University of Waterloo
SENATE
Notice of Meeting

Date: Monday 15 April 2019
Time: 3:30 p.m.
Place: Needles Hall, room 3407

<table>
<thead>
<tr>
<th>OPEN SESSION</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30 Consent Agenda</td>
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<tr>
<td>Motion: To approve or receive for information by consent items 1-5 below.</td>
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<tr>
<td>1. Minutes of the 25 March 2019 Meeting</td>
<td>Decision</td>
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<tr>
<td>2. Reports from Committees and Councils</td>
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<tr>
<td>a. Graduate &amp; Research Council</td>
<td>Information</td>
</tr>
<tr>
<td>b. Undergraduate Council</td>
<td>Decision/Information</td>
</tr>
<tr>
<td>3. Report of the President</td>
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<tr>
<td>a. Recognition and Commendation</td>
<td>Information</td>
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<tr>
<td>5. Reports from the Faculties</td>
<td>Information</td>
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| Regular Agenda | |
| 3:35 6. Business Arising from the Minutes | |
| 3:40 7. Presentations | |
| a. Bryan Tolson, President, Faculty Association of University of Waterloo | Information |
| b. Beth Sandore Namachchivaya, University Librarian | Information |
| 4:10 8. Reports from Committees and Councils | |
| a. Executive Committee* | Decision |
| b. Graduate & Research Council | Decision |
| c. Undergraduate Council | Decision |
| 4:25 9. Report of the President | Information |
| 4:40 10. Q&A Period with the President | Information |
| a. Undergraduate & Graduate Admissions Update | Information |
| 5:00 12. Report of the Vice-President, University Research & International | Information |
| 5:05 13. Other Business | |

| CONFIDENTIAL SESSION | |
| 5:10 14. Minutes of the 25 March 2019 Meeting | Decision |
| 15. Business Arising from the Minutes | |
| 5:15 16. Report of the President | Information |
| 5:25 17. Other Business | |

Karen Jack
University Secretary
Secretary to Senate
University of Waterloo  
SENATE  
Minutes of the 25 March 2019 Meeting


Guests: Bruce Campbell, Robin Cohen, Madison Cox, Donna Ellis, Giuseppe Femia, Erin Gillespie, Ross Johnston, Andrea Kelman, Jennifer Kieffer, Nick Manning, Beth Palmer, Diana Parry, Ian Rowlands, Emily Schroeder, Daniela Seskar-Hencic, Jason Small, Allan Starr, Brandon Sweet


*regrets
**joined by telephone

OPEN SESSION

The chair welcomed members to the meeting.

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

O’Connor and Karigiannis.

1. MINUTES OF THE 25 FEBRUARY 2019 MEETING
Senate approved the minutes of the meeting.

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

3. REPORT OF THE PRESIDENT
   a. Recognition and Commendation. Senate received the report for information.

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

The question was called, and the motion carried unanimously.

Regular Agenda
5. **BUSINESS ARISING FROM THE MINUTES**
   Casello provided a brief update on graduate admissions and recruitment, and indicated that he will provide a more detailed report at April’s Senate meeting.

6. **REPORTS FROM TEACHING AWARDS COMMITTEES**
   Coniglio and Casello spoke to the awards, and introduced those winners in attendance at the meeting. A round of applause followed, as did personal congratulations from the chair. Hamdullahpur also recognized and offered kudos to the recipients of the Feds Teaching Awards.

   **Amit & Meena Chakma Awards for Exceptional Teaching by a Student Committee**
   Senate received the report for information.

   **Distinguished Teacher Awards Committee**
   Senate received the report for information.

7. **PRESENTATIONS BY STUDENT FEDERATION/ASSOCIATION PRESIDENTS**
   **Richard Wu, President, Federation of Students**
   Wu provided an update on the activities which the Federation of Students has been involved over the past year, including: an overview of clubs, services and societies; recent advocacy work at the university, local, provincial and federal levels; milestones. He finished with an introduction of the incoming executive team. Hamdullahpur thanked Richard for his service as president.

   **Naima Samuel, President, Graduate Student Association**
   Samuel provided an update on the Graduate Student Association’s activities over the past year and plans for the future, including: an overview of the association’s structure; its priorities, services, projects, collaborations, and upcoming projects. Members heard that Samuel’s term as president has been renewed for another year. Hamdullahpur thanked Samuel for her leadership.

8. **REPORTS FROM COMMITTEES AND COUNCILS**
   **a. Finance Committee.**
   Senate heard the following motion:

   That Senate recommend that the Board of Governors approve the 2019/20 Operating Budget, as described in Attachment 1.

   Andrey and Watt.

   Rush provided an overview of the proposed operating budget for 2019/20. Members heard: projections for revenue and expenses; the proposed operating income and expense budgets; revenue sources; the budget model allocations; an ongoing contribution from the ancillary enterprises, and a one-time contribution from the Faculties will help keep an anticipated deficit at approximately $900K.

   Questions were raised and discussion occurred re: the increase in international students and how we are evolving to meet their needs; how the one-time funding amount from the Faculties was decided. Members heard that a copy of the presentation slides will be posted to the Senate SharePoint site.

   The question was called and the motion carried unanimously.

   **b. Graduate & Research Council**
   Senate heard the following motions:
To approve the dissolution of the Centre for Ecosystem Resilience & Adaptation in 2019—with the Centre account remaining open until the end of fiscal year 2019, as presented in Attachment 1.

Casello and Andrey. Carried unanimously.

To approve the revision to four Master’s and three PhD programs within the Department of Chemical Engineering by replacing the core course list with prescribed courses foundational to the discipline and introducing a mandatory seminar-based (half) course focused on research methods and ethics training, effective Fall 2019, as presented in Attachment 2.

Casello and Sullivan. Carried unanimously.

9. REPORT OF THE PRESIDENT
The president provided Senators with an update on recent activities and matters. Members heard: Lili Liu’s appointment as the Dean of Applied Health Sciences beginning 1 July 2019 was confirmed by the Board; the University recently hosted a successful Waterloo Innovation Summit event in the United Kingdom; a provincial and federal government relations update, and an update on the strategic plan process and coming milestones.

10. Q&A PERIOD WITH THE PRESIDENT
In discussion: questions about the provincial budget to come; unknown future changes to the pending third strategic mandate agreement.

11. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST
Rush provided a brief update on the student experience review and heard a question about the proposed changes articulated in a recent memo re: class sizes in stand-alone communication courses relating to English language competency. Rush advised that he is considering the feedback he has received and is working on a solution which recognizes the concerns raised.

12. REPORT OF THE VICE PRESIDENT, UNIVERSITY RESEARCH & INTERNATIONAL
Senate received the report for information. Dean spoke to several research initiatives and was invited to provide more detail about her office’s research plan at a future meeting.

13. OTHER BUSINESS
There was no other business.

Senate convened in confidential session.

26 March 2019
Karen Jack
University Secretary
CONFIDENTIAL SESSION

The confidential meeting minutes have been removed.
Senate Graduate & Research Council met on 18 March 2019 and agreed to forward the following items to Senate for information as part of the consent agenda.

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

FOR INFORMATION

CURRICULAR SUBMISSIONS
On behalf of Senate, council approved course revisions, course inactivation, and minor program revisions for the Faculty of Applied Health Sciences (school of public health and health systems).

RENEWAL OF CENTRES AND INSTITUTES
On behalf of Senate, council approved the renewal, for a 5-year term, of the Waterloo Centre for Germanic Studies, as presented.

OFFICE OF RESEARCH
On behalf of Senate, council approved the following Clinical Research Ethics Committee continuing membership item: (1) new member knowledgeable in law, for a 3-year term.

GRADUATE AWARDS
On behalf of Senate, council approved the Bhattacharyya Family Graduate Award (endowment), Perimeter Institute (PI) Residency Graduate Scholarship (trust), and Agibcona Masters of Mathematics for Teachers Award (trust).

/ks

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

Charmaine Dean
Vice President, Research & International
Senate Undergraduate Council met on 12 March 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

FACULTY REGULATION CHANGES
Faculty of Applied Health Sciences

Department of Kinesiology – Admission Requirements

1. Motion: That the admission requirements for the Bachelor of Science, Kinesiology, be revised as follows, effective 1 September 2020.

Background and Rationale:
The following change to the admissions requirements is proposed (strikeout = deleted text; bold = new text):

Required courses:
- Advanced Functions 4U - a minimum final grade of 70 is required
- Chemistry 4U - a minimum final grade of 70 is required
- any English 4U - a minimum final grade of 70 is required

One of the following:
- Biology 4U - a minimum final grade of 70 is required
- Physics 4U - a minimum final grade of 70 is required

Rationale: Adding the Grade 12 English requirement will improve student success in the Bachelor of Science, Kinesiology program. Writing and communication are a significant component of the assessments in the courses for the program, and students with a minimum final grade of 70 in Grade 12 English would be more adequately prepared. This change to admissions requirements to include any ENG4U is consistent with all other University of Waterloo undergraduate program requirements.

Faculty of Applied Health Sciences

School of Public Health and Health Systems – Admission Requirements

2. Motion: That the admission requirements for the Bachelor of Science, Honours Health Studies, be revised as follows, effective 1 September 2020.

Background and Rationale:
The following changes to the admissions requirements are proposed (strikeout = deleted text; bold = new text):
Required courses:
- Biology 4U - a minimum final grade of 70 is required
- Chemistry 4U - a minimum final grade of 70 is required
- any 4U English - a minimum final grade of 70 is required
- any 4U Math - a minimum final grade of 70 is required

Rationale: Adding a Grade 12 English and math requirement will improve student success in the Bachelor of Science, Honours Health Studies program. Writing and communication are a significant component of the assessments in the courses for the program, and students with a Grade 12 English course would be more adequately prepared. There are also several data science courses in the curriculum (HLTH 204, HLTH 230, HLTH 333, other methods-focused courses) which require skills in mathematics and quantitative approaches. These changes to admissions requirements are consistent with most other health sciences program requirements.

Faculty of Applied Health Sciences

School of Public Health and Health Systems – Admission Requirements

3. Motion: That the admission requirements for the Honours Bachelor of Public Health, be revised as follows, effective 1 September 2020.

Background and Rationale:
The following change to the admissions requirements is proposed (strikeout = deleted text; bold = new text):

Required courses:
- Any Grade 12 English - a minimum final grade of 75 is required
- any 4U Math - a minimum final grade of 70 is required

Rationale: Adding a Grade 12 math requirement will improve student success in the Bachelor of Public Health program. There are several data science and epidemiology courses in the curriculum (HLTH 204, HLTH 230, HLTH 333, STAT 316, and other methods-focused courses) which require skills in mathematics, coding, and quantitative approaches. A strong grounding in mathematics will also better prepare students for employment in the field of public health as skills and competency in mathematics and quantitative analysis are required.

Faculty of Arts

Academic Standing Definition

4. Motion: That the academic standing definition for the Faculty of Arts be revised as follows, effective 1 September 2020.

Background and Rationale:
The current text can be found at: [http://ugradcalendar.uwaterloo.ca/page/ARTS-Academic-Standing-and-Averages](http://ugradcalendar.uwaterloo.ca/page/ARTS-Academic-Standing-and-Averages)

Text with revisions inline (strikeout = deleted text; bold = new text):

Students who meet the academic requirements for their major will be in Excellent, Good, or Satisfactory standing, depending on the major and their term and overall averages. Failure to meet minimum average requirements for the major may result in a Conditional or a Failed standing (see Note 3).
Students can find their term grades in Quest and academic standing on their unofficial transcripts.

Notes
1. For Laurier courses, see Wilfrid Laurier University Cross-Registration.
2. Students who have received transfer credit(s) or had grades cleared should refer to Transfer Credit for further details.
3. Even while otherwise in satisfactory standing, a student who fails two or more academic courses within the first five academic course units or fewer may be required to withdraw if the Arts Examinations and Standings Committee considers that the student will not profit by further study.

Rationale: See Rationale under Motion 5 below re: addition of new text.

Faculty of Arts

Non-Degree Students

5. Motion: That the academic standing regulations for non-degree students be revised as follows, effective 1 September 2020.

Background and Rationale:
The current text can be found at: [http://ugradcalendar.uwaterloo.ca/page/ARTS-Non-Degree-Students-1](http://ugradcalendar.uwaterloo.ca/page/ARTS-Non-Degree-Students-1)

Text with revisions inline (strikeout = deleted text; bold = new text):
To be in satisfactory standing, a non-degree student must maintain a minimum cumulative overall average of 60% and a minimum cumulative Faculty of Arts average of 65%.

Even while otherwise in satisfactory standing, a student who fails two or more academic course units within the first five academic course units or fewer may be required to withdraw if the Arts Examinations and Standings Committee considers that the student will not profit by further study.

Non-degree students may take no more than 10 academic course units at the University of Waterloo without permission of the Arts Examinations and Standings Committee.

In the following instances, a student can be registered as a non-degree student yet receive no academic standing decision:

1. Students from other universities studying on a Letter of Permission basis;
2. Students from other universities studying on an approved international exchange;
3. Students who elect to proceed with studies despite having been assigned a Failed - required to withdraw standing decision in the previous term.

Non-Degree Conditional
To be considered for admission to degree studies, students admitted on a non-degree conditional basis must:

- successfully complete a minimum of four Arts courses, and
- achieve an average of 65% or above in all Arts courses taken with no failures.

Clean text:
To be in satisfactory standing, a non-degree student must maintain a minimum cumulative Faculty of Arts average of 65%.
In the following instances, a student can be registered as a non-degree student yet receive no academic standing decision:
1. Students from other universities studying on a Letter of Permission basis;
2. Students from other universities studying on an approved international exchange;
3. Students who elect to proceed with studies despite having been assigned a Failed - required to withdraw standing decision in the previous term.

**Rationale:** To revise the Calendar text regarding academic standing for non-degree students. The criterion for being admitted to a non-degree conditional term is when a student fails two or more academic course units within their first year. This note is being relocated to the Academic Standing Definition page. The other text being removed is not a correct reflection of our current practices.

**Faculty of Environment**

**Examinations and Standings – Residency Rule**

6. **Motion:** That the residency rule outlined below be removed from the calendar, effective 1 September 2018.

**Background and Rationale:**

Text with revisions inline (strikeout = deleted text; bold = new text):

Generally, students wishing to graduate with a University of Waterloo Bachelor of Environmental Studies (BES) or a Bachelor of Knowledge Integration (BKI) undergraduate degree must have been enrolled as a Faculty of Environment student for a minimum of half of their degree requirements.

Rationale: This rule contradicts the University’s residency rules and does not reflect the true practice within the Faculty. The registrar’s office approved retroactive removal if approved.

**REGISTRAR’S OFFICE**

7. **Motion:** That Senate endorse the Senate Undergraduate Council curricular submission guidelines as presented, effective 1 April 2019.

**Curricular Submissions Guidelines**

Senate Undergraduate Council and Undergraduate Operations considered a set of guidelines regarding approvals of calendar changes and curricular submissions. The intent of the guidelines is to provide more clarity around which items are more academic in nature requiring Council’s and/or Senate’s approvals, and which are more operational in nature and more properly for consideration at Undergraduate Operations. Clarity around these points will assist with focusing discussions at each body. See Attachment #1.

**FOR INFORMATION**

Final Assessment Report – Applied Mathematics, Computational Mathematics, Combinatorics and Optimization, Pure Math. Council’s reviewers were pleased with responses to questions and comments on the report. Following discussion, Council approved the final assessment report on behalf of Senate. See Attachment #2.
Council’s reviewer was pleased with responses to questions and comments, and noted progress made to address findings. Members discussed the importance of this area of study, and ways to increase enrollment in the option (noting that individual course offerings are very popular). Following discussion, Council approved the two-year progress report on behalf of Senate. See Attachment #3.

