundations of Qualitative Research Methodologies or HLTH 652 Qualitative Methods and Analysis](#)

Select 1 or 2 from the following list:

- [HLTH 614 Foundations of Program Evaluation](#)
- [HLTH 651 Theory and Applications in Program Evaluation](#)
- [HLTH 653 Evaluation Practice and Management](#)
- [HLTH 654 Systems Thinking and Analysis in Health Program Planning and Evaluation](#)

Select 1 from the following list, if only 1 course was selected from the category above:

- [HLTH 603 Health Policy](#)
- [HLTH 626 Analysis and Management of Health Information](#)
- [HLTH 620 Experiential Learning in Evaluation](#)

3. Graduate Research Field in Health Informatics

Students must successfully complete 2 required courses and 3 elective courses. An assessment of whether or not the student's thesis warrants the *Health Informatics* Graduate Research Field designation will be completed by the SPHHS.

Required courses:

- [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
- [HLTH 619 Fundamental Research Methods in Health Informatics](#)

Elective courses:

Select 1 from the following list:

- HLTH 605A Regression Methods OR HLTH 705 Advanced Statistical Methods for Analyzing Public Health and Health Systems Data
- HLTH 625 Foundations of Qualitative Research Methodologies or HLTH 652 Qualitative Methods and Analysis or HLTH 704 Advanced Qualitative Methods for Health Research
- HLTH 606A Epidemiological Methods or HLTH 706 Advanced Epidemiological Methods

Select 1 from the following list:

- HLTH 633 Digital Health
- HLTH 629 Information Visualization
- HLTH 626 Analysis and Management of Health Information in Aging Populations
- HLTH 615 Requirements Specification and Analysis in Health Systems
- HLTH 616 Decision Making and Systems Thinking in Health Informatics
- HLTH 637 Public Health Informatics

Select 1 from the following list:

- COGSCI 600 Cognitive Science
- SYDE 642 Cognitive Engineering Methods
- SYDE 644 Human Factors Testing
- CS 634 Security and Privacy for Health Systems
- CS 792 Data Structures and Standards in Health Informatics

4. Graduate Research Field in Health and Environment

Students must successfully complete 2 required courses and 3 elective courses. An assessment of whether or not the student's thesis warrants the *Health and Environment* Graduate Research Field designation will be completed by the SPHHS.

Required courses:

- [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
- HLTH 604 Public Health and the Environment

Elective courses:

Select 2 from the following list:

- HLTH 606A Epidemiological Methods
- HLTH 605A Regression Methods or HLTH 656 Quantitative Methods and Analysis

- [HLTH 625 Foundations of Qualitative Research Methodologies or HLTH 652 Qualitative Methods and Analysis](#)

Select 1 from the following list:

- [HLTH 623 Risk and Exposure Assessment in Public Health](#)
- [HLTH 624 Environmental Toxicology in Public Health](#)
- [HLTH 634 Environmental Epidemiology](#)
- [HLTH 631 Public Health Surveillance](#)
- [HLTH 661 GIS and Public Health](#)
- [HLTH 662 Global Health](#)

5. Graduate Research Field in Global Health

Students must successfully complete 2 required courses and 3 elective courses. An assessment of whether or not the student's thesis warrants the *Global Health* Graduate Research Field designation will be completed by the SPHHS.

Required courses:

- [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)
- [HLTH 662 Global Health](#)

Elective courses:

Select 2 from the following list:

- [HLTH 605A Regression Methods](#)
- [HLTH 606A Epidemiological Methods](#)
- [HLTH 625 Foundations of Qualitative Research Methodologies or HLTH 652 Qualitative Methods and Analysis](#)
- [HLTH 619 Fundamental Research Methods in Health Informatics](#)

Select 1 from the following list (these courses are global-health focused in all examples and assignments):

- [HLTH 632 Health Economics and Public Health](#)
- [HLTH 654 Systems Thinking and Analysis in Health Program Planning and Evaluation](#)

6. Graduate Research Field in Aging and Health

Students must successfully complete 1 required course and 4 elective courses. An assessment of whether or not the student's thesis warrants the *Aging and Health* Graduate Research Field designation will be completed by the SPHHS.

SGRC secretary note: According to GSPA, the text beginning with "required course" up to and including "hlth 626" is to be underlined in order to denote new content.

Required course:

- [HLTH 601 Lifespan Approaches to Disease Prevention and Health Promotion](#)

Elective courses:

Select 2 from the following list:

- [HLTH 625 Foundations of Qualitative Research Methodologies or HLTH 652 Qualitative Methods and Analysis](#)
- [HLTH 672: Epidemiologic Methods in Aging Research](#)
- [HLTH 605A Regression Methods](#)
- [HLTH 606A Epidemiological Methods](#)
- [HLTH 619 Fundamental Research Methods in Health Informatics](#)

Select 2 from the following list:

- [HLTH 642 Interdisciplinary Perspectives on Aging](#)
- [HLTH 627 Dementia Care](#)
- [HLTH 630 Geriatric Medicine](#)
- [HLTH 626 Analysis Management of Health Informatics in Aging Population](#)
- Link(s) to courses
 - [Health Studies \(HLTH\) courses](#)
 - [Graduate course search](#)
- Academic Integrity Workshop
- Graduate Studies Seminar I
 - The Fall term segment of the seminar will provide a weekly opportunity for MSc students in their first term of study to attend research seminars led by SPHHS faculty members and senior graduate students. In addition, opportunities will be arranged for students to participate in workshops relating to research methods, presentation skills, grantsmanship, or to attend guest lectures delivered by scholars from outside SPHHS.
- Graduate Studies Seminar II
 - The Winter term segment of the seminar will provide a weekly opportunity for MSc students in their second term of study to participate in a journal club led by members of their cohort. Each student will be responsible for selecting one article, providing an electronic copy to the instructors to allow for placement on the course website, and then leading discussion

	<p>around the article's purpose, content, strengths, and limitations. In addition, students will be expected to read through the articles chosen by their colleagues, and actively participate in the discussion held each week.</p> <ul style="list-style-type: none"> • Master's Thesis <ul style="list-style-type: none"> ○ For the Master's thesis, an approved topic is required and will be defended in an oral examination. The MSc thesis committee consists of a minimum of three faculty and includes the student's supervisor, appointed in the School, and at least one other member of the School of Public Health and Health Systems faculty. One committee member may be from outside the School (whether from within the university or from another university). The composition of the Thesis Advisory Committee must be approved by the School's Graduate Committee.
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How will students currently registered in the program be impacted by these changes?

Students who are already in the program will have the option to declare these Graduate Research Fields before graduation, if they have taken the required courses.

Departmental approval date (mm/dd/yy): 02/13/19

Reviewed by FGSC) date (mm/dd/yy): 03/07/19

University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Report to Senate
21 October 2019

Senate Undergraduate Council met on 10 September 2019 and agreed to forward the following items to Senate for approval in the regular agenda.

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

FOR APPROVAL

NEW ACADEMIC PLANS & RELATED INACTIVATIONS

Faculty of Applied Health Sciences
Department of Kinesiology

1. **Motion:** To approve the inactivation of the Rehabilitation Sciences Minor and creation of the new Rehabilitation Sciences Specialization as described below, effective 1 September 2020.

Specialization to be Created:

Rehabilitation Sciences Specialization

The Rehabilitation Sciences Specialization is open to Kinesiology students who wish to obtain some specialization in rehabilitation sciences.

The kinesiology program is well suited to prepare students for future study/practice in a wide variety of health professions (e.g., physical therapy, chiropractics, occupational therapy, athletic therapy, clinical kinesiology). Although the kinesiology core includes several rehabilitation science courses, the Rehabilitation Sciences Specialization is designed to provide additional elective courses in rehabilitation sciences to prepare students for success in post-degree study/practice in the health professions.

Requirements

1. Normally, a maximum of 2.0 units (four courses) obtained on a Letter of Permission Form or in transfer credit may be applied toward fulfilment of the Rehabilitation Sciences Specialization course requirements. These courses must be equivalent to courses listed in the course requirements (including any prerequisites) as assessed by the department offering the replaced course.
2. Successful completion of 4.0 units from the requirements listed below, with an overall average of 60%.

Legend

* KIN 431, KIN 432, KIN 433, KIN 472 must be on a rehabilitation sciences topic and approved in advance by the course instructor and associate chair, undergraduate studies.

1. Required courses (2.0 units):

KIN 312
KIN 340
KIN 407
KIN 422

2. Elective courses (2.0 units):

KIN 301
KIN 351
KIN 356
KIN 357
KIN 414
KIN 415
KIN 416
KIN 418
KIN 427
KIN 428
KIN 429
KIN 431*
KIN 432*
KIN 433* or KIN 472*
KIN 456
KIN 457
KIN 491
KIN 492A and KIN 492B

Minor to be Inactivated: See <http://ugradcalendar.uwaterloo.ca/page/AHS-Rehabilitation-Sciences-Minor>

Rationale:

To be consistent with the recent changes to University definitions of minors, options and specializations, the Department of Kinesiology is inactivating the Rehabilitation Sciences Minor (motion 3.1.1.) and adding a new Rehabilitation Sciences Specialization. The Rehabilitation Sciences Minor was only open to Kinesiology students as the required courses (KIN 340, 407, 414, 415, 422) included prerequisites that made it difficult for other students to access this Minor. The Rehabilitation Sciences Specialization is most appropriate for Kinesiology students only, and the list of required courses (KIN 312, 340, 407, 422) provides appropriate depth of knowledge for a specialization in rehabilitation sciences.

ACADEMIC PLAN CHANGES

Faculty of Science

Honour Biology, Environmental Biology Specialization (Reg. & Co-op) and Honours Environmental Science, Ecology Specialization (Reg. & Co-op)

2. **Motion:** To approve the proposed changes to the Honour Biology, Environmental Biology Specialization (Reg. & Co-op) and Honours Environmental Science, Ecology Specialization (Reg. & Co-op) as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Honour Biology, Environmental Biology Specialization (Reg. & Co-op)

Successful completion of this program requires:

21.5 units distributed as follows:

- ~~9.0~~ **9.5** BIOL units: [BIOL 110](#), [BIOL 120](#), [BIOL 130](#), [BIOL 130L](#), [BIOL 150](#), [BIOL 165](#), ([BIOL 211](#) or [BIOL 241](#)), [BIOL 239](#), [BIOL 240](#), [BIOL 240L](#), [BIOL 273](#), [BIOL 308](#), [BIOL 350](#), [BIOL 351](#), [BIOL 354](#), [BIOL 359](#), [BIOL 361](#), [BIOL 451](#), [BIOL 457](#), and [BIOL 458](#)

- 2.0 ~~1.5~~ BIOL units chosen from: [BIOL 312](#), [BIOL 321](#), [BIOL 323](#), [BIOL 325](#), [BIOL 335L](#), [BIOL 346](#), [BIOL 364](#), [BIOL 370](#), [BIOL 371](#), [BIOL 383](#), [BIOL 414](#), [BIOL 426](#), [BIOL 439](#), [BIOL 447](#), [BIOL 450](#), [BIOL 452](#), [BIOL 455](#), [BIOL 456](#), [BIOL 462](#), [BIOL 470](#), [BIOL 479](#), [BIOL 485](#), [BIOL 488](#), [BIOL 489](#), [BIOL 490A](#), [BIOL 490B](#), [BIOL 498A](#) and [BIOL 498B](#), or [BIOL 499A](#) and [BIOL 499B](#) with the following condition:
 - ~~1.5~~ 1.0 units must be at 400-level
- 0.5 BIOL unit [300-level or higher](#)
- 3.0 CHEM units: [CHEM 120](#), [CHEM 120L](#), [CHEM 123](#), [CHEM 123L](#), [CHEM 237](#), [CHEM 237L](#), [CHEM 266](#), and [CHEM 266L](#)
- 0.5 unit program elective chosen from: [MATH 114](#), [MATH 127](#), or [PHYS 111](#)
- 0.5 STAT unit: [STAT 202](#)
- 5.5 elective units
- 0.5 unit ENGL: [ENGL 193/SPCOM 193](#)

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Recommended Course Sequence

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Year 4 (Regular)

[BIOL 451](#), [BIOL 457](#), [BIOL 458](#)

~~Three~~ Two BIOL electives (~~1.5~~ 1.0 units) - *specific for Environmental Biology Specialization*

One BIOL elective 300-level or higher (0.5 unit)

Four electives (2.0 units)

Year 4 (Co-op)

Fall

[BIOL 451](#), [BIOL 458](#)

~~Two~~ One BIOL electives (~~1.0~~ 0.5 unit) - *specific for Environmental Biology Specialization*

Two electives (1.0 unit)

Winter

[BIOL 457](#)

One BIOL elective (0.5 unit) - *specific for Environmental Biology Specialization*

One BIOL elective 300-level or higher (0.5 unit)

Two electives (1.0 unit)

Honours Environmental Science, Ecology Specialization (Reg. & Co-op)

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Successful completion of this program requires:

21.25 units distributed as follows:

- ~~6.25~~ 6.75 BIOL units: [BIOL 110](#), [BIOL 120](#), [BIOL 150](#), [BIOL 165](#), [BIOL 239](#), [BIOL 240](#), [BIOL 240L](#), [BIOL 350](#), [BIOL 351](#), [BIOL 354](#), [BIOL 359](#), [BIOL 361](#), [BIOL 451](#), and [BIOL 457](#)
- 0.5 BIOL unit from: [BIOL 456](#) or [BIOL 458](#)
- 2.0 CHEM units: [CHEM 120](#), [CHEM 120L](#), [CHEM 123](#), [CHEM 123L](#), and [CHEM 266](#)
- 0.5 CHEM unit from: [CHEM 233](#) or [CHEM 237](#)

- 3.0 EARTH units: [EARTH 121](#), [EARTH 121L](#), [EARTH 122](#), [EARTH 122L](#), [EARTH 123](#), [EARTH 223](#), and [EARTH 342](#)
- 0.5 PHYS unit: [PHYS 111](#)
- ~~2.0~~ 1.5 BIOL units from: [BIOL 309](#), [BIOL 310](#), [BIOL 312](#), [BIOL 321](#), [BIOL 323](#), [BIOL 325](#), [BIOL 335L](#), [BIOL 346](#), [BIOL 370](#), [BIOL 371](#), [BIOL 383](#), [BIOL 414](#), [BIOL 426](#), [BIOL 439](#), [BIOL 447](#), [BIOL 448](#), [BIOL 450](#), [BIOL 452](#), [BIOL 455](#), [BIOL 461](#), [BIOL 462](#), [BIOL 470](#), [BIOL 479](#), [BIOL 485](#), [BIOL 488](#), [BIOL 489](#), [BIOL 490A](#), [BIOL 490B](#), [BIOL 490C](#), or [BIOL 499A](#) and [BIOL 499B](#) with the following condition:
 - 0.5 BIOL unit must be at 400-level
- 0.5 EARTH units from: [EARTH 321](#), [EARTH 333](#), [EARTH 358](#), [EARTH 421](#), [EARTH 440](#), [EARTH 458](#), or [EARTH 459](#)
- 0.5 BIOL or EARTH unit from: [BIOL 211](#), [BIOL 241](#), [BIOL 309](#), [BIOL 310](#), [BIOL 312](#), [BIOL 321](#), [BIOL 323](#), [BIOL 325](#), [BIOL 335L](#), [BIOL 346](#), [BIOL 370](#), [BIOL 371](#), [BIOL 383](#), [BIOL 414](#), [BIOL 426](#), [BIOL 439](#), [BIOL 447](#), [BIOL 448](#), [BIOL 450](#), [BIOL 452](#), [BIOL 455](#), [BIOL 461](#), [BIOL 462](#), [BIOL 470](#), [BIOL 479](#), [BIOL 485](#), [BIOL 488](#), [BIOL 489](#), [BIOL 490A](#), [BIOL 490B](#), [BIOL 490C](#), [BIOL 499A](#), and [BIOL 499B](#); [EARTH 221](#), [EARTH 232](#), [EARTH 235](#), [EARTH 238](#), [EARTH 281](#), [EARTH 321](#), [EARTH 333](#), [EARTH 358](#), [EARTH 421](#), [EARTH 440](#), [EARTH 458](#), or [EARTH 459](#)
- 0.5 ERS unit: [ERS 215](#)
- 0.5 MATH unit: [MATH 127](#)
- 0.5 STAT unit: [STAT 202](#)
- 0.5 ENGL unit: [ENGL 193/SPCOM 193](#)
- 3.5 elective lecture course units

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Year Four (Reg.)

Fall and Winter

BIOL 456 Population Biology or BIOL 458 Quantitative Ecology (Fall)

[BIOL 451 Advanced Ecology and Evolution](#) (fall)

BIOL 457 Analysis of Communities (~~W~~winter)

~~Three~~Two BIOL electives 300-level or higher (~~1.5~~ 1.0 units) - *specific for Ecology Specialization*

One EARTH elective 300-level or higher (0.5 unit) - *specific for the Ecology Specialization*

Four electives (2.0 units)

Year Four (Co-op)

Fall and Winter

[BIOL 456](#) Population Biology

or [BIOL 458](#) Quantitative Ecology (fall)

[BIOL 451 Advanced Ecology and Evolution](#) (fall)

[BIOL 457](#) Analysis of Communities (winter)

[ERS 215](#) Environmental and Sustainability Assessment I

~~Two~~One BIOL electives 300-level or higher (~~0.5 + 0~~ unit) - *specifically for Ecology Specialization*

One BIOL elective 400-level (0.5 unit) - *specifically for Ecology Specialization*

One EARTH elective 300-level or higher (0.5 unit) - *specifically for Ecology Specialization*

Three electives (1.5 units)

Rationale: BIOL 451 will serve as a “capstone course” for Honours Biology students taking the Environmental Biology Specialization and Honours Environmental Science students taking the Ecology Specialization. The goal is to have all Honours Biology and Honours Environmental Science, Ecology Specialization students take one capstone course for the completion of their degree. Capstone courses will have smaller enrollments, be highly

interactive, and place emphasis on concept integration, critical analysis and communication. The inclusion of BIOL 451 increases the required BIOL units by 0.5 and as a result, BIOL electives units are reduced by 0.5. The addition of BIOL 312 to the elective list will provide students with a spring term program elective option.