MINOR PLAN & CURRICULAR MODIFICATIONS
Council approved the following on behalf of Senate:

- minor plan changes for the faculties of applied health sciences (rehabilitation sciences minor, recreation and sport business, honours tourism development, tourism option, honours bachelor of public health); engineering (mechanical engineering, mechatronics engineering); environment (environment and business, geography and aviation, geography and environmental management joint honours, geomatics joint honours, environment, resources and sustainability, geomatics, international development, planning, parks option, tourism option); mathematics (honours actuarial science, joint actuarial science, actuarial science minor, professional risk management specialization); science (honours chemical physics (reg. and co-op), honours life physics – biophysics specialization (reg. and co-op), honours life physics – medical physics specialization (reg. and co-op), honours materials and nanosciences (reg. and co-op)); software engineering.

- new courses for the faculties of applied health sciences (kinesiology, recreation and leisure studies); arts (religious studies, Jewish studies, Italian studies, studies in sexuality, marriage and the family); engineering (mechanical engineering, mechatronics engineering, business, entrepreneurship and technology); mathematics (actuarial science); and Renison University College (English language studies).

- course changes for the faculties of applied health sciences (School of Public Health and Health Systems, kinesiology, recreation and leisure studies); engineering (mechatronics engineering, business, entrepreneurship and technology); environment (School of Environment, Resources & Sustainability, knowledge integration, School of Environment, Enterprise & Development); mathematics (actuarial science, computer science, mathematics, pure mathematics, statistics); science (biology, chemistry, pharmacy, physics); and Renison University College (bridge to academic success in English, English for academic success, social work).

- course inactivations for: the faculties of applied health sciences (recreation and leisure studies); mathematics (actuarial science); science (biology, physics).

Mario Coniglio
Associate Vice-President, Academic
Memorandum

To: Senate Undergraduate Council
From: University Registrar
Date: February 27, 2019
Re: Undergraduate curriculum submission guidelines

Motion: To accept the amendment to the approval guidelines that were approved on November 23, 2018 so that the whole document can be submitted to Senate.

Effective (revised): May SUC meeting

Amendment: Moving the following item from the “Requires SUC Approval” category to the “Operational – does not require SUC approval”
- Changing contact hours*
  - For submission purposes, details should appear in the course report rationale

Rationale for amendment: After November’s approval, further discussion occurred regarding “contact hours”. It has been determined since this item isn’t visible to members of the campus community and can’t be enforced, there is no longer a desire to send revisions to SUC for approval.

Approved Guidelines with amendment:

Senate Undergraduate Council (SUC) approves academic requirements, admission requirements, and rules/regulations. Operational matters are more appropriately considered by the Undergraduate Operations Committee.

Hyperlinks lead to current examples in the UG Calendar

<table>
<thead>
<tr>
<th>Requires SUC Approval</th>
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<tbody>
<tr>
<td>Courses – includes, but not limited to:</td>
</tr>
<tr>
<td>- Creating</td>
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<tr>
<td>- Reactivating</td>
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<tr>
<td>- Inactivating</td>
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<td>- Changing a subject code/rubric (e.g., BIOL, CIVE, HRTS, PSYCH)</td>
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<td>- Changing a number (and adding associated formerly notes and antirequisites)</td>
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<tr>
<td>- Changing a unit weight</td>
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<td>- Changing a title (long and/or short)</td>
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</table>
  - For submission purposes, short title should appear in the course report rationale |
- Changing a description
- Adding/removing components*
- Changing grading basis (e.g., numerical vs CR/NR vs no credit)* - recommend listing in a note for each applicable course
- Changing passing grade (e.g., pass 60)* - recommend listing in a note for each applicable course
- Changing requisite field (adding, changing, removing any of: prereq, coreq, antireq)
  - Exception: removing inactivated courses from a list (see Editorial)
- Adding/removing cross-listings
- Adding/removing consent – instructor or department*
- Adding/removing attributes (location/method of offering) – appear in italics after requisites*
- Changing final examination requirement (y/n in Quest)
  - For submission purposes, final exam details should appear in the course report rationale
- Adding/changing/removing contractual/academically material preface notes (i.e., notes appearing at the top of course description pages)
- Adding/changing/removing contractual course description notes (appear in square brackets)*:
  - Type of prerequisite that can’t be coded in Quest (e.g., FR 151)
  - Fees (e.g., field trip, ancillary)
  - Topic rules / repeat rules
  - Mandatory attendance during first week
  - Applicability to program/plan requirements

**Academic requirements – includes, but not limited to:**
Note: Academic Advisement templates should not be included in submission packages to SUC
- Creating programs/plans
- Inactivating programs/plans
- Changing requirements for programs/plans (incl. co-op)
- Program/plan name changes
- Non-academic requirements that require tracking for degree completion (e.g., via a milestone, but not the “milestone” itself)
  - Note: Avoid including text that defines how the student information system will record completion of a requirement
- Motions considered as “major modifications” by Quality Council, such as:
  - Significant change to learning outcomes
  - Introduction/removal of co-op
  - Adding/changing program/plan to offered fully online
  - Changing the location of offering for an existing program
- University-level regulations (create/change/inactivate)
- Faculty-level regulations (create/change/inactivate)
- Study/work sequences (co-op): changing or rearranging # of work terms/study terms
- Undergraduate portion of an accelerated masters (new/change/inactivate) – SGRC approval also required
- Articulation agreements:
  - Creating articulation agreement
  - Changing number of transfer credits / progress
  - Changing admission requirements
  - Changing affiliated program’s name
  - Changes due to major modifications that occurred to affiliated program
International agreements (e.g., China 2+2): Need to be reapproved if UW courses are now offered overseas (major modification)

**Undergraduate Calendar content — includes, but not limited to:**
- Admission requirements
- Academic dates (incl. Convocation dates) – SGRC approval also required
- Terms in Glossary (if academic and University-wide)

* Previously agreed to by SUC (May 2010 meeting) as not requiring SUC approval

Note: If material to the initial decision, changes to passed effective dates or corrections to approved motions should go back to SUC for approval.

**Operational – Does not need to go to SUC**
Defined as:
- Items where determination is made at a later time (e.g., scheduling)
- Behind-the-scenes coding (not visible in the Undergraduate Calendar)
- May not appear on existing course reports to SUC

Communication between faculties and other units (e.g., CECA) still needs to occur, where applicable.

**Courses – changing course characteristics**
Note: Submit to SA Catalog administrator
- Creating or inactivating a subject code/rubric (e.g., getting HRTS into Quest so reports can be generated for SUC)
- Changing contact hours*
- Changing ownership of a course subject (i.e., header on course report)
  - E.g., JS previously owned by Dean of Arts, now owned by Religious Studies

* Previously agreed to by SUC (May 2010 meeting) as not requiring SUC approval

**Undergraduate Calendar content maintained by RO**
- Course enrolment dates determined by Office of the Registrar, within established guidelines (e.g., drop/add, course selection)

**Editorial – Does not need to go to SUC**
Defined as edits that are non-contractual in nature and have no academic impact on the requirements a student must follow.

Communication between faculties and other units (e.g., CECA) still needs to occur, where applicable.

**Courses**
Note: Submit to SA Catalog administrator
Note: Approval authority is delegated from SUC to Faculty Councils.
- Adding/changing/removing non-contractual/academically immaterial *preface notes* (i.e., notes appearing at the top of course description pages)
- Changing non-contractual/academically immaterial course description notes (appear in square brackets)*:
  - **Term of offering** (e.g., W,S)
  - Fees (updating the amount)
  - **Formerly notes** (e.g., when a course has been renumbered)
  - Other non-academic notes, such as:
    - Describes what **type of course** it is
- Provides information helpful during course enrolment
- Adding clarifying text for previously approved practices (e.g., IP grades spanning multiple terms)
- Removing inactivated courses from courses notes (after a recommended period of 5 years)
- Removing inactivated courses from requisites (after a recommended period of 5 years)*
- Removing formerly notes, e.g., when a course had been renumbered (after a recommended period of 5 years)

**Academic requirements**

Note: Approval authority is delegated from SUC to Faculty Councils.

- The following should be submitted to SUC in a yearly report to the March meeting (once the UG Calendar is published):
  - Removing previously inactivated courses from requirements
  - Updating course numbers in requirements list for previously-approved renumbered courses
  - Updating course titles in requirements list for previously-approved retitled courses
  - Updating previously-approved cross-listed courses in requirements (e.g., add the new cross-list offering or remove the deleted cross-listing)
  - Changing when a course is offered (e.g., 3B to 3A) when requirements are displayed in a **term-by-term recommended sequences**
- Choosing to add or remove course titles in requirements
- Articulation agreements:
  - Updating course number in program (e.g., due to change from another unit), but course content did not change
  - Updating course title in program (e.g., due to change from another unit), but course content did not change

**Undergraduate Calendar content**

Note: Approval/change/remove terms in Glossary (if not academic)

- Add/change/remove terms in Glossary (if not academic)
- Reorganizing existing content (incl., removing repeated text from several locations into one area)
- Non-contractual edits to non-faculty owned content
- Amalgamating or splitting up existing text
- Fixing typographical errors
- Changing the Table of Contents / navigation structure
- Changing/removing overview/introduction/preamble/non-contractual faculty information – usually occurring at the department or plan level
  - E.g., for Nanotech Engineering, everything appearing before “Admissions” heading
- Changing dates from year to year (e.g., 2018-2019 to 2019-2020)
- Updating any Laurier information to remain current
- Updating office/department names (internal or external to UWaterloo)
- Updating form names
- Updating hyperlinks

* Previously agreed to by SUC (May 2010 meeting) as not requiring SUC approval

When questions arise regarding the contractual/material nature of a motion, the Chair of Senate Undergraduate Council has the authority to make a determination (with consultation with the Secretariat and the Office of the Registrar, where applicable).

**Rationale and background:**
In accordance with Senate Bylaw 2, the Powers and Duties of Senate Undergraduate Council are as follows:

The Undergraduate Council shall consider all questions relating to the academic quality of undergraduate studies within the university and, without intending to restrict the generality of the foregoing, the Undergraduate Council shall,

1. Make recommendations to Senate with respect to rules and regulations for the government, direction and management of undergraduate studies in the university.
2. Make recommendations to Senate with respect to new undergraduate programs/plans, the deletion of undergraduate programs/plans, and major changes to undergraduate programs/plans.
3. On behalf of Senate, consider and approve all new undergraduate courses, the deletion of undergraduate courses, and proposed changes to existing undergraduate courses and minor changes to programs and/or plans, and provide Senate with a summary of council's deliberations in this regard. Any matter of controversy that might arise may be referred to Senate.
4. ...

In spring 2010, UOPs and SUC identified and approved a list of routine changes that could be approved at the Faculty level only and not require SUC approval. The Office of the Registrar and the Secretariat have collaborated to review and better clarify guidelines to qualify SUC submissions.

Current systems limit how course items appear on reports – not always easy to pull apart depending on the approval flow. As such, some items may still appear on reports to SUC, even though that body’s approval is not required. Faculties have agreed to indicate when an item does not require approval.
February 26, 2018

To Whom it May Concern:

The Faculty of Mathematics endorses the February 2018 Final Assessment Report for Applied Mathematics, Computational Mathematics, Combinatorics and Optimization and Pure Mathematics.

Let me again express my appreciation for the efforts of your office, the Math Undergraduate Office, the program directors and the departments have invested in the preparation for the final assessment report.

As previously discussed, the outcome of the reviewers’ visit had many problematic aspects. In particular, the reviewers’ report had factual errors, and it opines on matters outside the scope of the review (and therefore for which no information was provided).

Despite this, the Office of Academic Integrity, the department heads and program director responsible for these programs have tried to extract as much useful insight as can be gleaned from the report. I find the final assessment report for these programs and the implementation plan to be thoughtful and completely appropriate under the circumstances.

Sincerely,

Stephen M. Watt, Dean
Faculty of Mathematics
Final Assessment Report
Applied Mathematics, Computational Mathematics, Combinatorics and Optimization, Pure Math (BMath)
October 2018

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 Applied Mathematics, Computational Mathematics, Combinatorics and Optimization and Pure Math (BMath) programs delivered by the Faculty of Math. A self-study (Volume I) for each program was prepared and submitted to the Associate Vice-President, Academic. Each self-study presented the program’s description and learning outcomes, an analytical assessment of the program, and program data, including a standard data package prepared by the Office of Institutional Analysis & Planning (IAP). Appended to each report were the course outlines for all the courses in the program, and the CVs (Volume II) for each full-time faculty member associated with the on-going delivery of the program.

Two arm’s-length external reviewers were selected by the Associate Vice-President, Academic from Volume III: Dr. Michael Lamoureux, Professor of Mathematics, University of Calgary; and Dr. Mary Pugh, Professor of Mathematics, University of Toronto. In addition one internal reviewer, Dr. Michael Dixon, Professor of Psychology at the University of Waterloo was selected by the Associate Vice-President, Academic.

They reviewed the self-study documentation and then conducted a site visit to the University on July 18-19, 2016. The visit included interviews with the Associate Vice-President, Academic; Dean of the Faculty; Faculty Associate Dean of Undergraduate Studies, Chairs and Directors of the Departments, Faculty members, staff and meetings with a group of current undergraduate students.

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:

Applied Mathematics focuses on the development of a variety of differential equation-based models. These yield mathematical and computational descriptions of dynamic phenomena: from the motion of ocean waves, to the control of aircraft flight, to the volatile price of stock options. The Applied Mathematics plan builds on the fundamental courses in calculus and linear algebra and offers a variety of core courses in ordinary differential equations, partial differential equations, and computational mathematics. These courses, along with an introduction to physics, provide a foundation for modeling across a wide range of domains.

**Combinatorics and Optimization** (Combinatorics and Optimization, Mathematical Optimization, Mathematical Optimization – Business Specialization, Mathematical Optimization – Operations Research Specialization)

Combinatorics is the study of discrete structures. Since computers work with discrete objects, this subject is becoming increasingly important in our digital age. Optimization is the problem of minimizing or maximizing functions subject to a set of constraints.

The department offers two undergraduate Honours programs, namely a program in “Combinatorics and Optimization” and a program in “Mathematical Optimization”. The first Honours program emphasizes both subjects equally. It is natural to teach both topics together as Combinatorics and Optimization are complementary subjects. Problems in Combinatorics have an Optimization counterpart and combinatorial tools are needed to solve discrete optimization problems. The second Honours program (Mathematical Optimization) provides a strong foundation in the field of optimization. That program has two options, namely, Operations Research and Business; the latter one is tailored to Math Business students.

**Computational Mathematics**

Mathematical models arise in a wide variety of fields: business, economics, engineering, finance, medicine, science, and many others. The application of computer methods to simulate such models was traditionally called “scientific computation,” though the practice has spread far beyond its roots in science to encompass problems arising in all areas of society. The results of such simulations are numerical answers, formulae, data sets, plots, charts, and images that help us to understand the nature of the world around us, and allow us to predict and influence the future.

Developing and analyzing such models involves a blend of mathematics and computer science. It includes issues such as the implications of finite precision arithmetic, the efficiency, accuracy, and stability of numerical computations, the development and maintenance of mathematical software, and the effects of modern developments in computer architectures and networks.

**Pure Mathematics**

Pure Mathematics comprises a broad spectrum of mathematics. Interests of the Department include algebra, logic, number theory, analysis, geometry and topology, and range from the very classical to the most modern.

Pure Mathematics programs focus on developing students’ knowledge and understanding of fundamental areas of mathematics. Our students develop outstanding analytical and problem-solving skills. They are trained to think logically, critically and creatively, and to write clear, rigorous arguments.
There are also a number of joint programs: Joint Applied Mathematics, Joint Combinatorics and Optimization, Joint Pure Mathematics, as well as, four associated minors: Applied Mathematics Minor; Combinatorics and Optimization Minor; Computational Mathematics Minor; Pure Mathematics Minor.

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

**Applied Mathematics**

**Strengths**
- Small class sizes in third and fourth year
- Large number of specialized courses related to research areas of faculty members offered in third and fourth year
- Many students have the opportunity for one or more undergraduate research terms
- Large percentage of strong students
- Co-op program is healthy with good placement rate

**Challenges**
- Although not seen in the data given, there are indications that enrolment in our Mathematical Physics plan is decreasing as more students choose the Physics version over the Applied Math version
- Students only enroll in Applied Math in second year, however our degree requires that they take one or more first year Physics courses. We need a way to identify and contact potential students earlier in their program
- Diversity of students in our required courses: Applied Math students, Physics students and Math students other than Applied Math. The majority of those enrolled may not be Applied Math students.