Faculty of Science Honours Material and Nanosciences

3. **Motion:** To approve the proposed changes to the Honours Material and Nanosciences program as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Honours Material and Nanosciences

The Honours Materials and Nanosciences program is an interdisciplinary plan offered jointly by the Department of Chemistry and the Department of Physics and Astronomy. Both materials science and nanoscience have been very active research areas during the past few decades, and are now having a major impact in diverse fields, ranging from manufacturing to materials technology to nanomedicine to renewable energy to computer information technology. This program is aimed at students interested in learning about and working in these rapidly evolving high-tech fields and is distinct from the more applied complements the Nanotechnology Engineering program offered through the Faculty of Engineering. It is designed for students who are motivated by, and interested in the fundamental building blocks of materials and devices, both at the macroscopic and nanometer scales.

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Continuing in the Honours Materials and Nanosciences program requires a cumulative overall average of 60% and a cumulative overall Science average of 60%.

Successful completion of this program requires:

22.0 units that include:

- ~~4.5-5.0~~ MNS units: MNS 101, MNS 102, MNS 201L, MNS 211, MNS 221, MNS 321, MNS 322, MNS 331, and MNS 410 or and MNS 431
- ~~2.75-3.5~~ CHEM units: CHEM ~~120-121~~, CHEM ~~120L-121L~~, CHEM ~~123-125~~, CHEM ~~123L-125L~~, CHEM 140, CHEM 209, CHEM 250L, CHEM 254, and CHEM 266L, and CHEM 356
- ~~3.0-4.5~~ PHYS units: PHYS 121, PHYS 121L, PHYS 122, PHYS 132L, PHYS 232L, PHYS 234, PHYS 242, and PHYS 334, PHYS 342, and PHYS 359
- 2.5 MATH units: MATH 114, MATH 127, MATH 128, MATH 227, and MATH 228
- ~~8.75-6.0~~ elective units distributed as follows:
 - ~~a minimum of 0.25 unit from CHEM 237L and CHEM 250L (Refer to Note 1)~~
 - 0.5 unit from CHEM 233 or CHEM 237 (Refer to Note 21)
 - 0.5 unit from CHEM 264 or CHEM 266 (Refer to Note 32)
 - ~~0.5 unit from CHEM 254 or PHYS 358 (Refer to Note 4)~~
 - ~~a minimum of 0.5 unit from PHYS 280 and PHYS 335~~
 - ~~2.0-1.0~~ program elective units, 300-level or higher
 - 1.0 program elective unit, 400-level
 - ~~2.0-1.5~~ program elective units, any level
 - 1.5 units from any 0.25 or 0.5 unit courses
- 0.5 ENGL unit: ENGL 193/SPCOM 193

Additional Program Requirement:
Students should enrol in MNS 10 every fall and winter term.

Notes

- ~~1. Students should take CHEM 237L in Year Three winter or CHEM 250L in Year Three fall.~~
- ~~21. Students wishing to take CHEM 233 and CHEM 237L must obtain permission from the instructor of CHEM 237L to override the prerequisite of CHEM 237.~~
- ~~32. Students wishing to take CHEM 264 instead of CHEM 266 must obtain permission from the instructor of CHEM 266L to override the prerequisite of CHEM 266.~~
- ~~43. Students should take CHEM 254 in Year Two winter or PHYS 358 in Year Three fall.~~

Recommended Course Sequence

Year One

Fall

~~CHEM 120/CHEM 120L~~ CHEM 121/CHEM 121L Physical and Chemical Properties of Matter/Chemical Reaction Laboratory 1
MATH 114 Linear Algebra for Science
MATH 127 Calculus 1 for the Sciences
MNS 10 Materials and Nanosciences Seminar
MNS 101 Materials and Nanosciences in the Modern World
PHYS 121/PHYS 121L Mechanics/Mechanics Laboratory

Winter

~~CHEM 123/CHEM 123L~~ CHEM 125/CHEM 125L Chemical Reactions, Equilibria and Kinetics/Chemical Reactions Laboratory 2
MATH 128 Calculus 2 for the Sciences
MNS 10 Materials and Nanosciences Seminar
MNS 102 Techniques for Materials and Nanosciences
PHYS 122/PHYS 132L Waves, Electricity and Magnetism/Waves, Electricity and Magnetism Laboratory
One of ENGL 193/SPCOM 193 Communication in the Sciences

Year Two

Fall

CHEM 140 Introduction to Scientific Calculations
CHEM 209 Introductory Spectroscopy and Structure
CHEM 266 Basic Organic Chemistry 1
or CHEM 264 Organic Chemistry 1 - (*Refer to Note 32*)
CHEM 266L Basic Organic Chemistry Laboratory
MATH 227 Calculus 3 for Honours Physics
MNS 10 Materials and Nanosciences Seminar
MNS 211 Chemistry and the Solid State
PHYS 232L Measurement Laboratory
~~One elective (0.5 unit)~~

Winter

MATH 228 Differential Equations for Physics and Chemistry
MNS 10 Materials and Nanosciences Seminar
~~MNS 201L Materials and Nanosciences Laboratory~~

MNS 221 Physics and the Solid State
PHYS 242 Electricity and Magnetism 1
PHYS 234 Quantum Physics 1
CHEM 254 Introductory Chemical Thermodynamics
~~One elective (0.5 unit) — (Refer to Note 4)~~

Year Three

Fall

CHEM 250L Physical Chemistry Laboratory 1 ~~— (Refer to Note 1)~~
~~CHEM 356 Introductory Quantum Mechanics~~
MNS 10 Materials and Nanosciences Seminar
MNS 321 Electrical and Optical Properties of Materials
~~Three/Four~~ electives (1.5/2.0 units) ~~— (Refer to Note 4)~~

Winter

CHEM 237 Introductory Biochemistry
or CHEM 233 Fundamentals of Biochemistry - ~~(Refer to Note 21)~~
~~CHEM 237L Introductory Biochemistry Laboratory — (Refer to Note 1)~~
MNS 10 Materials and Nanosciences Seminar
MNS 201L Materials and Nanosciences Laboratory
MNS 322 Polymer Materials
MNS 331 Biomaterials
~~PHYS 280 Introduction to Biophysics~~
~~or PHYS 335 Condensed Matter Physics~~
PHYS 359 Statistical Mechanics
~~One elective (0.5 unit)~~

Year Four

Fall

MNS 10 Materials and Nanosciences Seminar
PHYS 342 Electricity and Magnetism 2
Four electives (2.0 units)

Winter

MNS 10 Materials and Nanosciences Seminar
MNS 410 Special Topics in Solid-State Materials
~~or MNS 431 Special Topics in Nano-Biomaterials~~
PHYS 334 Quantum Physics 2
~~Four/Two~~ electives (2.0/1.0 units)

List of Program Electives

CHEM 212 Structure and Bonding
CHEM 220 Intro Analytical Chemistry
CHEM 220L Analytical Chemistry Lab 1
CHEM 221 Multi-Component Analysis
CHEM 237L Introductory Biochemistry Laboratory
CHEM 267 Basic Organic Chemistry 2
CHEM 267L Organic Chemistry Laboratory
CHEM 310 Transition Metals/Inorganic Materials
CHEM 333 Metabolism 1

CHEM 340 Introduction to Computational Chemistry
CHEM 350 Chemical Kinetics
CHEM 357 Physical Biochemistry
CHEM 400 Special Topics in Chemistry (~~excluding Special Topics: Polymer Properties and Polymerization~~)
CHEM 430 Special Topics in Biochemistry
CHEM 494A Research Project and CHEM 494B Research Project
PHYS 225 Modelling Life Physics
PHYS 236 Computational Physics 1
PHYS 242L Electricity and Magnetism Laboratory
PHYS 256 Geometrical and Physical Optics
PHYS 256L Optics Laboratory
PHYS 260L Intermediate Physics Laboratory
PHYS 280 Introduction to Biophysics
PHYS 334 Quantum Physics 2
PHYS 335 Condensed Matter Physics
PHYS 359 Statistical Mechanics
PHYS 360A Modern Physics, Laboratory 1
PHYS 360B Modern Physics Laboratory 2
PHYS 364 Mathematical Physics 1
PHYS 365 Mathematical Physics 2
PHYS 380 Molecular and Cellular Biophysics
PHYS 391 Electronics
PHYS 391L Electronics Laboratory
PHYS 392 Scientific Measurement and Control
PHYS 396 Biophysics of Imaging
PHYS 434 Quantum Physics 3
PHYS 435 Current Topics in Condensed Matter Physics
PHYS 437A Research Project and PHYS 437B Research Project
PHYS 461 Nanophysics

Rationale: Several changes are made to the regular MNS program (including editorial changes to the first paragraph that do not require approval) either to: a) account for first year Chemistry course changes; b) consolidate and standardize courses taken by both the regular and co-op streams; c) add additional core course requirements; d) add additional program electives; and e) make sequence changes to required courses based on course changes, prerequisites and terms of offering. The changes are summarized as follows:

- Replace the CHEM 120/120L and CHEM 123/123L requirements with CHEM 121/121L and CHEM 125/125L;
- Consolidate and standardize the courses taken by both the regular and co-op streams replacing CHEM 356 (Introductory Quantum Mechanics) with PHYS 234 (Quantum Physics 1) for the regular stream to match the co-op stream;
- Remove the option of choosing either MNS 410 (Special Topics in Solid-State Materials) or MNS 431 (Special Topics in Nano-Biomaterials) in Year 4, making both required MNS courses because both are core in providing students with broad advanced knowledge in both hard and soft nanomaterials;
- Remove the option of choosing either Physics 358 (Thermal Physics) or CHEM 254 (Introductory Chemical Thermodynamics) from the required electives list, and add CHEM 254 as a required course. CHEM 254 is a pre-requisite for other upper-year courses and it does not require Math 228 as the pre-requisite, therefore, can be sequences ahead of MATH 228 for both streams;

- Remove the option of choosing either CHEM 250L or CHEM 237L from the required electives list, adding CHEM 250L as a required course. This removes the need for a note suggesting the sequencing of these two 0.25-unit lab courses;
- Remove the option of choosing PHYS 280 (Introduction to Biophysics) or PHYS 335 (Condensed Matter Physics) from required electives list, re-designating both courses as option in the list of program electives;
- Add PHYS 359 (Statistical Mechanics) as a required PHYS courses because Statistical Mechanics is viewed as one of the core subjects in physics;
- Add PHYS 334 (Quantum Physics 2) as a required PHYS course, removing it from the list of program electives, to provide a more complete discussion of quantum physics, building on PHYS 234 (Quantum Physics 1);
- Add CHEM 140 as a required CHEM course, sequencing it for Year 2A as it is a prerequisite for CHEM 250L and CHEM 340. This course is beneficial to allow students to learn the necessary computer skills for other lab courses;
- Move MNS 201L from Year 2 winter to Year 3 winter for the regular stream, to lighten up the load in Year 2 winter (MNS 201L stays in Year 2 spring for the co-op stream as this term is less intense than that for the regular stream, which must take MATH 228 and PHYS 234 in Year 2 winter, whereas these courses are part of Year 3 for the co-op stream);
- Add PHYS 242L (Electricity and Magnetism Laboratory), PHYS 256L (Optical Laboratory), PHYS 260L (Intermediate Physics Laboratory), PHYS 391L (Electronics Laboratory), and CHEM 267L (Organic Chemistry Laboratory) to the program elective list of courses to provide students with more choices and flexibility;
- Remove the obsolete PHYS 392 from the program elective list;
- Remove 1.5 units of program elective options to maintain total program units at 22.0.
- Remove the exclusion of CHEM 400 special topic on polymers, the “Polymer Properties and Polymerization” from the Program elective list as revised content of this topics course no longer significantly overlaps content of required course, MNS 322.

Faculty of Science

Honours Co-operative Material and Nanosciences

4. **Motion:** To approve the proposed changes to the Honours Co-operative Material and Nanosciences program as described below, effective 1 September 2020.

Revised calendar text: (strike out = deleted text, bold = new entry)

Honours Co-operative Material and Nanosciences

The Honours Co-operative Materials and Nanosciences program is an interdisciplinary program offered jointly by the Department of Chemistry and the Department of Physics and Astronomy. Both materials science and nanoscience have been very active research areas during the past few decades, and are now having a major impact in diverse fields, ranging from manufacturing to materials technology to nanomedicine to renewable energy to computer information technology. This program is aimed at students interested in learning about and working in these rapidly evolving high-tech fields and is distinct from the more applied ~~complements the~~ Nanotechnology Engineering program offered through the Faculty of Engineering. It is designed for students who are motivated by, and interested in the fundamental building blocks of materials and devices, both at the macroscopic and nanometer scales.

The Honours Co-operative Materials and Nanosciences program meets admission requirements for graduate programs in Chemistry, and would be particularly suitable for admission into Nanoscience and Nanotechnology graduate programs. It is also intended for students who wish to find employment in industries associated with such fields as alternative energy sources, information technology, emerging materials, and biomedical therapies

and diagnostics.

The Honours Co-operative Materials and Nanosciences program takes the form of a core of required courses plus appropriate electives. The electives allow students to strengthen complementary areas of interest.

This program, which offers the Honours Materials and Nanoscience courses integrated with five four-month work terms, extends over ~~five~~ ~~four~~ and ~~two~~ ~~three~~ years. Students work and study in alternate terms starting at the end of 2A term. There is a double work term between terms 3B and 4A. Detailed information on co-op program requirements is located in the Co-operative Education and Career Action (CECA) section of this Calendar and in the Science Faculty work-term report guidelines. WatPD courses information is located on the Professional Development program website.

Continuing in the Honours Co-operative Materials and Nanosciences program requires a cumulative overall average of 60% and a cumulative overall Science average of 60%.

Successful completion of this program requires:

1. 22.0 units that include:
 - ~~4.5~~ 5.0 MNS units: MNS 101, MNS 102, MNS 201L, MNS 211, MNS 221, MNS 321, MNS 322, MNS 331, ~~and~~ MNS 410 ~~or~~ and MNS 431
 - ~~2.25~~ 3.5 CHEM units: CHEM 120-121, CHEM 120L-121L, CHEM 123-125, CHEM 123L-125L, CHEM 140, CHEM 209, CHEM 250L, CHEM 254, and CHEM 266L
 - ~~3.5~~ 4.5 PHYS units: PHYS 121, PHYS 121L, PHYS 122, PHYS 132L, PHYS 232L, PHYS 234, PHYS 242, ~~and~~ PHYS 334, PHYS 342, and PHYS 359
 - ~~2.0~~ 2.5 MATH units: MATH 114, MATH 127, MATH 128, ~~and~~ MATH 227, and MATH 228
 - ~~0.5~~ AMATH unit: AMATH 250
 - ~~8.75~~ 6.0 elective units, distributed as follows:
 - ~~a minimum of 0.25 unit from~~ CHEM 237L ~~and~~ CHEM 250L (*Refer to Note 1*)
 - 0.5 unit from CHEM 233 or CHEM 237 (*Refer to Note 21*)
 - 0.5 unit from CHEM 264 or CHEM 266 (*Refer to Note 32*)
 - ~~0.5 unit from~~ CHEM 254 ~~or~~ PHYS 358 (*Refer to Note 4*)
 - ~~a minimum of 0.5 unit from~~ PHYS 280 ~~and~~ PHYS 335
 - ~~2.0~~ 1.0 program units, 300-level or higher
 - 1.0 program unit, 400-level
 - ~~2.0~~ 1.5 program units, any level
 - 1.5 units of any 0.25 or 0.5 unit courses
 - 0.5 ENGL unit: ENGL 193/SPCOM 193
2. Co-operative education requirements that include:
 - A minimum of four work terms
 - Four WatPD (professional development) courses that must include PD 1, PD 11, and two PD elective courses
 - Four work-term reports:
 - One completed as part of PD 11
 - Three completed in required WKRPT courses: WKRPT 200S, WKRPT 300S, and WKRPT 400S

Additional Program Condition:

Student should enrol in MNS 10 every fall and winter academic term.

Notes

- ~~1. Students should take~~ CHEM 237L ~~in Year Three winter (before the double work term) or~~ CHEM 250L ~~in Year Four fall.~~
- ~~21.~~ Students wishing to take CHEM 233 and CHEM 237L must obtain permission from the instructor of CHEM 237L to override the prerequisite of CHEM 237.
- ~~32.~~ Students wishing to take CHEM 264 instead of CHEM 266 must obtain permission from the instructor of CHEM 266L to override the prerequisite of CHEM 266.
- ~~4. Students should take~~ CHEM 254 ~~(instead of~~ PHYS 358 ~~) in Year Two spring to be eligible for~~ MNS 331

~~in Year Three.~~

Recommended Course Sequence

Year One

Fall

~~CHEM 120/CHEM 120L~~ CHEM 121/CHEM 121L Physical and Chemical Properties of Matter/Chemical Reaction Laboratory 1
MATH 114 Linear Algebra for Science
MATH 127 Calculus 1 for Sciences
MNS 10 Materials and Nanosciences Seminar
MNS 101 Materials and Nanoscience in the Modern World
PHYS 121/PHYS 121L Mechanics/Mechanics Laboratory

Winter

~~CHEM 123/CHEM 123L~~ CHEM 125/CHEM 125L Chemical Reactions, Equilibria, and Kinetics/Chemical Reactions Laboratory 2
MATH 128 Calculus 2 for Sciences
MNS 10 Materials and Nanosciences Seminar
MNS 102 Techniques for Materials and Nanosciences
PHYS 122/PHYS 132L Waves, Electricity and Magnetism/Waves, Electricity and Magnetism Laboratory
One of ENGL 193/SPCOM 193 Communication in the Sciences

Year Two

Fall

CHEM 140 Introduction to Scientific Calculations
CHEM 209 Introductory Spectroscopy and Structure
CHEM 266 Basic Organic Chemistry 1
or CHEM 264 Organic Chemistry 1 - (*Refer to Note 32*)
CHEM 266L Basic Organic Chemistry Laboratory
MATH 227 Calculus 3 for Honours Physics
MNS 10 Materials and Nanosciences Seminar
MNS 211 Chemistry and the Solid State
PHYS 232L Measurement Laboratory
~~One elective (0.5 unit)~~