**Weaknesses**
- Overall enrolment is low

**Combinatorics and Optimization**

**Strengths**
- The Honours program in Combinatorics and Optimization is unique among North American institutions at the undergraduate level.
- With over thirty full-time professors the department has an unmatched concentration of researchers and instructors in Combinatorics and Optimization
Challenges

- Few high schools and first-year undergraduate students have heard of Combinatorics or Optimization. This is in sharp contrast with other areas of studies such as Computer Science or Business.

Computational Mathematics

Strengths

- The biggest strength of the program is breadth. This is also the most prominent distinction from other programs offered in the Faculty of Mathematics.
- The large number of affiliated members from Mathematics, Engineering, and Science Faculties (over 50 in total), gives a broad exposure of subjects to students. Not many programs on campus have the same scale of diversity
- Students receive training in a broad set of skills that well prepare them for future jobs or studies.

Challenges/Weaknesses

- Recruitment of students can be challenging as it is not always clear how computational mathematics is different from mathematics and computer science.
- All of the undergraduate courses are offered through other departments/schools; hence, the program lacks control over the offering and scheduling of the undergraduate courses.
- The number of computational math students in any of these courses is often quite small. As such, it is very possible for a computational math student to go through the program and never meet any other students within the program.
- The day to day advising of the Computational Mathematics program is run from the Mathematics Undergraduate Office. Unfortunately, this causes a disconnect from the people administering the program, and the people responsible for maintaining the program.

Pure Mathematics

Strengths

- The quality of the Pure Mathematics Major program and the challenge it provides to even the best students in the Mathematics Faculty is one of the great strengths of the program. This is attested by the fact that their students win major external awards and are admitted to the premier graduate schools.
- Pure Mathematics is known throughout the Faculty to have outstanding teachers, with 5 of the 23 faculty members having won teaching awards.
Challenges/Weaknesses

- Due to the small size of the department, they are not able to offer the frequency and variety of courses that might be possible in larger mathematics departments.

- The size of NSERC grants in mathematics limits the number of research opportunities they are able to offer to their students. They generally have more interested and talented students than they can fund.

Summary of key findings from the external reviewers:

Waterloo is very successful at attracting top students from across Canada into its mathematics programs, and thus it can be highly selective in choosing to admit only the most competitive applicants with high grades and excellent achievements on contest exams. Generally speaking, all the programs reflect a strong, traditional approach to mathematical training with foci on central, important topics. However, there are some gaps in the curriculum between the programs that the Departments, as a group, need to identify and fill where appropriate.

Attrition rates seem to be impressively low. The vast majority of students complete their degree at Waterloo, although there is quite a bit of movement between programs before completion (which indicates healthy options available for the students). Reviewers noted that some students moved on to top schools for graduate studies, including University of California Berkeley, Cambridge, Chicago, Columbia, Harvard, MIT, Stanford and Toronto. Other recent graduates of the UW math undergrad programs include a Clay Fellow at Stanford, a Moore Instructor at MIT, a PDF at Princeton, and a winner of the CMS Doctoral Prize which are all very notable accomplishments for the student body.

In addition, most of the faculty members are active in the larger, international research community. They participate in conferences and workshops, organize similar events, collaborate broadly, and are active in organizations relevant to the discipline (e.g. the Canadian Mathematical Society, the Canadian Applied and Industrial Mathematics Society, the American Mathematical Society, etc.). This keeps the faculty at the forefront of current research and scholarship, ensuring the students are taught by professors aware of the latest developments in the discipline.

Program response to external reviewer recommendations:

Recommendations

1. Significant effort must be made to improve the information and advice provided to potential and current undergraduate students in the programs in mathematics, whether that be through online resources and webpages, or in-person advising. The wide variety of math programs offered from these four units should be presented as a cohesive unit that students can enter with confidence. Currently, online information on what programs are available and their requirements is spread across many webpages, presenting a confusing matrix of data for the students to sort through. Some programs are described in various Department webpages, others in the Faculty’s webpages,
and many details are explained in University documents. In particular, Computational Mathematics being independent of Departments does not appear in any prominent way in the online documentation. Some information on possibilities and expectations (such as the option to take graduate courses while an undergrad, or to take a minor outside the Faculty) seems to be absent altogether.

The Departments state that they do not have the resources to do one-on-one advising with all students. Even if such advising were available, it would have to be complemented by clear, easy-to-understand documentation on proper program information which would allow students to explore their options and formulate their questions. It is strongly recommended program documentation for students be revised and clarified for student use. Such documentation could include student profiles of real (or hypothetical) students including the generic student who came in with top grades and went through the programs with the goal of going to graduate school in math, the “good at everything” student who came in with top grades and either needed to discern a single focus or chose to focus on two subjects, the “Renaissance/Non-standard” student who came in with top grades and wants to study both computer science and psychology, the “challenged” student whose path through university has had bumps in the road and how they kept on track and so forth. One does see student profiles if one clicks on the “Future Undergraduates” link of the Faculty of Mathematics page but current undergraduates wouldn’t be looking there.

**Response**

With respect to the portion of the recommendation relating to one-on-one advising, we would like to clarify that all four academic units do provide one-on-one advising to all students interested in their programs. In addition to this, there are regular “info nights” to inform students about the possible programs. We believe these measures address that part of the recommendation.

With respect to the portion of the recommendation concerning departmental and faculty websites, there are already processes in place to improve, maintain and update these webpages. For example, Jodi Szimanski (Director, Strategic Communications) is responsible for all faculty level webpages and these have been recently revised to include more information that is helpful for the undergraduate students. As another example, the Pure Math department hired a graduate student for Winter 2017 to overhaul all of the Pure Math related webpages. The responsibility for the pages for Computational Mathematics is held jointly by the Director (Jeff Orchard) and the administrative assistant (Amanda Guderian) and recently (Fall 2015) underwent major revisions. The other two units are similar. We expect that these processes are sufficient to address this recommendation.

2. We encourage the Departments and Faculty to reconsider the program entrance requirements. While the emphasis on contest exams scores (in conjunction with high school grades) has served
the Departments well in selecting highly competitive, performance-focused students who will succeed in the program, it also may bias against creative, mathematically talented individuals who don't necessarily like competition. This does not serve the wider community of potential students who could have a full and productive career in mathematics. We understand that the math competitions and math education outreach are a vital service that the Faculty of Mathematics is providing to Canada and that, as a result, it's part of its branding. We also understand that the mandate of the University is broader than simply trying to train undergraduates who might become world-class research academics. That said, it would likely be healthier if the math competition aspect be significantly downplayed the moment students arrive at Waterloo and start the next stage of their lives.

Response
This recommendation is for something beyond the mandate of the reviewers, and outside of the mandate of the units being reviewed; admissions are handled by the Faculty of Mathematics, and math students enter into the programs under review after their first year of study.

Despite that, it is worth mentioning that the faculty has made a number of changes recently to the way that undergraduate students are admitted. All students are now required to supply a "Admissions Information Form" with their applications. This allows the students to discuss things beyond their grades and competition scores. The Faculty of Math takes these forms quite seriously, and tries to admit students who are "well-rounded" as well as being very strong academically. It has been the faculty's experience that these are the students that are most successful in University.

3. A process should be put in place to continuously update and keep current the courses and curricula in the programs. It was somewhat surprising to these reviewers to see, for instance, that the Pure Math program is almost identical to similar programs from 35 years ago. There needs to be room in the programs for modern advances. Ideally, these course reviews would be done as a team by the three Departments (Applied Math, Combinatorics & Optimization, and Pure Math). In addition, it would be wonderful if there were some sort of teaching credit mechanism by which a faculty member from one department could teach a course that is affiliated with another department. One would want to have some sort of bookkeeping to ensure that over a five year windows, say, that these teaching exchanges are fair and balanced. Also, it would be helpful if there were faculty hires who were joint hires between two departments. While joint hires can be delicate when departments have markedly different cultures and professional expectations, because Applied Mathematics, Combinatorics & Optimization, and Pure Mathematics would normally be all in a single department and so the usual difficulties that joint hires would face should be quite minimal.

Response
The recommendation was made based on incorrect information. All departments have processes in place to ensure that the programs are continuously updated and improved. In particular, all
three departments have an associate chair for undergraduate studies, (Mohammad Kohandel for Applied Math, David McKinnon for Pure Math and Ricardo Fukasawa for C&O). Part of the mandate of these associate chairs is to oversee, update and improve the undergraduate curriculum. They would also identify any gaps within the curriculum and work to remove them. The position of associate chair rotates amount the faculty, and is supported by a curriculum committee. This ensures that the program is always being kept modern, and that multiple viewpoints are always involved. The structure for Computational Math is slightly different, in that the role of the associate chair is done by the Director, in consultation with the undergraduate advisor (Martin Pei), and the role of the curriculum committee is done by the steering committee. All four units have undergone changes, sometimes minor, sometimes significant, on a regular basis as part of this process.

The reviewers were informed that this was the case and given many examples of improvements to the programs. These processes currently work well. As the programs are already doing what the recommendation asked, it is believed that no further action is required to address this recommendation.

In addition, a curriculum committee for the “core courses” has been created to look at those courses that are common to all programs within the faculty. A number of changes have already been made to the calculus stream, and they are currently looking at other core courses. This will be an ongoing committee made up of the undergraduate associate chairs, in addition to other relevant parties.

A more collaborative approach to teaching courses and hiring researchers would be a welcome change, and we are already working on developing processes to make this change possible.

4. On a related matter, a process is needed to identify and cover any gaps in the curriculum. Perhaps because of the division of math into separate departments, there seem to be some holes that are not covered in the various mathematical programs. Geometric PDE's, theoretical PDE's, mathematical probability, some modern harmonic analysis (both pure and in applications), and industrial applications are some examples that highlight the issue. To present the students with a comprehensive mathematics education, it is important to monitor the breadth across all program and ensure important fields are covered.

Response
Each department has an undergraduate committee whose purpose is to examine and renew the curriculum in each department. In addition, the Undergraduate Affairs Committee at the Faculty level is charged with the same task at a higher level. We will continue to work on providing the most excellent and broad-ranging courses that we can, given the resource constraints we must work with.
5. The university needs to also consider the issue of renewal of faculty in Pure Math and Combinatorics & Optimization. Both departments appear to be “top heavy”, especially the Pure Math department.

<table>
<thead>
<tr>
<th>Department</th>
<th>Asst. Prof.</th>
<th>Assoc. Prof.</th>
<th>Full Prof.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Math</td>
<td>4 (17%)</td>
<td>7 (30%)</td>
<td>12 (52%)</td>
</tr>
<tr>
<td>C &amp; O</td>
<td>3 (11%)</td>
<td>6 (22%)</td>
<td>18 (67%)</td>
</tr>
<tr>
<td>Pure Math</td>
<td>2 (9%)</td>
<td>4 (17%)</td>
<td>17 (74%)</td>
</tr>
</tbody>
</table>

Assuming that the time to tenure/promotion is 6 years and that the professorial career is 35 years, then one could expect 17% of the faculty to be assistant professors. In practice, one would want higher numbers than this. Junior faculty are vital for bringing in new fields, new ideas, and for shaking up the status quo (however much senior faculty might resent such disruption). Not all assistant professors get tenure. Also, strong departments will have hired so well (and supported their hires so well) that some assistant and associate professors will move to even better departments. While such losses are unfortunate to the department, they are a sign of good taste in hiring and vigour - the departing faculty member will, no doubt, have invigorated the department while they were there and will, one hopes, have left with nothing but good things to say about the department they left.

Response
As should be expected, all departments are always willing and eager to hire strong candidates. In fact, all three departments hired in 2017. In addition to these hires, the faculty is attempting to hire a junior URC as an exceptional hire. The candidate under consideration has strong ties to all three departments. The departments will continue to hire excellent and energetic junior faculty members to all three departments, as resources allow.

6. While we did not meet with any lecturers, the research faculty felt that lecturers need to be more fully integrated into departments so that they can be full participants in the delivery of the programs. For the lecturers to properly prepare the students for upper level courses, likely they need to do more than just teach first-year courses -- it might be appropriate for them to also teach the upper level courses. This would help address concerns raised about the mismatch between what is being delivered in first year courses, and what professors are needing their students to master before entering the upper years of the programs. Also, it would help if lecturers have a primary departmental affiliation. Having a departmental affiliation would, one hopes, allow them to be more fully aware of what students will need to know after their first year. Some of the research faculty expressed concerns that some of the first-year courses are not open to innovation. Running a large first-year course is a complicated, delicate job and it’s easy to imagine that once the course coordinator has “figured things out” that he/she would prefer to let the machine run without change. This is the easiest thing to do but it doesn’t allow for pedagogical
innovation or for the introduction (or elimination) of topics or the redistribution of focus on topics. Further, because there seems to be a tradition of providing lecture notes for courses, rather than having students read a textbook, there’s a risk that whoever writes the notes sets the tenor of the course. Experienced lecturers will lecture in an independent manner from the notes, providing their own vision and allowing the notes to serve as an additional resource, but inexperienced lecturers may not do so --- this makes having lecture notes instead of a book somewhat risky.

Response
There are currently ongoing discussions between the Dean, Associate Dean Undergrad and the various academic units on how to best involve lecturers within the Math Faculty. This discussion has been going for more than a year now. It is hoped that a resolution will be found within the next year. This, though, is ultimately the responsibility of the Dean, and not within the control of any of the units under review.

7. Some concrete decision needs to be taken on the Computational Math program. Specifically, either promote it, or close it down. There seems to be a great opportunity for an exciting math program that could lead to outstanding careers for students. This would be in computational math, modeling, data analytics, and related industrial careers that merge math skills with cutting edge computation. Yet we see little enthusiasm by current participants and little effort to advertise and promote the program. Without an effort by the Faculty of Mathematics to properly grow this endeavour, perhaps resources should be re-allocated elsewhere. We recognize that the program is probably not expensive to run and that the graduate portion of the program may be valuable --- it should at the very least be easy for current students to know about this program. For example, it is listed under “programs” on the “future undergraduates” page of the Faculty of Mathematics but is not listed under “majors, minors, and specializations” on the “current undergraduates” page.

Response
The Computational Mathematics undergraduate program has been growing substantially over the past few years. The number of students enrolled has increased approximately 40% per year since 2015. The topic was discussed between the Director of Computational Mathematics and the Dean, and it was mutually agreed that the undergraduate program fulfills an important role in the Faculty.

The Computational Mathematics program has already undertaken some initiatives to promote its undergraduate program. In early November 2016, Computational Mathematics held a career panel consisting of past graduates of the Computational Mathematics program. These alumni talked about what they got out of the program, as well as where they are now in their career. The panel was very well attended by undergraduates (about 80 students) and will help promote the undergraduate program. Given its success, the Centre plans to hold more events like this one.

The Computational Mathematics Steering committee will continue to discuss other ways to promote the undergraduate program.
8. In our discussions with the research faculty, there was great concern about the New Resource Allocation Model (NRAM) that is being implemented. For example, the Applied Mathematics department is in a precarious position vis a vis engineering. Engineering programs at other universities have created their own courses, with their own course codes, in which they present mathematical material. They then changed their program requirements so that they no longer require a particular course that is taught by the mathematicians and, instead, required their own course. It is our understanding that the Applied Math department has made great efforts to staff first year math courses for engineering students and so they are, naturally concerned, about whether the NRAM will encourage engineering departments to try and play the types of games that have been played at other universities. And, of course, because of the three-department structure any such behaviours would disproportionately affect the Applied Math department which has been acting for the common good by sending its faculty members to teach courses that are focussed on students from an outside faculty.

Response
There was no actual recommendation here, so no response is needed.

9. As a final note, the innovation goals of the university need to be better addressed in the programs. While the co-op programs, and online course development are a notable and worthy contribution to innovation, it would be outstanding to see the introduction of professional skills training for the students. This could include courses that work on presentation skills, project management, team management, use of technology in mathematical work, a math modelling course in AMATH for use in industry, and so on. Experiments in novel teaching methods, experiential learning, and entrepreneurial activities should be actively promoted by the Faculty for delivery in its programs.

Response
The co-op program includes substantial professional skills training for students, and our departments’ courses already include presentations, project and team management, technology, and mathematical modelling. All units under review are constantly examining their teaching methods, and we will continue to teach our students in the best way possible, using both novel and tried-and-true techniques.
### Implementation Plan:

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Proposed Follow-up</th>
<th>Responsibility for Leading and Resourcing (if applicable) Follow-up</th>
<th>Timeline for addressing Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Improve information and advice provided to potential and current undergraduate students, whether that be through online resources and webpages or in-person advising.</td>
<td>Revamp of the Math Websites to improve communication with current and potential students</td>
<td>Jodi Szimanski (Director of Communications and Research Alliances)</td>
<td>December 2018</td>
</tr>
<tr>
<td>2. Reconsider the program entrance requirements; put less emphasis on contest exam scores.</td>
<td>More focus on the “Additional Information Form” so that the faculty is considering more than just marks.</td>
<td>Serge D'Alessio (Associate Dean – Admissions &amp; Outreach)</td>
<td>Completed</td>
</tr>
<tr>
<td>3. Implement a process to continuously update and keep current the courses and curricula in the programs.</td>
<td>To be studied by the respective curriculum committees.</td>
<td>Undergraduate Associate Chairs (for departments), Director (Centre of CM)</td>
<td>Ongoing</td>
</tr>
<tr>
<td>4. Implement a process to identify and cover any gaps in the curriculum.</td>
<td>To be studied by the respective curriculum committees.</td>
<td>Undergraduate Associate Chairs (for departments), Director (Centre of CM)</td>
<td>Ongoing</td>
</tr>
<tr>
<td>5. The University needs to consider the issue of renewal of faculty in Pure Mathematics and Combinatorics and Optimization.</td>
<td>Both departments, as well as Applied Math, hired in 2017</td>
<td>Stephen Watt (Dean of Math)</td>
<td>Completed</td>
</tr>
<tr>
<td>6. Fully integrate lecturers into the department including affiliating a lecturer to a particular department.</td>
<td>Ongoing discussions between unit heads and Dean of Math</td>
<td>Francis Poulin (Associate Dean - Undergrad)</td>
<td>December 2018</td>
</tr>
<tr>
<td></td>
<td>Make a concrete decision regarding the Computational Math program; either discontinue the program or put more effort into promoting it</td>
<td>Ongoing discussions between Director of CM and dean</td>
<td>Jeff Orchard (Director of CM) and Stephen Watt (Dean of Math)</td>
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</tr>
<tr>
<td>8.</td>
<td>Reviewers’ recommendation is actually a comment on NRAM with no suggestion for follow-up</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>9.</td>
<td>Innovation goals of the university need to be better addressed by the programs such as through implementation of professional skills training.</td>
<td>Continue to teach students in the best way possible, using both novel and tried-and-true techniques.</td>
<td>Undergraduate Associate Chairs (for departments), Director (Centre of CM)</td>
</tr>
</tbody>
</table>

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

Signatures of Approval:
Kathleen Mac (PM) Feb 23/18, Walid Al-Jasser (AM) March 5/18

Chair/Director

Date

AFIW Administrative Dean/Head (For AFIW programs only)

Date

Faculty Dean

Feb. 22, 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
Two-Year Progress Report
Society, Technology and Values
(Undergraduate Option)
September 2018

Background:
The last program review of the Society, Technology and Values (STV) Option was completed in June 2015. A response to the Reviewers’ Report was submitted to the Associate Vice-President, Academic’s office in April 2016. The Final Assessment Report was approved by Senate Undergraduate Council on September 13, 2016. In this progress report, the Centre for Society, Technology and Values (CSTV) tracks progress in responding to the recommendations of the reviewers.

Progress on Implementation Plan:
The reviewers made five recommendations. Actions of CSTV in response to each recommendation are provided below.

1. It was recommended that CSTV take action to raise the visibility of its course offerings and the Option on campus, and to more clearly define its identity.

Status:
In progress

Details:

CSTV has taken and is planning a number of small but significant changes to improve the likelihood that undergraduates, particularly Engineering students, become aware of and choose the STV Option.

One example of such a change: the STV Option is now much easier to find in the Undergraduate Calendar for students in the Faculty of Engineering (from which most STV students are still drawn). It is listed separately for non-Engineering students.

Having gathered information about first-year Engineering students’ programs and scheduling, the Centre is developing a plan to make first- and second-year Engineering students more familiar with STV courses and the Option as an important first step in making the Option more viable for Engineering students. Our provisional plan is to modify the Option so that only a
minimum of three STV courses are required plus three STV-like courses. With this change, students in most Engineering programs could take the Option without needing extra courses to graduate. In Winter 2019, the CSTV Director will work with the Associate Chairs of interested departments in Engineering to map out paths that students can use to achieve the revised Option.

In September 2018, the Centre moved from a quiet corridor in Engineering 3 (E3) to the heart of Systems Design Engineering (SYDE) in Engineering 5 (E5). In 2019, the Centre will make our presence better known to students, staff, and faculty that use E5 and E7 (especially the 6th-floor bridge between the two buildings), with posters, displays from the Computer Museum, and prominent signage. Existing Centre personnel will be able, with a small budget for posters and using available artifacts, to highlight STV courses and Option requirements and to illustrate in small exhibits certain technical aspects of courses such as STV 202: Design and Society and STV 210: The Computing Society.

In Winter 2019, the Centre plans to have guest speakers in two classes that will be open to the public. STV 305: Technology, Society, and the Modern City will feature a discussion on the use of electric scooters in urban areas, with a focus on the pilot study in Waterloo this autumn. STV 302: Information Technology and Society will present Dr. Branka Marijan from the peace research organization Project Ploughshares, who will speak about autonomous weapons. The Centre also intends to work with Dr. Marijan over the next few months to develop a talk on digital literacy, to be presented both on campus and off.

Offering courses online appeals to part-time and mature students, to co-op students on work term, and to full-time students who cannot fit courses into their regular schedules. Online courses are also advertised separately. So, the Centre and Option benefit from more exposure when some offerings are available online. STV 202 will be the first online STV course. It has an appeal beyond Engineering and the on-campus course regularly has more applicants than available seats. The long-time course instructor has recently published a textbook that is being used in the on-campus version of the course and will provide a framework for the online offering.

The Centre is gaining profile across campus as the co-host of the University of Waterloo Computer Museum, which was co-created by the Director of CSTV, Dr. Scott Campbell. Three temporary displays related to events in the Faculty of Mathematics in March, June, and September 2017 were seen by hundreds of alumni, faculty, and students. Three permanent displays are planned for the Faculty of Mathematics, including one on slide rules that will be up early in 2019. Future displays in the Department of Systems Design Engineering and Engineering Computing are in the planning stages. The Museum has considerable research and teaching value and artifacts have been employed in STV courses.
The CSTV reviewers saw value in promoting CSTV as a research centre, which is in the original mandate. The Museum offers real opportunities in this regard, hosting research projects that explore the historical relationship between computers and society. The current emphasis on artificial intelligence and autonomous technology is also ideally suited to exploration from a STV perspective. The Centre is seeking SSHRC funding in partnership with Project Ploughshares on research that will strengthen the dialogue among academic researchers, industry, civil society, and nongovernmental organizations on the impacts of these technologies on governance, democratic participation, and conflict and security.

In 2018, Dr. Campbell’s presentation at the CTE Teaching and Learning Conference raised the profile of both the Centre’s course offerings and the Museum. At the 2019 Conference, he will offer a presentation on how to teach a class with students from a variety of disciplines.

The CSTV Twitter account is active and has 50 followers, including academics and journalists. The Centre’s website has been updated and is the site of a blog that has had more than 140 postings in less than two years. The Director of CSTV was interviewed in Fall 2017 by a journalist writing for The Globe and Mail about ethics and autonomous vehicles.

In early 2019, the Centre will begin working with the Engineering Change Lab (ECL) of Engineers Without Borders, to help develop greater links among Engineering faculty members interested in STV-like teaching and research. The ECL exists to facilitate high-level connections between academic, government, industry, and nonprofit organizations interested in taking up the challenges of engineering education and training in Canada.

2. **CSTV was advised to improve and formalize ties with other groups, particularly in the Faculty of Arts.**

**Status:**
In progress

**Details:**
The Centre has actively participated in the Science and Technology Studies (STS) Teaching Group initiative originally headed by Heather Douglas (Waterloo Chair in Science and Society, in Philosophy), which aimed to create a cross-faculty, interdisciplinary STS minor available to all undergraduates. As a leading member of this coalition of instructors from across campus, CSTV Director Campbell was involved in preliminary discussions with the Provost in the summer of 2017. Although Dr. Douglas has now left the university, the STSTG continues to meet and has plans to stage pedagogical events in 2019.

STV courses have established informal but longstanding connections across campus. For example, every term STV 202: Design and Society has guest speakers from Engineers without...
Borders and St. Paul’s University College’s GreenHouse for social impact incubation. In such interactions, all groups become more aware of the others. CSTV is also developing more links with Project Ploughshares and the Centre for Peace Advancement at Conrad Grebel University College, including co-sponsored events.

When envisioning closer ties with the Faculty of Arts that would benefit CSTV, it seems natural to turn to other interdisciplinary programs. In rebuilding the STV Option, we will add the new course PACS 315: Engineering and Peace, to our own short list of elective courses. There is also the possibility that this course will be cross-listed with STV. We currently cross-list one other course, STV 210/HIST 212; however, in three iterations almost all students have been from Engineering, with only a few from Arts and Mathematics. Before encouraging more cross-listing, the Centre must find ways to encourage non-Engineering students to enroll.

Currents efforts of the Centre focus on the Faculty of Engineering, where there have been signs of renewed interest in the STV Option. However, the Centre remains open to undergraduate-based links with other Faculties, particularly those that encourage programs to add STV courses to elective lists, and from which we can draw courses as we improve the Option and create our own elective list of STV-like courses.

For example, the School of Planning recently indicated an interest in cross-listing STV 305: Technology, Society and the Modern City, and that same STV course will be added to an elective list in the new Minor in Urban Studies in the Faculty of Environment. Further discussion may reveal potential for stronger links with that Faculty. STV courses are also on a short list of electives for some Applied Health programs and further discussion could reveal deeper potential with Applied Health Studies.

3. CSTV was advised to expand its intellectual scope, possibly through new course offerings, the addition of faculty, and curricular reform.

Status:
In progress

Details:
The Centre now has two full-time permanent faculty members. It has always existed on a restricted budget; even maintaining the status quo took careful planning. However, early indications suggest that the new activity-based budget model will give the Centre a chance to grow. This could lead to a third full-time faculty member, offering considerable scope for expanded intellectual scope and new courses. We look forward to this possibility.

Over the last year, Systems Design Engineering has been developing an Artificial Intelligence (AI) graduate program, which also presents the possibility of gaining a part-time faculty
member responsible for a graduate course on the impact of AI and a related undergraduate course.

A new senior course, **STV 305**: Technology, Society and the Modern City, is now in the undergraduate calendar and will be taught regularly, starting in Winter 2019.

However, before more courses are developed, it is important to rationalize existing courses and revamp the Option, so that it is easily seen how each new offering helps students to fulfill requirements that make the Option worthwhile to them and to future employers.

Renumbering of courses has taken place and is reflected in the 2018-2019 Undergraduate Calendar. **STV 100** remains the introductory course, although there is some thought that it could be bumped to a 200-level course with a greater emphasis on theory, while a more general introductory course on the value of understanding the relationship between society and technology for all citizens would be developed. In a way, it would correspond to **PACS 101**: Peace is Everybody’s Business. Such a course could attract a new student clientele.

All the **200-level courses** now have an enrolment cap of 80 and none have prerequisites. They include STV 201: Special Topics, 202: Design and Society, 205: Cybernetics and Society, and 210: The Computing Society (cross-listed as HIST 212).

All **300-level courses** have an enrolment cap of 25 and have prerequisites; they are designed for more experienced students. They include STV 302: Information Technology and Society, 304: Technology in Canadian Society, 305: Technology, Society, and the Modern City, and 306: Biotechnology and Society.

**STV 400**, a supervised independent research project course, is still for Option students only and is required to complete the Option. STV 401 is available for advanced topics.

In the upcoming revamping of the Option, STV 400 will become only one possible route to completing the Option. The requirement of a lengthy research project is a known deterrent to prospective students, many of whom have other significant project-based courses in their final year. An STV Option that can be achieved through coursework only will be introduced. It will consider STV-like courses already offered by various departments. Here is a small, partial list of courses from across campus that fit this criterion:

- **BET 420**: Entrepreneurship for Social Impact
- **ENGL 108D**: Digital Lives
- **ERS 372**: First Nations and the Environment
- **GER 271**: German Thought and Culture: Objects
- **MSCI 442**: Impact of Information Systems on Organizations and Society
- **PHIL 252**: Quantum Mechanics for Everyone
• **SVENT 225P**: Social Entrepreneurship: Exploring Social Change
• **WS 205**: Gender, Culture and Technology.

The likely format of the new Option will be 3 STV courses + 3 STV-like courses (which could include more STV courses).

To improve course offerings and overall pedagogy, CSTV instructors will continue to explore opportunities through on-campus teaching events, such as the [Teaching Excellence Academy](#) or the [Instructional Skills workshops](#), and the annual [Teaching and Learning Conference](#). Off-campus teaching conferences may be explored as well. CSTV occupies a rare interdisciplinary nexus for undergrads at UW, which generates unique and valuable pedagogical perspectives worth sharing.

The Centre has no graduate students, so there is no obvious source of teaching assistants or sessional instructors. Until a new full- or part-time instructor becomes available, CSTV will endeavor to locate senior graduate students and sessional instructors already on campus who can take over one of the established STV courses—in particular, STV 100 and 202—so that experienced instructors can develop new courses, both a new introductory course with broad appeal, and more senior courses that can help our future professionals.

4. **The Centre was strongly encouraged to develop a long-term plan—a set of clear goals—that will provide a context for all activities and reforms.**

**Status:**
In progress

**Details:**
The Centre has been a leading member of the STS initiative. Long-term planning for the Centre was linked to that effort and major changes to the STV Option were held off to ensure that it would mesh with a possible STS Minor. It is no longer clear when that Minor will develop. Although some momentum has been lost, STV instructors remain interested in reaching students from all Faculties.

At present, we believe growth for the Centre is best found by assisting departments in the Faculty of Engineering in both meeting and exceeding the accreditation requirements of Engineering students, especially in the areas of the impact of technology on society, ethics, and the development of professionalism. Over the next year, the Director of CSTV will work with the individual Engineering departments to modify the scheduling and requirements of the Option to more easily meet the specific career aspirations of particular blocks of Engineering students.
The STV name was considered a weakness in 2016. What did “values” mean? In 2018, with a newly focused emphasis at the University of Waterloo on meeting the needs of the whole student, a set of courses that focus on values and what the society and the individual mean by values seems to have something important to contribute.

As well, ideas of values have relevance in the professionalization of Engineering students. For example, the Canadian Engineering Accreditation Board graduate attributes relate professionalism and engineering impact to public interest, equity, sustainability, and stewardship. The University of Waterloo Undergraduate Degree Level Expectations emphasize autonomy, professional capacity, and diversity. At the University of Waterloo, the relationship of these values with the development and use of technology ought to be deliberately explored in an academic setting.

5. CSTV was asked to explore the reasons for low enrolment in the Option.

**Status:**
In progress

**Details:**
Option enrolment is low for several reasons. First, many students from across campus remain unaware of its existence, and we have outlined some plans above to correct that. It is still, however, necessary in an era of increasing specialization to continually make the case for small interdisciplinary programs that reach across faculties. Second, the Option requirement of STV 400 is too burdensome. Removing STV 400 as a requirement (as outlined above in point 3), will help. Third, few students are willing to take extra courses to graduate, but we believe we have identified paths in many Engineering programs that could minimize or eliminate this problem. Working with specific departments should help make the Option more attractive, as will providing at least one STV course online.