Spring

~~AMATH 250~~ Introduction to Differential Equations
~~CHEM 254~~ Introductory Chemical Thermodynamics—(*Refer to Note 4*)
MNS 201L Materials and Nanoscience Laboratory
MNS 221 Physics and the Solid State
PHYS 242 Electricity and Magnetism 1
One elective (0.5 unit)

Year Three

Winter (Before double work term)

MATH 228 Differential Equations for Physics and Chemistry
CHEM 233 Fundamentals of Biochemistry - (*Refer to Note 1-2*)
or CHEM 237 Introductory Biochemistry
~~CHEM 237L~~ Introductory Biochemistry Laboratory—(*Refer to Note 1*)

MNS 10 Materials and Nanosciences Seminar
MNS 322 Polymer Materials
PHYS 234 Quantum Physics 1
~~Two~~One electives (~~1.0~~0.5 unit)

Winter (After double work term)

MNS 10 Materials and Nanosciences Seminar
MNS 331 Biomaterials
~~PHYS 280~~ Introduction to Biophysics
~~–or PHYS 335~~ Condensed Matter Physics
PHYS 359 Statistical Mechanics
Three electives (1.5 units)

Year Four

Fall

CHEM 250L Physical Chemistry Laboratory 1 ~~–(Refer to Note 1)~~
PHYS 342 Electricity and Magnetism 2
MNS 10 Materials and Nanosciences Seminar
MNS 321 Electrical and Optical Properties of Materials
Three electives (1.5 units)

Winter

MNS 10 Materials and Nanosciences Seminar
MNS 410 Special Topics in Solid-State Materials
~~–or MNS 431~~ Special Topics in Nano-Biomaterials
PHYS 334 Quantum Physics 2
~~Four~~Two electives (~~2.0~~1.0 units)

List of Program Electives

CHEM 212 Structure and Bonding
CHEM 220 Intro Analytical Chemistry
CHEM 220L Analytical Chemistry Lab 1
CHEM 221 Multi-Component Analysis
CHEM 237L Introductory Biochemistry Laboratory
CHEM 267 Basic Organic Chemistry 2
CHEM 267L Organic Chemistry Laboratory
CHEM 310 Transition Metals/Inorganic Materials
CHEM 333 Metabolism 1
CHEM 340 Introduction to Computational Chemistry
CHEM 350 Chemical Kinetics
CHEM 357 Physical Biochemistry
CHEM 400 Special Topics in Chemistry ~~(excluding Special Topics: Polymer Properties and Polymerization)~~
CHEM 430 Special Topics in Biochemistry
CHEM 494A Research Project and CHEM 494B Research Project
PHYS 225 Modelling Life Physics
PHYS 236 Computational Physics I
PHYS 242L Electricity and Magnetism Laboratory
PHYS 256 Geometrical and Physical Optics
PHYS 256L Optics Laboratory
PHYS 260L Intermediate Physics Laboratory

PHYS 280 Introduction to Biophysics
~~PHYS 334 Quantum Physics 2~~
PHYS 335 Condensed Matter Physics
~~PHYS 359 Statistical Mechanics~~
PHYS 360A Modern Physics, Laboratory 1
PHYS 360B Modern Physics, Laboratory 2
PHYS 364 Mathematical Physics 1
PHYS 365 Mathematical Physics 2
PHYS 380 Molecular and Cellular Biophysics
PHYS 391 Electronics
PHYS 391L Electronics Laboratory
~~PHYS 392 Scientific Measurement and Control~~
PHYS 396 Biophysics of Imaging
PHYS 437A Research Project and PHYS 437B Research Project
PHYS 434 Quantum Physics 3
PHYS 435 Current Topics in Condensed Matter Physics
PHYS 461 Nanophysics

Rationale: Several changes are made to the co-operative MNS program (including editorial ones in the opening paragraphs that do not require approval) either to: a) account for first year Chemistry course changes; b) consolidate and standardize courses taken by both the regular and co-op streams; c) add additional core course requirements; d) add additional program electives; and e) make sequence changes to required courses based on course changes, prerequisites and terms of offering. The changes are summarized as follows:

- Replace the CHEM 120/120L and CHEM 123/123L requirements with CHEM 121/121L and CHEM 125/125L;
- Consolidate and standardize the courses taken by both the regular and co-op streams by replacing AMATH 250 (Introduction to Differential Equations) with MATH 228 (Differential Equations for Physics and Chemistry) for the co-op stream to match the regular stream;
- Remove the option of choosing either MNS 410 (Special Topics in Solid-State Materials) or MNS 431 (Special Topics in Nano-Biomaterials) in Year 4, making both required MNS courses because both are core in providing students with broad advanced knowledge in both hard and soft nanomaterials;
- Remove the option of choosing either Physics 358 (Thermal Physics) or CHEM 254 (Introductory Chemical Thermodynamics) from the required electives list, and add CHEM 254 as a required course. CHEM 254 is a pre-requisite for other upper-year courses and it does not require Math 228 as the pre-requisite, therefore, can be sequenced ahead of MATH 228 for both streams;
- Remove the option of choosing either CHEM 250L or CHEM 237L from the required electives list, adding CHEM 250L as a required course. This removes the need for a note suggesting the sequencing of these two 0.25-unit lab courses;
- Remove the option of choosing PHYS 280 (Introduction to Biophysics) or PHYS 335 (Condensed Matter Physics) from required electives list, re-designating both courses as option in the list of program electives;
- Add PHYS 359 (Statistical Mechanics) as a required PHYS course because Statistical Mechanics is viewed as one of the core subjects in physics;
- Add PHYS 334 (Quantum Physics 2) as a required PHYS course, removing it from the list of program electives, to provide a more complete discussion of quantum physics, building on PHYS 234 (Quantum Physics 1);
- Add CHEM 140 as a required CHEM course, sequencing it for Year 2A as it is a prerequisite for CHEM 250L and CHEM 340. This course is beneficial to allow students to learn the necessary computer skills for other lab courses;

- Add PHYS 242L (Electricity and Magnetism Laboratory), PHYS 256L (Optical Laboratory), PHYS 260L (Intermediate Physics Laboratory), PHYS 391L (Electronics Laboratory), and CHEM 267L (Organic Chemistry Laboratory) to the program elective list of courses to provide students with more choices and flexibility;
- Remove the obsolete PHYS 392 from the program elective list;
- Remove 1.5 units of program elective options to maintain total program units at 22.0.
- Remove the exclusion of CHEM 400 special topic on polymers, the “Polymer Properties and Polymerization” from the Program elective list as revised content of this topics course no longer significantly overlaps content of required course, MNS 322.

/rmw

David DeVidi
Associate Vice-President, Academic

University of Waterloo
SENATE LONG RANGE PLANNING COMMITTEE
Report to Senate
21 October 2019

The Senate Long Range Planning Committee met on 10 October 2019 and agreed to forward the following item to Senate as part of the regular report.

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

FOR APPROVAL

UNIVERSITY STRATEGIC PLAN

Motion: That Senate recommend that the Board of Governors approve the University of Waterloo Strategic Plan 2020-2025, as presented at Attachment 1.

Background: Following an extensive process of consultation, analysis, and development led by the president and the provost over the course of 18 months, the Senate Long Range Planning Committee considered the draft Strategic Plan 2020-2025 in substantially the terms submitted to Senate with this report. The Senate Long Range Planning Committee supports the focus outlined in the strategic plan—including principles, core elements, integrative themes for action, goals and objectives—and recommends that Senate support the adoption of the strategic plan and that it recommend its approval by the Board of Governors.

/kw

Jim Rush
Vice-President, Academic & Provost



To: Members of the Senate

From: Feridun Hamdullahpur, president and vice-chancellor

Date: Friday 11 October 2019

Subject: **Strategic Plan 2020-2025 – Final Version for Approval**

Thank you for taking time to reflect on the University's Strategic Plan 2020-2025. Together with the planning team, I have reviewed the feedback we received from members of the Senate and Board of Governors.

This new draft balances recent feedback with the perspectives shared through our extensive consultation and development process. One of the noteworthy changes include further articulation of the external, global context in which our plan will be delivered as well as our unique position at the intersection of the plan's three themes. There is also an amendment to the "learning pathways" commitment with added references to teaching throughout the plan. We also acknowledge Waterloo's commitment to fundamental, curiosity-based research as well as our research strengths in the human dimensions of global challenges. We included both academic and research endeavours in our commitment to work at the interface of health, technology and society.

Other changes include Waterloo's responsibility to improve society, promote sustainability and address climate change. Our commitment to learning about the rich history and culture of Indigenous people and our commitment to all TRC recommendations is now explicit. We have also explicitly demonstrated our commitment to mental health and the importance of athletics, the arts, community engagement, and student leadership.

Thank you again for your enthusiastic engagement with this important, ambitious Strategic Plan which was endorsed by the Senate Long Range Planning Committee at its meeting on 10 October 2019.