The Option category could be a problem as well. “Options” are an idiosyncratic Waterloo degree designation and our research has indicated that the number of available Options has decreased significantly in recent years. There are no Options in the Faculty of Arts—only Minors, Diplomas, and Certificates. Most Options in other faculties are largely an area of concentration within a particular discipline. So, it is hardly surprising that few students consider adding an Option to their program of study. Currently, we do not believe there is sufficient interest to recommend ‘promoting’ the STV Option to the more recognizable ‘Minor’ designation, nor would it make sense to convert the Option to a Diploma or Certificate.
Engineering is actually relatively generous in providing a variety of Options to its students. Again, they tend to reflect an area of concentration within one discipline, more than a cross-disciplinary focus on a particular topic. The existing STV Option could fill a gap.

**Explain any circumstances that have altered the original implementation plan:**
The new activity-based budget model is being rolled out more slowly than expected and uncertainly still exists about how much money will flow to CSTV. This directly affects the ability of CSTV to make plans, but also results in hesitation across many parts of campus to explore new endeavors. However, as noted above, preliminary information made available in late 2018 suggests that the Centre will have the resources to consider new activities and even a new faculty member.

**Address any significant developments or initiatives that have arisen since the program review process, or that were not contemplated during the review:**
Growing interest at the University in the relationship between AI and ethics/values has led to the formation of a committee by the Office of Research to explore this area in more depth. The Centre is ideally placed to make a significant contribution to these activities, because such a relationship is at the core of all STV teaching. Such a focus suggests an opening to a fuller exploration of the idea of values and what they mean to citizens of a society—not only future employees.
Updated Implementation Plan:

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Proposed Actions</th>
<th>Responsibility for Leading and Resourcing (if applicable) the Actions</th>
<th>Timeline for addressing Recommendations</th>
</tr>
</thead>
</table>
| 1. Improve profile of CSTV, STV courses & STV option | STV Option relocated in Undergrad Calendar (COMPLETE)  
Work ongoing to connect with advisors and students about Option, particularly within Engineering.  
Improved physical and online presence. E.g., small events and signage in new office location.  
Research-based partnerships being explored and developed  
Computer Museum giving Centre new profile | Director, CSTV | Ongoing during next 5 years |
<p>| 2. Increase non-Engineering enrolment | Continued participation with Science and Technology Teaching Group to encourage cross-faculty student enrolment. | Director, CSTV | Ongoing |</p>
<table>
<thead>
<tr>
<th></th>
<th>Restructure Option</th>
<th>Option revamp</th>
<th>CSTV Director</th>
<th>Fall 2019</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>Rebuild STV curriculum</td>
<td>Courses renumbered and in Calendar. New course STV 305 (COMPLETE)</td>
<td>CSTV Director</td>
<td>Complete</td>
</tr>
<tr>
<td>5</td>
<td>Improve student gender balance</td>
<td>Sensitivity to gender and diversity in all courses; more diversity seems to be occurring naturally as more women enter STEM disciplines on campus.</td>
<td>All STV instructors</td>
<td>Ongoing</td>
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<tr>
<td>6</td>
<td>Improve CSTV governance and administrative limitations</td>
<td>Action still needs to be taken</td>
<td>CSTV Director</td>
<td>2020</td>
</tr>
<tr>
<td>7</td>
<td>Improve profile</td>
<td>See recommendation 1, above.</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>Improve ties with other groups</td>
<td>Links are being maintained with STSTG and strengthened with PACS, the Centre for Peace Advancement, and Project Ploughshares. Exploration of closer ties with Departments across campus that offer STV-like courses is ongoing.</td>
<td>CSTV</td>
<td>Ongoing</td>
</tr>
<tr>
<td>9</td>
<td>Expand scope, critical perspectives</td>
<td>New course (STV 305, COMPLETE), new online section of existing course (starting with STV 202)</td>
<td>STV 202 instructor will develop online version; resource requirement TBD.</td>
<td>Online course planning in progress; complete by 2020/2021.</td>
</tr>
<tr>
<td>10</td>
<td>New long-range vision</td>
<td>Develop option possibilities that appeal to Engineering students</td>
<td>CSTV Director exploring SSHRC Partnership grant possibilities</td>
<td>Grant applications starting in 2019</td>
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<tr>
<td>11. Improve Option enrolment</td>
<td>By focusing on key groups of students, Option can be redesigned to meet particular needs.</td>
<td>CSTV Director</td>
<td>Option revisions submitted by Fall 2019</td>
<td></td>
</tr>
</tbody>
</table>

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
Date of next program review: 2022-2023

Signatures of Approval:

Chair/Director

Date

Faculty or Administrative Dean

Date

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

Date

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

Date

September 2018
FOR INFORMATION

Recognition and Commendation

Ten Waterloo researchers are receiving seed funding from the Centre for Bioengineering and Biotechnology (CBB). The funding will support the collaboration of multi-disciplinary research teams across Waterloo faculties and departments, with the goal of propelling scientific innovation and growth, and mentoring the next generation of researchers.

The recipients of round two are:

- **Peter Levine**, Electrical and Computer Engineering; **Robin Duncan**, Kinesiology - “A semiconductor-integrated electrochemical camera for real-time label-free cell assays”
- **Parsin Haji Reza**, Systems Design Engineering; **Vivian Choh**, Optometry - “Retinal oxygen metabolic rate extraction using a novel imaging method”
- **Todd Holyoak**, Biology; **Scott Taylor**, Chemistry - “Structural studies of bacterial IgA1 proteases”
- **Evelyn Yim**, Chemical Engineering; **David Spafford**, Biology; Duke-NUS Medical School, Singapore - “Matrix mechanobiology in enhancing neuronal differentiation and maturation of Rett Syndrome patient derived stem cells”

(adapted from the Daily Bulletin 15 March 2019)

Each month, the Office of the President recognizes students, faculty, staff and alumni who go above and beyond. The President’s Accolades celebrate stories of dedication, passion and contribution from our University community.

Congratulations to the University of Waterloo community members currently being recognized from February:

- A team of School of Accounting and Finance students won the national EY Challenge in Toronto, besting all other teams from Canadian universities
- Three Waterloo graduate student researchers were named to the top entries of NSERC’s Science, Action! Video contest
- A Waterloo eSports team placed 3rd out of 445 colleges and universities across North America in the Tespa Overwatch Collegiate Championships
- Arts alumnus Jessica Kuepfer has re-signed with Team New Balance to represent the athletic brand as a competitive tri-athlete.

(adapted from the Daily Bulletin, 20 March 2019)
Every year one co-op student from each faculty is recognized by the University of Waterloo for their contribution to their employer, community and the further development of experiential education. This year’s winners are:

- **Lauren McLennan – Public Health (Faculty of Applied Health Sciences)**
  Lauren McLennan travelled to Uganda where she was an international consultant and project manager for FullSoul Canada.

- **Krista Duncan – Speech Communications (Faculty of Arts)**
  Krista Duncan served as a people operations intern at Wealthsimple, where she assisted with employee development plans and compensation strategies.

- **Nathan Duarte – Biomedical Engineering (Faculty of Engineering)**
  Nathan Duarte helped develop a novel bioink that can be used to decrease the amount of time it takes to 3D print kidney tissues while he was a visiting undergraduate student at Harvard University’s Wyss Institute for Biologically Inspired Engineering.

- **James Schnarr – Environment and Business (Faculty of Environment)**
  James Schnarr created a digital content series for Xbox’s Canada Day Promotion while working as an Xbox marketing associate at Microsoft Corporation.

- **Yutong Wu – Computer Science (Faculty of Mathematics)**
  While working as an engineering intern for Aetion, Yutong Wu created an algorithm to capture drug usage and switching patterns, allowing scientists to distinguish the effects of different drugs. generate histogram bins and label sizes.

- **Stephanie Chan – Biochemistry (Faculty of Science)**
  Stephanie Chan worked in several clinics during her co-op terms at Sunnybrook Health Sciences Centre, including the palliative care radiation clinic, breast cancer radiation clinic and the bone metastases clinic.

In addition to the students listed above, Yasmeen Razvi (Applied Health Sciences), Carly Stanisic (Arts), Emily Lam (Engineering), Hannah Dubber (Environment), Yan Zhang (Mathematics) and Emily Pass (Science) received honourable mentions for Waterloo’s awards.

(adapted from Waterloo Stories, 22 March 2019)

Startups in the fields of medical imaging, advanced manufacturing, construction, and travel were among the winners of the Velocity Fund Finals, which took place today at the Tannery Event Centre in downtown Kitchener. The following startups won an investment and will continue to work at or be admitted to the Velocity Garage startup incubator:

- **ClearVoxel Imaging**, a medical company that aims to help radiologists diagnose patients more quickly and accurately, was among the recipients of the grand prize. Their prototype, which uses eye-tracking and analytics, has been tested with 40 different radiologists. They have two hospitals currently signed up for pilot studies.

- **SiteVue** is a software platform that allows construction managers to monitor their projects in real time. Most recently completed a case study with AECOM on the Highway 427 expansion construction project.

- **Glove Systems** cloud-based end-to-end solution for the fabrication industry and construction industry to reduce scheduling and cost risks.

- **Tugolo** generates authentic, unique and cultural travel experiences created and run by local providers. To date, the startup has helped 650 travelers book trips.

(adapted from the Daily Bulletin, 29 March 2019)
The Department of Athletics and Recreation celebrated the 2018-19 Warriors season on Friday night at the 59th annual Athletics Awards Banquet. Top honours on the evening went to fifth year women’s volleyball star Claire Mackenzie and second year quarterback from football, Tre Ford.
(adapted from the Daily Bulletin, 2 April 2019)
The Academic Colleagues met separate from and jointly with the Academic Heads during the Council Meeting on April 4, 2019, at Queen’s University.

During a separate meeting with the Academic Colleagues, Dr. Jill Scott, Vice-Provost, Teaching and Learning at Queen’s University, and Dr. Brian Frank, Associate Dean, Teaching and Learning, Faculty of Engineering at Queen’s University provided an engaging presentation (“Student Skills & Learning Outcomes: Rethinking Tools & Assessments”) regarding different approaches to measuring learning outcomes. The broader context in which this presentation falls is the following. Measuring and reporting learning outcomes may be something the government is interested in, and there may be opportunities to develop new metrics related to learning outcomes in future accountability frameworks. The exact approach the current government will take with respect to metrics associated with university funding in the context of SMA3 and the differentiation envelope is not yet clear. Notwithstanding, a number of pilot projects undertaken by universities to examine potential metrics (final report on these pilot projects was provided to Provosts in Fall 2018), may help frame this discussion.

Queen’s has been engaged in a study of learning outcomes over the past several years (most recently also in collaboration with Ryerson). Using both standardized tests (CAT, CLA+, etc.) and VALUE (Valid Assessment of Learning in Undergraduate Education; Association of American Colleges & Universities) to assess “critical thinking” and “communication” skills, Drs. Scott and Frank showed that there is measurable improvement between first and fourth year for students in all faculties. Subsequent discussion with the Academic Colleagues focused on challenges and opportunities related to making learning outcome assessment sustainable, scalable and collaborative across and within Universities. Faculty engagement was considered essential to the success of any institutional strategy. A presentation incorporating the input from Academic Colleagues was then made to the Executive Heads by Drs. Scott and Frank during the joint lunch meeting.

Colleagues also discussed the following regarding the tuition cut:

- Tuition set aside: it was confirmed that there are no planned changes to the TSA program.
- Implementation for the tuition cut is expected for all programs starting in 2019-20 academic year (this is May for some institutions).
- Academic Colleagues talked about opportunities to challenge government on this cut, which is a significant reduction in revenue for the sector. COU continues to make arguments to government about efficiencies in the sector, which have resulted from many years of underfunding. Another approach is to let 3rd party advocates make arguments on behalf of universities. For example, OUSA or OCUFA. Another approach is to consider what policy levers may be helpful to universities in this context. For example, policies related to faculty renewal may be helpful to universities.
- It was reported that the tuition cut represents on average about a 3% revenue decrease. The size of the cut ranges, however, from 1.5% - 5% depending on the size of the institution.

Colleagues discussed the following regarding ancillary fees:
• The government is developing a framework to outline essential versus non-essential fees. It is now understood that athletics and recreation related fees are considered essential. The essential/non-essential seems straightforward, but will be very complex to implement.
• Universities are required to develop an online system for choosing non-essential fee participation; the online system is required to be in place for September 2019.
• It is clear that this new system will be very costly to universities with respect to implementation. COU has made the case that the resources required (technology and people) are significant.
• There are psychological differences between opting in and opting out. Most universities will likely use an opt out process.
• COU has talked to ministry colleagues regarding the problem of students who have opted out of a non-essential fee but want to use the services anyway. It is not clear how this can be addressed.

Last but not least, Colleagues talked about changes to OSAP:
• There have been many dramatic changes to OSAP over the past few years.
• The recent announced changes revert some OSAP coverage to what was provided 2 years ago; some changes go even further with respect to cuts.
• All non needs-based aid has been cut.
• Government is no longer talking about “free tuition.”
• All students will receive at least 10% in loans as part of an OSAP package.
• There are different eligibility thresholds for first and second entry programs.
• Other changes include: personal contribution requirements, parental or spousal contribution amounts, the definition of “dependent,” debt load allowances, the grace period for interest has been eliminated.
• COU has asked government for information regarding how much will be saved with these changes. It is not yet clear what the savings will be.

The next meeting of the Academic Colleagues will take place in May, 2019, in Toronto.

Marios Ioannidis
Academic Colleague to COU
REPORT OF THE DEAN OF APPLIED HEALTH SCIENCES TO SENATE

April 15, 2019

FOR INFORMATION

A. APPOINTMENTS

Probationary-term reappointments

BUTT, Zahid, Assistant Professor, School of Public Health and Health Systems, July 1, 2019 – June 30, 2022. Postdoctoral teaching fellow, School of Population and Public Health; 2018; Postdoctoral research fellow, School of Population and Public Health; 2015-2019; Ph.D. (Epidemiology) Michigan State University (2011); MSc, University of Karachi, Pakistan (2002); MBBS (MD), Dhaka University, Bangladesh (1991-1998). Dr. Butt’s research focusses on epidemiology, biostatistics, and specifically infectious diseases, mental health, behavioural disorders and substance use. His expertise in working with large datasets will be a good fit with the School.

Adjunct Appointments

Graduate Supervision

ARAI, Susan, Associate Professor, Department of Recreation and Leisure Studies, July 1, 2018 – December 31, 2019.

Special Appointments

Graduate Instruction

KACZYNSKI, Andrew, Lecturer, School of Public Health and Health Systems, May 1, 2019 – August 31, 2019.

Cross Appointment

DRIEZEN, Peter, Research Assistant Professor, Department of Psychology to School of Public Health and Health Systems, February 1, 2019 – April 30, 2023.

B. ADMINISTRATIVE APPOINTMENTS

LAING, Andrew, Acting Associate Chair, Graduate Studies, Department of Kinesiology, July 1, 2019 – December 31, 2019.

MOURTZAKIS, Marina, Associate Chair, Applied Research, Partnerships and Outreach, Department of Kinesiology, July 1, 2019 – May 31, 2022.

VIGNA, Chris, Associate Chair, Undergraduate Studies, Department of Kinesiology, May 1, 2019 – April 30, 2022.

C. SABBATICAL LEAVES

Already approved by the Board of Governors

HORTON, Susan, Professor, School of Public Health and Health Systems, September 1, 2019 – August 31, 2020, one year at 94.7% salary.

McILROY, William, Professor, Department of Kinesiology, September 1, 2020 – February 28, 2021, six months at 100%, March 1, 2021 – December 31, 2021, 10 months at 100%.
MIDDLETON, Laura, Assistant Professor, Department of Kinesiology, September 1, 2019 –
August 31, 2020, one year at 100% salary.

D. ADMINISTRATIVE LEAVE
McILROY, William, Professor, Department of Kinesiology, January 1, 2022 – April 30, 2022 at
100%.

Paul Stolee, Interim Dean
Faculty of Applied Health Sciences
A. APPOINTMENTS

Probationary Term Appointments

CATTAPAN, Alana, (BSocSc 2006 University of Ottawa, MA 2007 University of Toronto, PhD 2015 York University), Assistant Professor, Department of Political Science, July 1, 2019 to June 30, 2022. Dr. Cattapan's research examines the social construction of gender and stakeholder engagement in politics and policy making in Canada. She is currently investigating the sociopolitical impacts of the concept of “women of childbearing age” as a demographic category in public health policy and in biomedical research, with a focus on the governance of assisted reproductive technology in Canada, such as conceiving and surrogacy. She will contribute to Department of Political Science strengths in Canadian Politics and Public Policy and Administration, and will be nominated as a Tier II CRC in Gender and Politics. Before accepting the position at the University of Waterloo, Dr. Cattapan was an Assistant Professor at the Johnson Shoyama Graduate School of Public Policy at the University of Calgary.

CRAM, Alec (BA 2002 Queen’s University, PhD 2013, MA 2009), Assistant Professor, School of Accounting and Finance, July 1, 2019 to June 30, 2022. Dr. Alec Cram joins us from Bentley University where he served as Assistant professor in the Department of Information and Process Management for the last 6 years. Dr. Cram is a graduate of Queen’s University where he completed his undergraduate and graduate work. Prior to his graduate studies, he was employed at Deloitte in Toronto in various functions centered on the use of technology and information systems in business. His research work has been published in some of the top journals in the field of information systems with a clear focus on Information Systems development and managing change. Alec’s will be central to the development of the School of Accounting and Finance Initiatives in Technology, Analytics and FinTech for business professionals.

MACDONALD, Logan (BFA 2004 Concordia University, MFA 2011 York University), Assistant Professor, Department of Fine Arts. June 1, 2019 to June 30, 2022. MacDonald is an Indigenous artist of Mi’kmaq heritage who maintains a non-commercial installation and research-based artistic and curatorial practice. His work seeks to decolonize visual culture, specifically looking at Indigenous authored imagery in order to reconfigure core knowledge of visual comprehension, such as color theory and perspective drawing. MacDonald will be an important addition to the Department of Fine Arts, allowing it to expand its scope and perspective and to integrate Indigenous research creation more fully into its programs.

STACEY, Derek, (BBA 2006 Nipissing University, MA 2007 PhD 2012 Queen’s University), Assistant Professor, Department of Economics, September 1, 2019 to June 30, 2022. Derek brings research and teaching expertise in macroeconomics. In recent research, he has studied the effect of changed regulations on housing and real estate markets. Dr. Stacey has extensive teaching experience in macroeconomics and financial economics, and will fill critical teaching needs in the department at the graduate and undergraduate levels.

Definite Term Appointments

D’AMATO, John (BBA 1981 MBA 1983 PhD 1998 Kent State University), Lecturer, School of Accounting & Finance, January 1 to December 31, 2019. John has worked as an adjunct lecturer in SAF for three years, contributing to curriculum and course development. Prior to teaching in SAF, John was a
Senior Partner (1998-2014) at the Business Planning Group in Guelph, Ontario, which is a private consulting firm specializing in first and second stage private placements, restructurings, IPOs, and financing negotiation. John has also worked with the Bank of Montreal in Corporate and Government Banking. John brings significant teaching and industry expertise in firm financing to the School and is currently teaching Introduction to Global Financial Markets, Risk Management, and Derivative Securities courses.

**Definite Term Reappointments**

ZHANG-KENNEDY, Leah, Lecturer, Stratford School of Interaction Design & Business, August 1, 2019 to July 31, 2021.

**Visiting Appointment**

FENG, Yongmei, Visiting Scholar, Department of Economics, February 1, 2019 to July 31, 2019.

STOKLOSA, Michal, Visiting Scholar, Department of Psychology, May 1, 2019 to July 30, 2019.

**Adjunct Appointments – Instruction**

BOUSFIELD, Jourdan, Lecturer, Stratford School of Interaction Design and Business, January 1, 2019 to April 30, 2019.

BUCHENAUER, Cody, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

COREY, Dylan, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

GAZZOLA, Lynn, Lecturer, Faculty of Arts, Stratford Campus, January 1, 2019 to April 30, 2019.

MCGAIRE, Heather, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

O’NEILL, Terry, Lecturer, Stratford School of Interaction Design and Business, January 1, 2019 to April 30, 2019.

RANA, Saeed, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

SMITH, Greg, Lecturer, Stratford School of Interaction Design and Business, January 1, 2019 to April 30, 2019.

VASTA, Sameer, Lecturer, Department of Political Science, January 1, 2019 to April 30, 2019.

**Adjunct Appointments – Graduate Supervision**

BELL, Katherine, Assistant Professor, Department of English Language and Literature, October 1, 2018 to September 30, 2021.

PARNABY, Patrick, Associate Professor, Department of Sociology and Legal Studies, October 1, 2018 to September 30, 2019.

PERRY, Barbara, Professor, Department of Sociology and Legal Studies, October 1, 2018 to September 30, 2019.

TANNER, Samuel, Associate Professor, Department of Sociology and Legal Studies, October 1, 2018 to September 30, 2019.
Adjunct Reappointments – Instruction
ADAMS, Russell, Assistant Professor, Department of Anthropology, January 1, 2019 to April 30, 2019.

BALAISIS, Nicholas, Lecturer, Department of Communication Arts, January 1, 2019 to April 30, 2019.

BALTRUSAITIS, Jonathan, Lecturer, Stratford School of Interaction Design and Business, January 1, 2019 to April 30, 2019.

BRIGGS, Catherine, Lecturer, Department of History, January 1, 2019 to April 30, 2019.

CARTER, Veronica, Lecturer, Department of Fine Arts, January 1, 2019 to April 30, 2019.

CYR, Dylan, Lecturer, Department of History, January 1, 2019 to April 30, 2019.

DE ROOIJ-MOHLE, Margreet, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

DE ROOVER, Megan, Department of Communication Arts, January 1, 2019 to April 30, 2019.

FATIMA, Nafeez, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

FERNANDEZ, Stephen, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

FOLLETT, Alec, Lecturer, Department of Communication Arts, January 1, 2019 to April 30, 2019.

GERNON, Mark, Lecturer, Department of Psychology, January 1, 2019 to April 30, 2019.

GUZIK, Elysia, Lecturer, Department of Religious Studies, January 1, 2019 to April 30, 2019.

HANCOCK, Michael, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

HOSSEINI, Mohsen, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

HUNTER, Natalie, Lecturer, Department of Fine Arts, January 1, 2019 to April 30, 2019.

HUTTER, Daniel, Lecturer, Department of Classical Studies, January 1, 2019 to April 30, 2019.

JANG, Lauri, Lecturer, Faculty of Arts, January 1, 2019 to April 30, 2019.

KARIMZADA, Muhebullah, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

KHALDI, Amir-Shahram, Lecturer, Department of History, January 1, 2019 to April 30, 2019.

KROEKER, Ron, Lecturer, Department of Classical Studies, January 1, 2019 to April 30, 2019.

KUMASE, Workia-azi, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.
LESIUK, Michael, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

LIAQAT, Zara, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

LIN, David, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

LONEY, Grace, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

LOPES, Maria, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

MACINNES, Matthew, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

MAES, Ron, Lecturer, Department of Classical Studies, January 1, 2019 to April 30, 2019.

MALLOY, Adam, Lecturer, Department of Political Science, January 1, 2019 to April 30, 2019.

MCCAULEY, Eva, Lecturer, Department of Fine Arts, January 1, 2019 to April 30, 2019.

MCGOWAN, Rosemary, Lecturer, Department of Political Science, January 1, 2019 to April 30, 2019.

MILETIC, Philip, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

MOTA, Fatima, Lecturer, Department of Spanish and Latin American Studies, January 1, 2019 to April 30, 2019.

NABERT-CHUBB, Rebecca, Lecturer, Political Science, January 1, 2019 to April 30, 2019.

NEUPANE, Dhruba, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

OZKARDAS, Ahmet, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

PECKHAM, Will, Lecturer, Department of Psychology, January 1, 2019 to April 30, 2019.

RAHMAN, Fiona, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

RAJSIC, Predrag, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

RUFFUDEEN, Zamal, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

SABZIAN, Saeed, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

SHAKESPEARE, Robert, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.
SHOEemaker, Corrie, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

SIDER, Kimber, Lecturer, Department of Communication Arts, January 1, 2019 to April 30, 2019.

SlethAUG, Gordon, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

STACEY, Jeffery, Lecturer, Department of Communication Arts, January 1, 2019 to April 30, 2019.

Tanguay, Greg, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

Thompson, Jeffrey, Lecturer, Stratford School of Interaction Design and Business, January 1, 2019 to April 30, 2019.

WANG, Sining, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

Woodford, Benjamin, Lecturer, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

Yazdani, Amin, Lecturer, Department of Psychology, January 1, 2019 to April 30, 2019.

Zmetana, Katherine, Lecturer, Department of Communication Arts, January 1, 2019 to April 30, 2019.

Adjunct Reappointments – Miscellaneous (research, consultations, etc.)
BESNER, Derek, Professor, (Professor Emeritus), Department of Psychology, July 1, 2018 to March 31, 2024.

Research Faculty
Lochner, Martin, Research Associate, Department of Psychology, January 1, 2019 to December 31, 2021.

Graduate Students Appointed as Part-Time Lecturers
AbdelShafy, Nourane, Department of French Studies, January 1, 2019 to April 30, 2019.

Batiot, Maxime, Department of French Studies, January 1, 2019 to April 30, 2019.

Beriault, Phillippe, Department of Philosophy, January 1, 2019 to April 30, 2019.

BreY, Elizabeth, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

CheniER, Allison, Department of Sociology and Legal Studies, January 1, 2019 to April 30, 2019.

Cook, Katie, Department of Sociology and Legal Studies, January 1, 2019 to April 30, 2019.

Corneil, Rebekka, Department of Germanic and Slavic Studies, January 1, 2019 to April 30, 2019.

Dehghani, Morteza, Department of English Language and Literature, January 1, 2019 to April 30, 2019.
DESHANE, Evelyn, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

GALLAGHER, Sara, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

GRUENEWALD, Alex, Department of Philosophy, January 1, 2019 to April 30, 2019.

IRWIN, Ashley, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

KOUTSOGIONNOPOULOS, Alexandra, Department of French Studies, January 1, 2019 to April 30, 2019.

LALONDE, Patrick, Department of Sociology and Legal Studies, January 1, 2019 to April 30, 2019.

LAM, Vanessa, Department of Philosophy, January 1, 2019 to April 30, 2019.

LARCHE, Chanel, Department of Psychology, January 1, 2019 to April 30, 2019.

LITTRELL, Steven Shane, Department of Psychology, January 1, 2019 to April 30, 2019.

MACDONALD, Ian, Department of Philosophy, January 1, 2019 to April 30, 2019.

MARSH, Sara, Department of Germanic and Slavic Studies, January 1, 2019 to April 30, 2019.

MCCHESNEY, Dylon, Department of Philosophy, January 1, 2019 to April 30, 2019.

MORIARTY, Devon, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

MYERS, Ethan, Department of Psychology, January 1, 2019 to April 30, 2019.

NEGAMI, Hanna, Department of Psychology, January 1, 2019 to April 30, 2019.

OFILI, Patricia, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

PESOWSKI, Madison, Department of Psychology, January 1, 2019 to April 30, 2019.

RILEY, Meghan, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

SCOTT, Caitlin, Department of Political Science, January 1, 2019 to April 30, 2019.

SULLIVAN, Alexander, Department of Germanic and Slavic Studies, January 1, 2019 to April 30, 2019.

TIAN, Renfang, Department of Economics, January 1, 2019 to April 30, 2019.

VAN DE KEMP, Jessica-Leigh, Department of English Language and Literature, January 1, 2019 to April 30, 2019.

VERSTRAETE, Hailey, Department of French Studies, January 1, 2019 to April 30, 2019.
WOJCIECHOWSKI, Christine, Department of Sociology and Legal Studies, January 1, 2019 to April 30, 2019.

YESAYA, David, Department of French Studies, January 1, 2019 to April 30, 2019.

Staff Appointments to Faculty
DI GRAVIO, Katrina, Lecturer, Department of Psychology, January 1, 2019 to April 30, 2019.

CAMPBELL, Greg, Lecturer, Department of Communication Arts, January 1, 2019 to April 30, 2019.

NUNEZ, Camelia, Lecturer, Department of Economics, January 1, 2019 to April 30, 2019.

WILLEMSEN, Annaka, Lecturer, Stratford School of Interaction Design and Business, January 1, 2019 to April 30, 2019.

B. ADMINISTRATIVE APPOINTMENTS

BUSCH, Lutz-Alexander, Chair, Department of Economics, July 1, 2019 to June 30, 2023.

DOLMAGE, Jay, Associate Chair, Undergraduate Communications Outcomes Initiative, Department of English Language and Literature, October 23, 2018 to June 30, 2019.

HABIB, Jasmin, Associate Chair, Undergraduate Studies, Department of Political Science, October 1, 2018 to June 30, 2021.

NICHOLAS, Jane, Director, Tri-University Graduate Program in History, Department of History, July 1, 2019 to June 30, 2022.

CHANGE in DATES

BUSCH, Lutz-Alexander, Associate Chair, Undergraduate Studies, Department of Economics, from July 1, 2018 to June 30, 2020 to July 1, 2018 to June 30, 2019.

SMYTH, Heather, Associate Chair, Undergraduate Communications Outcomes Initiative, Department of English Language and Literature, from July 1, 2018 to June 30, 2021 to July 1, 2018 to October 22, 2018.

C. SABBATICAL LEAVES

Approved by the Board of Governors

COLEMAN, Beth, Associate Professor, Department of English Language & Literature, January 1 to June 30, 2019, six months at 85% salary.

Collington, Tara, Professor, Department of French Studies, January 1 to June 30, 2019, six months at full salary.

FONG, Geoffrey, Professor, Department of Psychology, May 1, 2019 to April 30, 2020, twelve months at 100% salary.

HUANG, Alan, Associate Professor, School of Accounting and Finance, July 1, 2019 to June 30, 2020, six months at 85% salary.
McGREGOR, Ian, Professor, Department of Psychology, July 1, 2019 to June 30, 2020, twelve months at 85% salary.

TAYLOR, Sylvia Lynne, Associate Professor, Department of History, July 1, 2019 to December 31, 2019, six months at 85% salary.

WOOD, Joanne, Professor, Department of Psychology, January 1, 2019 to June 30, 2019, six months at 85% salary.

Cancellations
SMYTH, Heather, Associate Professor, Department of English Language & Literature, January 1 to June 30, 2019, cancelled.

Douglas M. Peers
Dean, Faculty of Arts
FOR INFORMATION

A. APPOINTMENTS

New Definite Term - full-time
MAI, Juliane, Research Assistant Professor, Department of Civil & Environmental Engineering, March 1, 2019 - August 31, 2021. PhD, Friedrich-Schiller University, Jena, Germany, 2011; MSc, University of Applied Science HTWK, Leipzig, Germany, 2007; Diploma FH, University of Applied Science HTWK, Leipzig, Germany, 2005. Fields of interest include water resources, hydrologic modelling and sensitivity analysis. Dr. Mai will manage the Canadian Surface Prediction Archive (CaSPAr) online portal of numerical weather predictions.

New Definite Term Reappointment - full-time


Visiting Appointments

REZENDEBARBOSA, TURBIANI, Franciele, Associate Professor, Department of Chemical Engineering, February 13, 2019 – February 12, 2020.

Visiting Reappointments
CHENG, Jinshi, Scholar, Department of Management Sciences, April 1, 2019- May 31, 2019.

Special Appointments
Undergraduate Instruction
TANEHKAR, Ahmad, Lecturer, Department of Management Sciences, May 1, 2019 – August 31, 2019.
Adjunct Appointments
Graduate Supervision and Research
DI CIANO, Massimo, Assistant Professor, Department of Mechanical & Mechatronics Engineering, February 1, 2019 – January 31, 2022.

SHI, Cangli, Assistant Professor, Department of Mechanical & Mechatronics Engineering, March 1, 2019 – February 28, 2022.