UNIVERSITY OF WATERLOO
STRATEGIC PLAN / 2020-2025

CONNECTING IMAGINATION WITH IMPACT

DRAFT FOR APPROVAL

UNIVERSITY OF
WATERLOO



WATERLOO IS BUILT FOR CHANGE

A new Waterloo plan for an era of rapid change.

It's tempting to call on the courage of our founders to introduce Waterloo's new strategic plan but my mind keeps turning to our first-year students.

They come here on the promise of a bright future. They live and learn with strangers for a time. Very quickly, they move beyond lecture halls into workplaces, relationships, laboratories, incubators and the field.

They choose to study at an institution that is fundamentally different from many universities in the world. They embrace a learning community deeply connected to the dynamism and disruptions of the real world.

We are launching this strategic plan at a time of rapid societal, technological and environmental change. Universities are being called to improve society and drive prosperity in a responsible way by challenging traditional models of education.

BUILT FOR CHANGE

The good news is Waterloo was built for change. Our willingness to take risks and embrace new approaches distinguished us from the beginning when we established our renowned co-operative education program and allowed entrepreneurial researchers to own their intellectual property.

Waterloo's co-operative education program has also created a vast network of employers that inspires learning and research while connecting Waterloo people to the immediate and long-term needs of industry and communities around the world. We believe Waterloo's unique approach to solving important problems – one that combines boundary-pushing research, experiential education and entrepreneurship – is how we contribute to society.

As much as our foundation is rock solid, we are not standing still.

THEMES FOR IMPACT

This strategic plan builds on our foundation in three intersecting themes for impact, all with local and global impact:

- **Developing talent for a complex future**
- **Advancing research for global impact**
- **Strengthening sustainable and diverse communities**

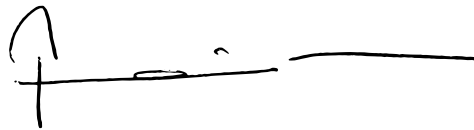
We are committed to transforming how we teach and learn. We are committed to supporting fundamental research as well as collaboration across research disciplines. We will empower future-ready talent who will realize their fullest potential through richer student experiences that only Waterloo can provide. It is at the intersections of these three theme areas that Waterloo is uniquely positioned to produce talent and knowledge to drive societal, environmental and economic well-being.

We will leverage our global employer network to power international and interdisciplinary innovations as our brightest minds build relationships with policy-makers, community members and business people from around the world. We know the most urgent issues of our time, from climate change to automation and an aging population, call us to work across disciplines.

CONNECTING TALENT AND KNOWLEDGE TO THE REAL WORLD

Consider again the courage of our first-year students. Early on in their studies we call on them to adapt to the uncertainties of the real world.

It's time for all of us to embrace their courage and leverage the advantages of our Waterloo culture to build the 21st-century model of a university: a place where talent and knowledge impact the complex, changing realities of our society, climate and the economy.



FERIDUN HAMDULLAHPUR

PRESIDENT AND VICE-CHANCELLOR

SIGNATURE COMMITMENTS

BY 2025, THE UNIVERSITY OF WATERLOO WILL:

- Build on our global leadership in co-operative education to provide every undergraduate and graduate student with expanded options in experiential learning.
- Empower students to leverage diverse learning experiences by creating more flexible learning pathways.
- Be a global powerhouse for commercializing research, developing new enterprises and supporting business growth.
- Leverage Waterloo's vast employer network and academic strengths to deliver a dynamic framework of learning-integrated work for professionals seeking to thrive and lead.
- Align our research strengths deliberately with important global challenges.
- Lead globally and nationally at the interface of society, health and technology.
- Create a sustainable, supportive environment for living, learning, working and discovery that is worthy of our students and University community.

OUR VISION

Waterloo: Connecting imagination with impact for a better world.

In this strategic plan, we are building on our unconventional foundation by reimagining three broad themes for impact that will position Waterloo to develop talent for a complex future, advance research for global impact and strengthen Waterloo's sustainable and diverse communities.

These three themes share a vision for a better world that includes the broadest spectrum of innovation – from imagination to impact.

Scholars and students who want to solve the world's deepest mysteries will find a home here. Researchers and entrepreneurs seeking solutions to climate change and other complex health, social or environmental problems will pursue their passions here.

Some will thrive by following their dreams and building partnerships with industry, government or the community. While disciplinary strengths are essential, we believe many new discoveries, innovations and solutions will follow a path that cuts across traditional disciplines. All of our endeavours will grow in an inclusive community for students, faculty, staff and alumni within and beyond the borders of our campuses.

We embrace the reality of students who are both poet and marketer, engineer and activist, scientist and entrepreneur, mathematician and artist. Some in our diverse community may pursue passions in philosophy and computer science, while others blend history and health.

Waterloo will innovate for a better world by inspiring imagination and enabling our people to realize their boldest dreams.

OUR MISSION

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.

(The University of Waterloo Act)

The University of Waterloo is a signatory to the Magna Charta Universitatum which upholds four fundamental principles: moral and intellectual independence of teaching and research; the inseparable nature of teaching and research; freedom in research and teaching; and the affirmation of the vital need for different cultures to know and influence each other in the constant pursuit of universal knowledge.

OUR VALUES

At Waterloo, we will navigate this age of complexity guided by our nimble culture and our shared connection to the human values of curiosity, courage, engagement and belonging.

WE ARE CURIOUS.

Curiosity drives the important work of fundamental research. It transforms teaching and learning and creates new connections on our campus and around the world. The same spirit of inquiry that inspires researchers to investigate the wonder of our world motivates professors to take risks in their teaching and learning practice. Curiosity drives students to build their own ventures or pursue new disciplines, while faculty and staff seek new challenges to support the University's mission and propel it forward.

WE ARE COURAGEOUS.

Waterloo's founders made the courageous decision to step outside centuries of university tradition by integrating co-operative education with academic excellence. Our innovative culture is also rooted in the unorthodox decision to grant researchers ownership of intellectual property. A culture of tenacity and risk-taking, which has transformed this region into a technology hub for innovation, will drive Waterloo forward with integrity and purpose as we seek solutions to important problems on our campus and in the world.

WE ARE ENGAGED.

In the 1950s, the University of Waterloo's founders took note of the global space race. They examined Canada's growing postwar economy. They listened to the needs of leaders in Waterloo region and created a unique university. Connecting with our community and being engaged nationally and globally is part of Waterloo's foundation. As we grapple with complex sustainability issues and environmental, geopolitical and technological changes in our society, we will continue Waterloo's tradition of looking outward for the betterment of humanity, with our willingness to engage in the most pressing challenges in our own community.

WE ALL BELONG.

We value each other as individuals. In our pursuit of excellence, we create conditions for everyone to flourish. We know that academic rigour and genuine care and concern can co-exist. The University of Waterloo celebrates campus members and our alumni while striving to proactively find, prevent and remove barriers so everyone can achieve their full potential. Diverse voices and perspectives enrich our teaching and research. Waterloo honours the complexity that distinct cultures and multiple identities and views bring to the vital work of teaching and research in our society. Achieving a positive learning experience requires a proactive community that demonstrates genuine care, concern and respect for all members and the world in which we live.

IMPACT THEMES

At Waterloo, we believe that society advances when universities are connected to the community, industry and policy-makers who shape our country and the world.

Learners want relevant, authentic experiences that will prepare them for a complex future. Employers want talent that can adapt to and lead change. Rapid technological, environmental and societal changes call us to work in new ways – across disciplines, borders and sectors – to find solutions to complex challenges of the future. All of this must happen within a diverse environment so everyone can participate to their full potential for optimal solutions.

When we reflect on Waterloo's past we can be confident that we have understood risk, embraced change and delivered results. But now is the time for renewal. New forces of change – economic restructuring, an aging society, political instability and rapid advances in technology – call us to reimagine our role as an architect of Canada's future.