Adjunct ReAppointments
Undergraduate Instruction
ZARNETT, Jeffrey, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – April 30, 2020.

Cross Appointments
AZIZ, Hany, Professor, Department of Electrical & Computer Engineering, May 1, 2019 – April 30, 2022.

INGALLS, Brian, Associate Professor, Department of Applied Mathematics to Department of Chemical Engineering, March 1, 2019 – February 28, 2023.

MONTESANO, John, Assistant Professor, Department of Mechanical & Mechatronics Engineering, January 1, 2019 – December 31, 2021.

Cross Reappointments
WILLET, Thomas L., Assistant Professor, Department of Systems Design Engineering to Department of Chemical Engineering, September 1, 2019 – August 31, 2022.

B. APPOINTMENTS
CULHAM, Richard J., Dean’s Advisor, Department of Department of Mechanical & Mechatronics Engineering, January 1, 2019 – April 30, 2019.

C. ADMINISTRATIVE REAPPOINTMENTS
COLLINS, Michael, Associate Chair, Undergraduate Studies, Department of Mechanical & Mechatronics Engineering, May 1, 2019 – April 30, 2022.

IOANNIDIS, Marios, Associate Chair, Undergraduate Studies, Department of Chemical Engineering, May 1, 2019 – April 30, 2020.

MELEK, William, Director of Mechatronics Engineering Program, Department of January 1, 2019 - December 31, 2019.

NIEWA, Patricia, Deputy Chair, Department of Mechanical & Mechatronics Engineering, May 1, 2019 – April 30, 2022.
D. **SABBATICALS**

**CHEN**, Pu, Professor, Department of Chemical Engineering, May 1, 2020 – April 30, 2021, twelve months at 93.3%.

**NARASIMHAN**, Sriram, Professor, Department of Civil & Environmental Engineering, September 1, 2019 to August 31, 2020, twelve months at 85% salary.

**WILLETTE**, Thomas, I., Assistant Professor, Department of Systems Design Engineering, July 1, 2019 – December 31, 2019, six months at 100% salary.

[Signature]

Pearl Sullivan
Dean, Faculty of Engineering
FOR INFORMATION

A. APPOINTMENTS

Probationary Term Reappointments

DOW, Christine, Assistant Professor, Department of Geography and Environmental Management, July 1, 2019 to June 30, 2022: PhD, Swansea University, 2014; MSc, University of Alberta, 2009; MA, University of Edinburgh, 2006.

GEOBEY, Sean, Assistant Professor, School of Environment, Enterprise and Development, July 1, 2019 to June 30, 2022: PhD, Waterloo, 2014; MA, Queen’s University, 2005; BA, Waterloo, 2003.

HALL, Heather, Assistant Professor, School of Environment, Enterprise and Development, July 1, 2019 to June 30, 2022: PhD, Queen’s University, 2012; MA, University of Waterloo, 2007; BA, Laurentian University, 2005.

WORTH, Nancy, Assistant Professor, Department of Geography and Environmental Management, July 1, 2019 to June 30, 2022: PhD, University of Leeds, 2010; MA, Toronto, 2005; BA, Wilfrid Laurier University, 2004.

Adjunct Appointments

Graduate Supervision

VEBLEN, Kari, Professor, Faculty of Environment, January 1, 2019 to December 31, 2022.

Graduate Supervision and Research

FUSCO, Giovanni, Associate Professor, School of Planning, February 1, 2019 to January 31, 2020.

Research

VAN WYCHEN, Westley, Assistant Professor, Department of Geography and Environmental Management, January 1, 2019 to December 31, 2022.

Special Appointments

Instruction

CRAIG, Brian, Lecturer, School of Environment, Resources and Sustainability, May 1, 2019 to August 31, 2019.

CRAY, Heather, Lecturer, School of Environment, Resources and Sustainability, May 1, 2019 to August 31, 2019.

Cross Appointments

HALL, Heather, Assistant Professor, School of Environment, Enterprise and Development to the School of Planning, January 1, 2019 to December 31, 2021.

LARSON, Brendon, Professor, School of Environment, Resources and Sustainability to the School of Planning, January 1, 2019 to December 31, 2022.

B. ADMINISTRATIVE APPOINTMENT

DEADMAN, Peter, Interim Associate Dean, Graduate Studies, Faculty of Environment, January 1, 2020 to December 31, 2020.
ADMINISTRATIVE APPOINTMENT - Revision
SINGH, Simron, Associate Dean, Graduate Studies, Faculty of Environment, July 1, 2016 to December 31, 2019.

ADMINISTRATIVE REAPPOINTMENT
SINGH, Simron, Associate Dean, Graduate Studies, Faculty of Environment, January 1, 2021 to June 30, 2023.

C. SABBATICAL LEAVES
For Approval by the Board of Governors
SEASONS, Mark, Professor, School of Planning, July 1, 2019 to December 31, 2019, at 100% salary.

VINODRAI, Tara, Associate Professor, Department of Geography and Environmental Management/School of Environment, Enterprise and Development, July 1, 2019 to June 30, 2020, at 100% salary.

Jean Andrey
Dean
FOR INFORMATION

A. **APPOINTMENTS** (for approval by the Board of Governors)

**Probationary-Term Appointments**

**JAGANNATH, Aukosh** (BA, 2011; PhD, 2016, both from New York University), Assistant Professor, Department of Statistics and Actuarial Science, July 1, 2019 – June 30, 2022. Aukosh Jagannath holds a PhD in Mathematics from New York State University from 2016. Since then he has been a NSF funded PostDoc at the University of Toronto and he is joining us from a Benjamin Pierce Fellow at Harvard University. His research interests are in probability with applications to statistical physics, combinatorial optimization, mathematics of data science and high dimensional statistics. Aukosh will help develop a stronger theoretical foundation for data science and expand our links with other departments and faculties at Waterloo.

**LIU, Fangda** (BSc, 2009; MPhil, 2011, both from the University of Hong Kong; PhD, 2015, University of Waterloo), Assistant Professor, Department of Statistics and Actuarial Science, June 1, 2019 – June 30, 2022. Fangda Liu holds a PhD in Actuarial Science from the University of Waterloo from 2015. She was then an assistant professor at the Central University of Finance and Economics for 3 years, and joins us from an assistant professor position in the College of Business at Georgia State University. Her research interests include reinsurance/insurance, risk measures, risk sharing and market equilibria. Her work provides a good balance of theory and applications and she will strengthen the actuarial science group within our department.

**WEI, Pengyu** (BEc, BSc, 2013, Peking University; DPhil, 2018, University of Oxford), Assistant Professor, Department of Statistics and Actuarial Science, July 1, 2019 – June 30, 2022. Pengyu Wei holds a PhD in Mathematics from Oxford University from 2018. He is joining us from a senior research associate position at the University of New South Wales Business School. His research interests include quantitative finance, risk management and actuarial science. Given his research expertise at the interface between mathematical finance and actuarial science, Pengyu will create stronger linkages between existing faculty members in these two important areas.

**Probationary-Term Reappointments**


**Definite Term - Appointments**

**SOLEIMANI DAHAJ, Arash** (BSc, 2006, Sharif University of Technology; MBA, 2010, University of Tehran; MSc, 2012, Wilfrid Laurier University; PhD, 2017, University of Waterloo), Lecturer, Office of the Dean, September 1, 2019 – August 31, 2022. Dr. Dahaj will teach six courses per year, participate in course and program development, perform student advising and other duties assigned by the Director of the Mathematics Business and Accounting Programs.

**Definite Term - Appointments**

**AVERY, Jeff**, Lecturer, David R. Cheriton School of Computer Science, July 1, 2019 – August 31, 2022.
Continuing Lecturer – Appointments
DUPONT, Eddie, Lecturer, Office of the Dean, July 1, 2019.

Visiting Appointments

KASTER, Daniel, (University of Londrina), Professor, David R. Cheriton School of Computer Science, March 1, 2019 – March 31, 2020.

Adjunct Appointments
Research
BOONEN, Tim (University of Amsterdam), Associate Professor, Dept. of Statistics and Actuarial Science, March 1, 2019 – February 28, 2022.

Adjunct Reappointments
Instructor
DESCAMPS, Ryan, Lecturer, David R. Cheriton School of Computer Science, May 1, 2019 – August 31, 2019.

ISTEAD, Joe, Lecturer, David R. Cheriton School of Computer Science, May 1, 2019 – August 31, 2019.

Research
ZIMA, Eugene (Wilfrid Laurier University), Associate Professor, David R. Cheriton School of Computer Science, February 1, 2019 – June 30, 2022.

Cross Reappointments

LABAHN, George (Professor, David R. Cheriton School of Computer Science), in the Dept. of Statistics and Actuarial Science, November 1, 2018 – October 31, 2020.

SHAI, Ben-David (Professor, David R. Cheriton School of Computer Science), in the Dept. of Statistics and Actuarial Science, December 1, 2018 – November 30, 2020.

Changes in Appointments
HE, Xi, Assistant Professor, David R. Cheriton School of Computer Science, (ref. Dean’s Report to Senate, September 18, 2018)
From: January 1, 2019 – June 30, 2022
To: March 5, 2019 – June 30, 2022

PEI, Martin, Lecturer, Dept. of Combinatorics and Optimization, (ref. Dean’s Report to Senate, January 2019)
From: December 31, 2018 – August 31, 2019
To: September 1, 2019 – August 31, 2022

Graduate Students appointed as Part-time Lecturers
ESFAHANI, Navid Nasr, David R. Cheriton School of Computer Science, May 1, 2019 – August 31, 2019.
Graduate Students reappointed as Part-time Lecturers
BRADLEY, Kirsten, David R. Cheriton School of Computer Science, May 1, 2019 – August 31, 2019.

Postdoctoral Fellows appointed as Part-time Lecturers

B. SABBATICALS (for approval by the Board of Governors)
BIEDL, Therese, Professor, David R. Cheriton School of Computer Science, May 1, 2019 – October 31, 2019, with 85% salary.

CAMPBELL, Sue Ann, Professor, Dept. of Applied Mathematics, July 1, 2019 – December 31, 2019, with 100% salary.

C. SPECIAL LEAVE
YI, Grace, Professor, Dept. of Statistics and Actuarial Science, July 1, 2019 – June 30, 2020. This is an unpaid leave.

Stephen M. Watt
Dean
For information:

A. **APPOINTMENTS**

   **Adjunct Appointments**

   **Graduate Supervision**

   DANZMANN, Roy, Professor, Department of Biology, February 22, 2019 to February 21, 2022.

   GU, Frank, Professor, School of Optometry and Vision Science, February 1, 2019 to January 31, 2021.

   **Undergraduate Instruction and Research**

   SEYMOUR, Nicole, Clinical Assistant Professor, School of Pharmacy, February 1, 2019 to December 31, 2019.

   **Adjunct Reappointments**

   **Graduate Supervision**

   ARAVENA, Ramon, Professor, Department of Earth and Environmental Sciences, March 1, 2019 to February 28, 2022.

   CHARLET, Laurent, Professor, Department of Earth and Environmental Sciences, April 1, 2019 to March 31, 2022.

   HWANG, Hyoun-Tae, Assistant Professor, Department of Earth and Environmental Sciences, February 1, 2019 to January 31, 2022.

   PARK, Young-Jin, Assistant Professor, Department of Earth and Environmental Sciences, February 1, 2019 to January 31, 2022.

   THULLNER, Martin, Associate Professor, Department of Earth and Environmental Sciences, April 1, 2019 to March 31, 2022.

   **Cross Appointment**

   LAYTON, Anita, Professor, Department of Applied Mathematics, cross appointed to Department of Biology, January 1, 2019 to December 31, 2022.

   McMillan, Colleen, Associate Professor, School of Social Work, cross appointed to School of Pharmacy, January 1, 2019 to December 31, 2021.

   WARD, Valerie, Assistant Professor, Department of Chemical Engineering, cross appointed to Department of Biology, January 1, 2019 to December 31, 2022.
Cross Reappointment

BIZHEVA, Kostadinka, Professor, Department of Physics and Astronomy, cross appointed to School of Optometry and Vision Science, March 25, 2019 to March 24, 2022.

KIM, Na Young, Associate Professor, Department of Electrical and Computer Engineering, cross appointed to Department of Physics and Astronomy, May 1, 2019 to April 30, 2022.

Changes in Appointments

ALSABBAGH, Mhd. Wasem, Assistant Professor, School of Pharmacy, second probationary term extended by one year. New end date June 30, 2022.

CHOI, Kyung-Soo, Assistant Professor, Department of Physics and Astronomy, second probationary term extended by one year. New end date June 30, 2021.

Special Reappointments

Staff Appointed as Part-Time Lecturers

LEKIN, Kristina, Lecturer, Department of Chemistry, May 1, 2019 to August 31, 2019.

FOR APPROVAL BY THE BOARD OF GOVERNORS

C. Sabbatical Leaves

ALSABBAGH, Mhd. Wasem, Assistant Professor, School of Pharmacy, Special Early Leave, September 1, 2019 to February 29, 2020, 100% salary arrangement.

CHEN, Jeff X.Y., Professor, Department of Physics and Astronomy, May 1, 2020 to April 30, 2021, 100% salary arrangement.

FOLDVARI, Marianna, Professor, School of Pharmacy, January 1, 2020 to December 31, 2020, 91.9% salary arrangement.

FORREST, Jamie, Professor, Department of Physics and Astronomy, September 1, 2019 to November 30, 2020, 100% salary arrangement.

GLERUM, Moira, Professor, Department of Biology, Early Leave, July 1, 2019 to December 31, 2019, 85% salary arrangement.

HOPKINS, Scott, Associate Professor, Department of Chemistry, September 1, 2019 to August 31, 2020, 100% salary arrangement.
MARTIN, James, Associate Professor, Department of Physics and Astronomy, May 1, 2019 to April 30, 2020, 85% salary arrangement.

WANG, Xiaosong, Professor, Department of Chemistry, July 1, 2019 to December 31, 2019, 100% salary arrangement.

R.P. Lemieux
Dean
OVERVIEW

1. FAUW 101
2. Some current topics of conversation in FAUW
3. Some tentative data on UW sessional instructors
FAUW 101
Faculty grievances and appeals
TWO DISTINCT PARTS OF FAUW

FAUW BOARD

• 13 elected members
• Meets biweekly

ACADEMIC FREEDOM & TENURE COMMITTEE (AF&T)

• Chair is Lori Curtis, 10+ other senior faculty
• One-on-one advice and assistance to faculty that need help
• Confidential – no flow of info outside of AF&T
TYPICAL FAUW ISSUE FLOWCHART

Member contacts FAUW

Unfair treatment concerns (individual)

AF&T

Do nothing

Informal resolution

Tenure & promotion appeal

Individual/group files a grievance (MoA 9.2)

Other

General concern (Policy X should say Y)

FAUW BOARD

Do nothing

Raise at Faculty Relations Committee (FRC)

Discuss 1-1 with Provost or Dean

Other
INDIVIDUAL GRIEVANCE OR APPEAL PROCESS

This is all handled within AF&T confidentially:

- Identities are accessible ONLY by: AF&T chair, 2 FAUW staff, academic colleague
- Individuals, not FAUW, decide if a grievance is filed
- The FAUW Board receives anonymized aggregate and generalized reporting on grievances and appeals

- FAUW is legally bound by a duty to represent our members and we do this via AF&T support to individuals including:
  - Ensure MoA/Policy is followed
  - Grievance and appeal filing support
  - Provide a faculty colleague to attend meetings

(MoA and Policy: “Members are entitled to be accompanied by a UW colleague …”)
AF&T PROVIDES ALL KINDS OF OTHER CONFIDENTIAL SUPPORT

- [https://uwaterloo.ca/faculty-association/information-faculty/confidential-support-faculty](https://uwaterloo.ca/faculty-association/information-faculty/confidential-support-faculty)
SOME CURRENT TOPICS FOR FAUW

1. Policy drafting
2. Ford government consultations
   ▶ *Postsecondary Education: Sustainability and Renewal. A Discussion Paper* (February 2019)
   ▶ *Ontario Public Sector Compensation Growth Consultations* (Apr-May, 2019)
3. Research professors and sessional instructors

Focus final slides on sessional instructors at UW …
NEW INFO ABOUT SESSIONALS AT UW

UW is relatively unique compared to other institutions

*Source: https://www.policyalternatives.ca/publications/reports/contract-u*
FROM FAUW SENATE TALK LAST YEAR

2014/15

(by course sections taught by appointment type)

Source: 2014/15 is UW-IAP analysis provided to FRC
Part-time UW-based: grad-students, post-docs, research profs, staff, retirees, …

Part-time other: one-course sessional instructors that include industry professionals plus other non-UW affiliated instructors who *may* depend on sessional teaching as a primary source of income
NEW PRELIMINARY SESSIONALS DATA AT UW

Note: 2015-17 data based on reporting from individual Faculties, not perfectly consistent, some work needed before finalizing ...