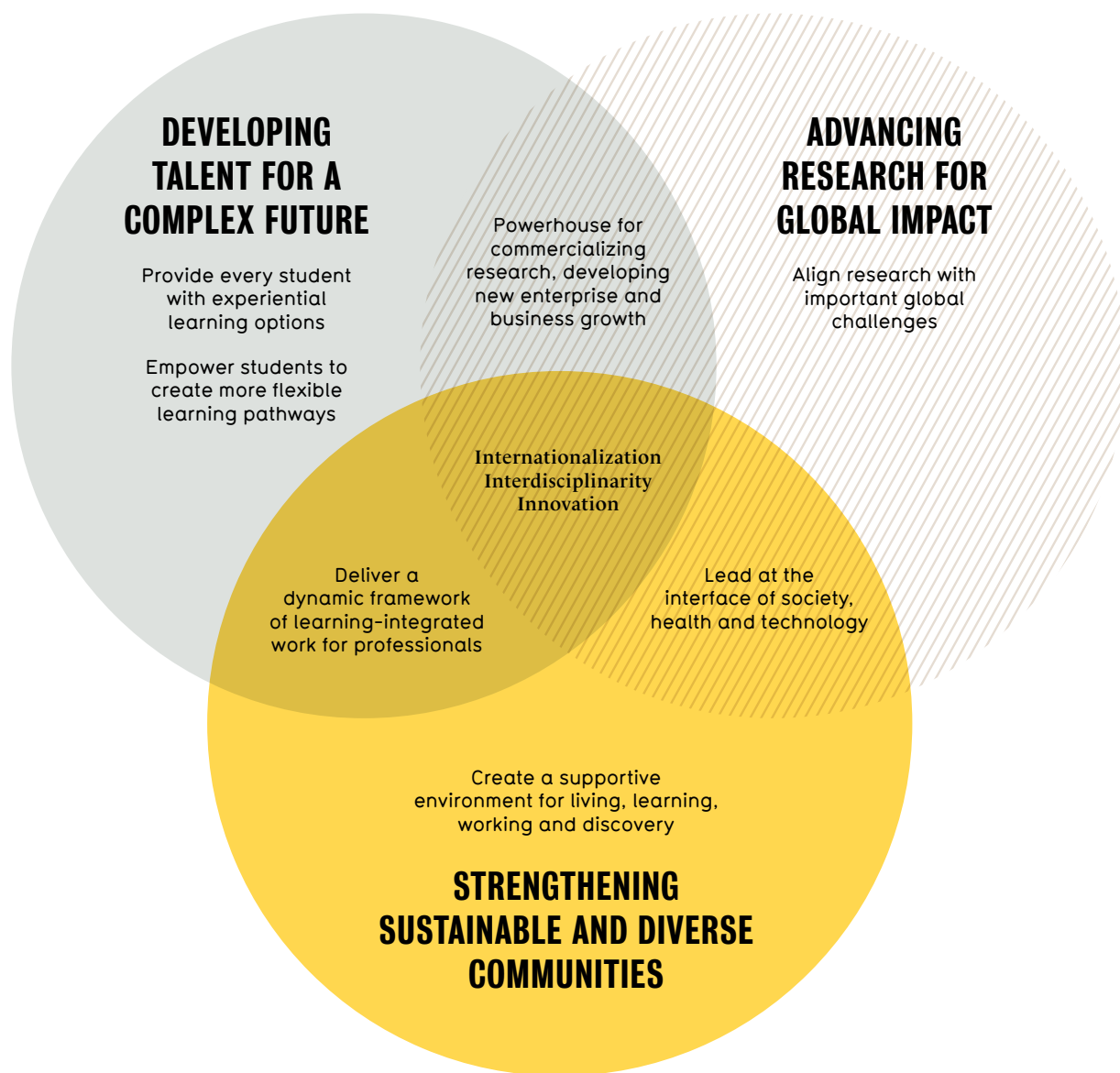
Our vast employer network, grown through our co-operative education program, will continue to give our students an advantage as they push their talent beyond conventional boundaries. Waterloo's tradition of experiential learning challenges our diverse professors to think beyond the classroom. It inspires our researchers and enriches our globally renowned entrepreneurial ecosystem.

Waterloo will build on our foundation to mobilize change at the intersection of three theme areas, all with local and global impact:

- **Developing talent for a complex future**
- **Advancing research for global impact**
- **Strengthening sustainable and diverse communities**

Our focus on internationalization and interdisciplinarity will enrich new thinking in these three theme areas. Attracting talent from around the world creates a dynamic teaching environment that catalyzes learning with cultural awareness. Students will learn in a variety of disciplines and become more attuned to our complex world, while researchers will break down barriers between disciplines to identify and solve complex problems. Diversity will support transformation as we meet the challenges of our future.

Internationalization will bring diverse talent from around the world to our campus while giving students and researchers more opportunities to build relationships globally. Innovation underpinned by internationalization and interdisciplinarity will help Waterloo take an even more prominent role on the world stage.



DEVELOPING TALENT FOR A COMPLEX FUTURE

Learners will have to apply knowledge in contexts we cannot even imagine today.

Waterloo is preparing people to lead in a future that promises great opportunity and waves of disruption. The talent we develop at Waterloo will continue to have an impact in our region and around the world.

Our vision for the future places learners at the centre of everything we do. Waterloo will foster an integrated learning environment that is powered by curiosity, informed by research and transformative in practice.

Students must be prepared for an age of rapid technological, environmental and economic shifts. Our graduates will have to apply knowledge in contexts that we cannot even imagine today. No industry or career pathway will be immune to the changes. Canada and the world will need creative minds who can navigate diverse identities and leverage new knowledge to create sustainable, prosperous communities.

Teaching and learning at Waterloo will be interdisciplinary and international. Students will be empowered by supportive connections within and outside our University community. Today, Waterloo is a global leader in work-integrated learning. By 2025, Waterloo will also be a premier provider of learning-integrated work to support professionals and others who need to reskill and reimagine their careers.

We will build on our global leadership in co-operative education with a commitment to provide every undergraduate and graduate student with expanded options in experiential learning by 2025. We are also committed to empowering students to create more flexible learning pathways aligned with the future of work and learning.

We know first-hand how extra-curricular experiences such as community engagement, student leadership, athletics and the arts enrich learning. Waterloo will embrace bold new approaches in and out of the classroom in a caring environment that empowers future leaders with durable skills that include critical thinking, cultural competence and resilience.

Developing talent for a complex future:

GOALS AND OBJECTIVES

GOAL

Educate global citizens for the future of work and learning to thrive in an age of rapid change by putting learners at the centre of everything we do.

OBJECTIVES

- › Increase flexible curricula that stimulate reflective, deep learning and develop competencies to address global challenges and opportunities.
- › Promote quality and innovation in teaching and learning and support infrastructure, policy and practice that remove systemic barriers.
- › Find new ways to work together and remove barriers to collaboration, interdisciplinarity and the integration of knowledge.
- › Continue to advance an agile, technology-enabled learning ecosystem that supports high-quality, open content and digital learning options.
- › Further enhance the “Business at Waterloo” programming model to inspire people to lead in a rapidly changing economy.

GOAL

Continue to lead the world in co-operative education and support the workforce of the future through fully integrated academic and experiential learning opportunities.

OBJECTIVES

- › Leverage Waterloo’s employer, industry, government and alumni networks to enhance our connection to the community, Canada and the world.
- › Continue to demonstrate global prominence in the development, recruitment and retention of future-ready talent, with a focus on building a diverse workforce.
- › Increase interdisciplinary opportunities for co-op students to gain locally and globally relevant research experience.

GOAL

Establish a unique Waterloo approach to support learning at various stages of individuals' professional lives.

OBJECTIVES

- › Establish a lifelong learning centre that will enable and encourage our alumni and other professionals to reskill in a society that increasingly requires continuous learning.
- › Leverage and optimize government, industry and community partnerships and engage alumni in lifelong learning relationships.

GOAL

Enhance graduate and post-doctoral studies by emphasizing the unique attributes of the University of Waterloo and our talented and diverse graduate student community.

OBJECTIVES

- › Grow work-integrated learning opportunities in graduate studies.
- › Increase the availability and depth of partnerships with external agencies to advance applied research and learning opportunities for graduate students, post-doctoral scholars and faculty.
- › Foster an interdisciplinary environment for graduate students and post-doctoral scholars to increase the impact of their work.
- › Strengthen academic, personal and professional supports for our graduate student community.
- › Stimulate opportunities for interdisciplinary research by developing more flexible graduate programs.

ADVANCING RESEARCH FOR GLOBAL IMPACT

Waterloo's research environment is uniquely energized by co-operative education and entrepreneurship.

As a comprehensive, research-intensive university, Waterloo researchers embrace all forms of scholarship from curiosity-based inquiry to reflective scholarship and applied research. Waterloo's strong research culture is accelerated by our vibrant and dynamic fundamental research foundation.

WATERLOO WILL:

- **accelerate opportunities to lead in new and emerging research areas while building on our curiosity-based and fundamental, discipline-specific strengths.**

Our commitment to solving important problems in an integrated way – one that encompasses disciplinary and interdisciplinary research, experiential learning and all forms of entrepreneurship – is our defining approach to improving society.

Our research community has a unique perspective on real-world problems that is shaped by fundamental research excellence and the deep industry and community partnerships of our renowned co-operative education program.

By 2025, we are committed to aligning our research strengths deliberately with important global challenges:

- **Quantum science, nanotechnology, connectivity and telecommunications**
- **Water, energy and climate: sustainability, security, infrastructure**
- **Information technology and its impact, including intelligent systems, human-machine interfaces, cybersecurity, privacy and data science**
- **Robotics and advanced manufacturing**
- **Health technologies**

Addressing global challenges requires us to consider the key pillars that support this plan and their context: interdisciplinarity, internationalization and innovation. Importantly, the plan recognizes that success requires us to:

- **understand and enhance human experiences and address the human dimensions of global challenges and examine ways to translate knowledge for governance and policy.**

This will require the talents of leading Waterloo researchers in disciplines ranging from the humanities, social sciences, environmental studies, applied health sciences, the arts, science, engineering and mathematics, from fundamental research to policy development.

By 2025, Waterloo is also committed to being a global powerhouse for commercializing research, developing new enterprises and supporting business growth.

Technology is a critical tool for solving some of the world's problems, but so too are the policy changes and critical interventions that come from reflective scholarship. By 2025, Waterloo will lead nationally and globally at the interface of society, health and technology. By leveraging its research strengths in technology and the social, economic, biological and environmental determinants of health, Waterloo will lead in securing healthy futures for local and global communities.

Advancing research for global impact:

GOALS AND OBJECTIVES

GOAL

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

OBJECTIVES

- › Lead nationally and globally at the interface of society, health and technology by establishing an interdisciplinary institute that builds on Waterloo's academic and research strengths in technology as well as the determinants of health.
- › Create tomorrow's research leaders by attracting and retaining outstanding, diverse research faculty, graduate students and post-doctoral scholars from around the world.
- › Explore opportunities to create cross-Faculty, interdisciplinary research teams that use disciplinary strengths to address problems of societal importance.
- › Prioritize Waterloo's international partnerships to maximize impact for the global good.

GOAL

Achieve greater research impact by leveraging Waterloo's partnerships.

OBJECTIVES

- › Strengthen and increase formal partnerships with strategic research partner institutions.
- › Increase private-sector partnerships to develop and deploy new technologies that enhance the competitiveness and innovation of Canadian business.
- › Increase partnerships with the public and not for-profit sectors to catalyze important policy development.

GOAL

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

OBJECTIVES

- › Create interdisciplinary teams to engage with important sectors of Canada's economy to solve problems of common interest to the sector.
- › Increase infrastructure that supports commercialization and policy application of transformational research.
- › Establish a fund to provide commercialization internships for students, protect intellectual property and launch startup ventures.
- › Leverage alumni, research and industry networks to expand entrepreneurial opportunities for members of the Waterloo community.
- › Foster an engaged, nimble and open environment that stimulates entrepreneurial pursuits.

STRENGTHENING SUSTAINABLE AND DIVERSE COMMUNITIES

Waterloo will make an impact on its campuses and around the world by fostering inclusivity, a sense of belonging and a culture of involvement.

Our community is a beacon for some of the brightest minds in the world, but it is also more.

Our community has young people who are the first in their families to attend university. There are individuals from racialized groups whose voices have been marginalized.

Indigenous people live and work here. There are diverse individuals of many genders and sexual identities. There are international scholars who have left family behind to pursue their passions. Our community includes people with various abilities and distinct mental health experiences that result in different experiences of our campuses.

We all belong here.

The University is committed to living our shared responsibilities by building communities that imbue every aspect of our institution's mission with genuine care and concern for our students, faculty, staff, alumni and the world in which we live. As a leading institution mobilizing knowledge and research related to the United Nations Sustainable Development Goals, Waterloo is committed to sustainability within and beyond our campus borders.

We include those who live and work on our campuses and in our alumni communities in Waterloo region and around the world. We particularly recognize Indigenous students, faculty, staff and alumni. We are committed to learning about the rich history and culture of Indigenous people of this land and an institutional response to the Truth and Reconciliation Commission's calls for action.

OUR RESPONSIBILITY TO STUDENTS

We hold a particular responsibility to our students that is reflected in our teaching mission and commitment to build diverse communities. We know that opportunities for enrichment outside the classroom in extra-curricular activities such as athletics, the arts, student government and our community are vital to student growth. We are committed to a comprehensive approach to mental health and wellness. We strive to create a responsive environment for living, learning and discovery that is worthy of our diverse student community.

The innovative spirit that has distinguished Waterloo globally must now be used to advance communities that are equitable, accessible and sustainable. We recognize not everyone has had the same opportunities due to systemic, societal issues and we are committed to identifying and removing barriers so that everyone can flourish, regardless of background or identity.

We also recognize that accelerating climate change will magnify existing societal issues, with marginalized communities being among the most affected. Our students, employees, partners and stakeholders around the world will be looking to Waterloo for leadership as we model transformative changes for a sustainable future.

Strengthening sustainable and diverse communities:

GOALS AND OBJECTIVES

GOAL

Be a people-centered institution committed to genuine care, concern, respect, inclusivity and well-being for all.

OBJECTIVES

- › Working in partnership with all stakeholders, mobilize the commitments from the Okanagan Charter and Healthy Workplace statement to embed and promote sustainability and foster personal development and supportive environments for mental health and resilience, physical health, social inclusion, belonging and spiritual well-being in campus culture.
- › Nurture relationships between faculty and students to promote academic curiosity and risk-taking in a safe and supportive community of learners.
- › Create a supportive environment for international students that also celebrates their contributions to our diverse community.

GOAL

Foster a connected and supportive community that inspires students, faculty, staff and alumni to achieve their personal, academic and professional goals while feeling valued.

OBJECTIVES

- › Intentionally develop programming to inspire collaboration for shared research, teaching, learning and community building opportunities among our students, faculty, staff and alumni.
- › Develop a culture of involvement that fosters inclusivity and a sense of belonging.
- › Sustain a meaningful relationship with alumni around the world that includes peer support, social connection and learning over their lifetime.
- › Ensure co-op students experience continued connection to the University during their work terms.
- › Broaden our understanding and engagement of communities on our campuses and with our alumni, external partners, regional, national and international communities.

GOAL

Promote and support Indigenous initiatives and a culture of equity, diversity and inclusivity for all.

OBJECTIVES

- › Embrace and act upon the Truth and Reconciliation Commission's recommendations and calls to action and build stronger relationships with our local Indigenous community.
- › Improve the representation, participation and engagement of equity-seeking groups within our community.
- › Advance programs, policies and processes that foster equity, diversity and inclusivity.

GOAL

Continue to leverage our resources to engage, develop and build our capacity and infrastructure to create a sustainable and effective institution.

OBJECTIVES

- › Become a societal role model of sustainability in policy, process and practice through full implementation of the University's Environmental Sustainability Strategy and meaningful action to address climate change in our operations.
- › Leverage our entrepreneurial spirit and model organizational efficiency and sustainability in all domains of our service.
- › Ensure all campus community members understand their role in and contribute to a positive student experience.

CONCLUSION

This is our plan to embrace the forces of change in our world.

It is a plan that will enable our institution to continue to foster dynamic talent ready to flourish in new economies. It will allow us to challenge the status quo. It will enable us to support our community and students who are worthy of the absolute best experiences and outcomes.

We will embrace our heritage of bold ambition and risk-taking. We will continue to take action that crosses disciplines, sectors and national borders as we build a new model of a 21st-century university.

A strategic plan is a catalyst for change and renewal. Our community has come together to imagine a Waterloo for 2025 and beyond. Today, we will challenge ourselves to bring the ideas in this plan to life, monitor our progress and be accountable to one another.

Building on the dreams, scholarship, and diversity of people at Waterloo, we will unlock knowledge and innovation to shape the future of our nation and the world. This is our plan to connect imagination with impact for a better world.

Report of the Vice-President, Research and International to Senate

October 2019

Major Awards

Safieddin Safavi-Naeini, Electrical and Computer Engineering, has been awarded a Transport Canada grant of \$500,000 for their project “Smart Train Collision Avoidance System.” The project proposes to develop and test a new smart train avoidance system using high-resolution, long-range radar system mounted on trains to detect any moving or static objects on the railway crossing. This system aims to address the increasing rate of injuries and deaths due to train collisions at crossings with individuals.

The Centre of Sight Enhancement has been awarded a Ministry of Health (ON) grant of \$1,902,000 for its program to purchase and repurpose assistance devices to help qualified patients needing low vision support.

Maurice Dusseault, Earth and Environmental Studies, was awarded \$800,000 to facilitate the 21st round of the Daqing Contract Training Program. This training program with Daqing Oilfield Company sends upwards of 25 trainees from China to the University of Waterloo for professional development in geosciences, oil project management and furthering the ability of personnel to master English proficiency for international business. Total project funding since the beginning of the training program in 2001 has exceeded \$8.3 million dollars. Almost 500 professionals have attended the training programs, many have since secured senior level management positions in Chinese oil companies.

Jun Liu, Applied Math was awarded \$190,000 awarded to for their research cooperation with HUST-Wuxi Research Institute and Jiangsu Industrial Technology Research Institute in China. The research project entitled “Application of Temporal Logic Control in Intelligent Manufacturing” will combine expertise on cyber-physical systems modelling (HUST) and temporal logic control (Waterloo) to develop control algorithms for optimizing manufacturing processes. Potential outcomes include software tools that can be implemented and tested on digital manufacturing platforms.

Waterloo International

Inbound delegations

In September 2019, Waterloo International hosted delegations from Israel, South Africa and China:

- September 12 - Consul General of Israel, Galit Baram;
- September 16 - administrators from the University of Witwatersrand, South Africa;
- September 27 - a delegation from Nanjing University of Finance and Economics.

Safety and Security Abroad

The University of Waterloo has a contract with a third-party international travel safety and security provider in order to deliver real-time safety and security information and, when necessary, support to University of Waterloo members. Since 4 September 2019, the University’s third-party international travel safety and security provider has been the Anvil Group (Anvil). Information about how University of Waterloo students, staff and faculty can make use of Anvil’s services may be found on the Safety Abroad webpages at <https://uwaterloo.ca/international/travel-safety-and-security>.

International Education Week

International Education Week is a global celebration occurring this year from 18-22 November 2019. Planning for the University of Waterloo's engagement in International Education Week is well underway. Those wanting to find out more can visit the webpage at <https://uwaterloo.ca/international/international-education-week>.