Part-time UW-based: grad-students, post-docs, research profs, staff, retirees, ...

Part-time other: one-course sessional instructors that include industry professionals plus other non-UW affiliated instructors who may depend on sessional teaching as a primary source of income
**PART-TIME OTHER CONTRACT POSITIONS AT UW**

**Part-time other:** one-course sessional instructors that include industry professionals plus other non-UW affiliated instructors who *may* depend on sessional teaching as a primary source of income

- Sessional instructors in this category (~15% of UW course sections) are not all industry professionals
- Snapshot analysis by FAUW for a single term for units with highest sessional appointment rates shows such sessional instructors of concern are:
  - Teaching 5-10% of course sections in multiple departments
  - Teaching 20-40% of course sections in another group of departments
- Better and continued data would be useful
MOVING FORWARD WITH A SHRINKING BUDGET

• Collegial discussions are very important
• The good news in the data below are certainly relevant to remember
THANK YOU

Questions?
UNIQUE AND INNOVATIVE

services and collections
Library research information and use 2017-2018 FISCAL YEAR

- 2.3M+ PRINT VOLUMES
- 100K+ JOURNALS
- 3.7M ARTICLE DOWNLOADS
- 131 LIBRARY RESEARCH GUIDES covering 65+ subjects
- 480K E-BOOKS
- 11K+ THESSES AND DISSERTATIONS (UWATERLOO)
- 118K+ MATERIALS CHECKED OUT
Advancing research & inquiry

- Strategic collections
- Research impact
- Strategic planning
- Research and digital scholarship services review
CEE case study: Build graduate student skills

Under the supervision of CEE scholars, graduate students were expected to “take the lead” on these tasks.

- Data Management
- Data Generation & Analysis
- Literature Search
- Thesis Writing
- Publication of Results
- Archiving of Data & Artifacts

Graduate Students Leaving upon Degree Completion
Graduate Students Joining The Research Group

New and emerging

- New library catalogue -- expanded to 14 Ontario universities
- Scholarly communication and Open Access
- Copyright and Fair Dealing
- National research infrastructure
Supporting learners

Drop-in services

- Centre for Career Action
- Office of Research Ethics
- Student Success Office
- Writing and Communication Centre
- Research and assignment assistance

Library Ambassadors

- Peer engagement & outreach
- Research info building blocks
- Low barriers to getting assistance
Library research and learning expertise in action 2017-2018 FISCAL YEAR

9.5K RESEARCH QUESTIONS ANSWERED + 1.4K IN-DEPTH RESEARCH CONSULTATIONS

16 SUBJECT SPECIALIST LIBRARIANS
9 DATA MANAGEMENT and CURATION EXPERTS

17 RESEARCH GROUP SUPPORT PROJECTS including systematic and scoping reviews

320 INSTRUCTIONAL WORKSHOPS
12K WORKSHOP ATTENDEES
Library spaces and use 2017-2018 FISCAL YEAR

5 PUBLIC BUILDINGS
Dana Porter, Davis Centre, Musagetes, Optometry, Pharmacy

106 HOURS
open weekly

4 MEETING ROOMS
used 149 times

2 INSTRUCTIONAL SPACES
Learning lab, Computer lab

2.3M VISITORS LAST YEAR

1,858 SEATS

21 GROUP STUDY ROOMS
used 13K times
Revitalizing spaces

- Active teaching, learning and collaboration spaces
- More bookable study rooms
- New student lounge areas
- New study furniture and refreshed spaces
Innovation and resilience

- Planning, prioritizing innovative programs (MAP3)
- Staff-focused health, safety and wellness programs
- LEAN initiatives
- Excellence Canada – Silver
“Libraries are places for people, with information in them.”
Senate Graduate & Research Council met on 18 March 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 Engineering

1. **Motion:** To approve the addition of 5 specializations to the Master of Engineering (MEng) within the department of Systems Design Engineering effective Spring 2019, as presented in Attachment 1. These specializations include: (a) artificial intelligence and machine learning, (b) biomedical systems, (c) human factors, (d) mechatronics and physical systems, and (e) vision, image, and signal processing.

**Rationale:**
These specializations will add structure to the MEng program by allowing students to specialize in certain areas of study and receive recognition for that specialization from the Department 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 course based Masters, but also benefit from a certain level of focus in their course selection.

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

Program: Master of Engineering (MEng) in Systems Design Engineering

Program contact name(s): Janine Blair

Form completed by: Sarah Landy

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 MEng degree requirements to include 5 new specializations.

Is this a major modification to the program? Yes

Rationale for change(s):

These specializations will add structure to the MEng program by allowing students to specialize in certain areas of study and receive recognition for that specialization from the Department 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 course based Masters, but also benefit from a certain level of focus in their course selection.

Proposed effective date: Term: Spring Year: 2019

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-systems-design-engineering/master-engineering-meng-systems-design-engineering

<table>
<thead>
<tr>
<th>Current Graduate Studies Academic Calendar content:</th>
<th>Proposed Graduate Studies Academic Calendar content:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program information</strong></td>
<td><strong>Graduate specializations</strong></td>
</tr>
<tr>
<td>• Admit term(s)</td>
<td>• Artificial Intelligence and Machine Learning</td>
</tr>
<tr>
<td>o Fall</td>
<td>• Biomedical Systems</td>
</tr>
<tr>
<td>o Winter</td>
<td>• Human Factors</td>
</tr>
<tr>
<td>o Spring</td>
<td>• Mechatronics and Physical Systems</td>
</tr>
<tr>
<td>• Delivery mode</td>
<td>• Vision, Image and Signal Processing</td>
</tr>
<tr>
<td>o On-campus</td>
<td></td>
</tr>
<tr>
<td>• Length of program</td>
<td><strong>Program information</strong></td>
</tr>
<tr>
<td>o The normal duration of this program is</td>
<td>• Admit term(s)</td>
</tr>
<tr>
<td>16 months.</td>
<td>o Fall</td>
</tr>
<tr>
<td>• Program type</td>
<td>o Winter</td>
</tr>
<tr>
<td>o Master’s</td>
<td></td>
</tr>
<tr>
<td>o Professional</td>
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</tr>
</tbody>
</table>
Current Graduate Studies Academic Calendar content:

- **Registration option(s)**
  - Full-time
  - Part-time
- **Study option(s)**
  - Coursework

**Admission requirements**

- **Minimum requirements**
  - An Honours Bachelor’s degree (or equivalent) with at least an overall 75% standing from a recognized university.
  - A Graduate Record Examination (GRE) score is required for all students whose undergraduate degree is not from Canada or the USA.
- **Application materials**
  - Résumé
  - Supplementary information form
  - Transcript(s)
- **References**
  - Number of references: 3
  - Type of references: 2 academic
- **English language proficiency (ELP)** (if applicable)

**Degree requirements**

- **Graduate Academic Integrity Module (Graduate AIM)**
- **Courses**
  - Students must complete the following 2 core Systems Design Engineering graduate courses:
    - SYDE 600 Systems Theory, Models, Research & Design
    - SYDE 660 Systems Design Graduate Workshop 1
  - In addition to the 2 core courses, students must complete 6 Engineering graduate courses (0.50 unit weight per course) counting towards degree credit from the University of Waterloo satisfying the following criteria:
    - At least 2 Systems Design Engineering courses at the 500, 600 or 700 level.
    - At most 2 courses at the 500 level.
    - At least 3 courses at the 600 level.
  - All course selections are arranged by the student.
  - Note: these requirements are in addition to satisfactory completion of any transitional

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Proposed Graduate Studies Academic Calendar content:

- **Spring**
- **Delivery mode**
  - On-campus
- **Length of program**
  - The normal duration of this program is 16 months.
- **Program type**
  - Master’s
  - Professional
- **Registration option(s)**
  - Full-time
  - Part-time
- **Study option(s)**
  - Coursework

**Admission requirements**

- **Minimum requirements**
  - An Honours Bachelor’s degree (or equivalent) with at least an overall 75% standing from a recognized university.
  - A Graduate Record Examination (GRE) score is required for all students whose undergraduate degree is not from Canada or the USA.
- **Application materials**
  - Résumé
  - Supplementary information form
  - Transcript(s)
- **References**
  - Number of references: 3
  - Type of references: 2 academic
- **English language proficiency (ELP)** (if applicable)

**Degree requirements**

- **Graduate Academic Integrity Module (Graduate AIM)**
- **Courses**
  - Students must complete the following 2 core Systems Design Engineering graduate courses:
    - SYDE 600 Systems Theory, Models, Research & Design
    - 1 of:
      - SYDE 660A Systems Design Graduate Workshop 1 - AI and Machine Learning.
<table>
<thead>
<tr>
<th>Current Graduate Studies Academic Calendar content:</th>
<th>Proposed Graduate Studies Academic Calendar content:</th>
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<tbody>
<tr>
<td>courses that may be specified at the time of admission. Note: the Faculty of Engineering requires that no more than one-half of the courses used for credit toward a graduate degree may be taught by a candidate's supervisor(s). In the case of co-supervision in small research groups, it may be necessary to relax this rule; however, the student's file must contain a statement of formal approval from the Department and endorsement from the Associate Dean for Graduate Studies and Research in the Faculty of Engineering.</td>
<td>o SYDE 660B Systems Design Graduate Workshop 1 – Biomedical Systems, o SYDE 660C Systems Design Graduate Workshop 1 – Human Factors, o SYDE 660D Systems Design Graduate Workshop 1 – Mechatronic &amp; Physical Systems, o SYDE 660E Systems Design Graduate Workshop 1 - Vision, Image &amp; Signal Processing, or o SYDE 660 Systems Design Graduate Workshop 1</td>
</tr>
<tr>
<td>In addition to the 2 core courses, students must complete 6 Engineering graduate courses (0.50 unit weight per course) counting towards degree credit from the University of Waterloo satisfying the following criteria: ▪ At least 2 Systems Design Engineering courses at the 500, 600 or 700 level. ▪ At most 2 courses at the 500 level.</td>
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</tr>
<tr>
<td>Students in the MEng in Systems Design Engineering program may also choose to pursue one of the following five Graduate Specializations:</td>
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<tr>
<td>A Graduate Specialization is a University credential that is recognized on the student’s transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.</td>
<td></td>
</tr>
<tr>
<td>All MEng Graduate Specializations in Systems Design Engineering consist of a set of 4 graduate (0.50 weight) level courses and this set is comprised of a mix of specified and elective courses. Specified courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for</td>
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<td>Proposed Graduate Studies Academic Calendar content:</td>
<td>Current Graduate Studies Academic Calendar content:</td>
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<tr>
<td>each of the five Graduate Specializations are described below.</td>
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</table>

1. Graduate Specialization in Artificial Intelligence and Machine Learning

Students must satisfy the following:

3 Specified courses:
- SYDE 522 Machine Intelligence or SYDE 552 Computational Neurosciences
- SYDE 660A Systems Design Graduate Workshop 1 – AI and Machine Learning
- SYDE 675 Pattern Recognition

Elective courses (at least 1 course from the following list):
- SYDE 662 Systems Design Graduate Workshop 2
- SYDE 671 Advanced Image Processing
- SYDE 672 Statistical Image Processing
- SYDE 673 Video Processing & Analytics
- SYDE 674 3D Computer Vision & Imaging

2. Graduate Specialization in Biomedical Systems

Students must satisfy the following:

3 Specified courses:
- SYDE 660B Systems Design Graduate Workshop 1 – Biomedical Systems
- At least 2 from the following list:
  - SYDE 544 Biomed Measure & SIP
  - SYDE 684 Materials Biocompatability
  - SYDE 750 Topic 20 Topics in Systems Modelling: Modeling of Biomechanical Systems
  - SYDE 750 Topic 36 Topics in Systems Modelling: Assistive Tech and Rehab Eng

Elective courses (at least 1 from the following list or an additional course from the Specified course list):
- SYDE 552 Computational Neurosciences
- SYDE 556 Simulating Neurobiological Systems
Proposed Graduate Studies Academic Calendar content:

- SYDE 652 Dynamics of Multibody Systems
- SYDE 662 Systems Design Graduate Workshop 2
- SYDE 677 Medical Imaging

Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 544 is taken as a Specified course, then SYDE 552 and SYDE 556 cannot be taken to satisfy the Elective course requirement.

3. Graduate Specialization in Human Factors

Students must satisfy the following:

**3 Specified courses:**
- SYDE 660C Systems Design Graduate Workshop 1 – Human Factors
- At least 2 from the following list:
  - SYDE 542 Interface Design or SYDE 543 Cognitive Ergonomics
  - SYDE 642 Cognitive Engineering Methods
  - SYDE 644 Human Factors Testing

**Elective courses (at least 1 from the following list or an additional course from the Specified course list):**
- SYDE 533 Conflict Resolution
- SYDE 662 Systems Design Graduate Workshop 2
- SYDE 740 Advanced Cognitive Ergonomics

Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 542 or SYDE 543 is taken as a Specified course, then SYDE 533 cannot be taken to satisfy the Elective course requirement.

4. Graduate Specialization in Mechatronic and Physical Systems

Students must satisfy the following:

**3 Specified courses:**
- SYDE 660D Systems Design Graduate Workshop 1 - Mechatronic & Physical Systems
Current Graduate Studies Academic Calendar content:

5. Graduate Specialization in Dynamics and Control

Students must satisfy the following:

3 Specified courses:
- SYDE 553 Advanced Dynamics
- SYDE 652 Dynamics of Multibody Systems
- SYDE 655 Optimal Control
- SYDE 682 Advanced MEMS, Physics, Design & Fabrication
- SYDE 683 Modelling, Simulation & Design of MEMS
- SYDE 750 Modelling Continuum Systems

Elective courses (at least 1 from the following list or an additional course from the Specified course list):
- SYDE 531 Design Opt. under Probabilistic Uncertainty
- SYDE 631 Time Series Modelling
- SYDE 661 Model-based robust design
- SYDE 662 Systems Design Graduate Workshop 2

Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 553 is taken as a Specified course, then SYDE 531 cannot be taken to satisfy the Elective course requirement.

Proposed Graduate Studies Academic Calendar content:

- At least 2 from the following list:
  - SYDE 553 Advanced Dynamics
  - SYDE 652 Dynamics of Multibody Systems
  - SYDE 655 Optimal Control
  - SYDE 682 Advanced MEMS, Physics, Design & Fabrication
  - SYDE 683 Modelling, Simulation & Design of MEMS
  - SYDE 750 Modelling Continuum Systems

Elective courses (at least 1 from the following list or an additional course from the Specified course list):
- SYDE 531 Design Opt. under Probabilistic Uncertainty
- SYDE 631 Time Series Modelling
- SYDE 661 Model-based robust design
- SYDE 662 Systems Design Graduate Workshop 2

5. Graduate Specialization in Vision, Image and Signal Processing

Students must satisfy the following:

3 Specified courses:
- SYDE 660E Systems Design Graduate Workshop 1 - Vision, Image & Signal Processing
- At least 2 from the following list:
  - SYDE 575 Image Processing
  - SYDE 671 Advanced Image Processing
  - SYDE 677 Medical Imaging

Elective courses (at least 1 from the following list or an additional course from the Specified course list):
- SYDE 544 Biomed Measure & SIP
- SYDE 633 Remote Sensing Systems
- SYDE 662 Systems Design Graduate Workshop 2
<table>
<thead>
<tr>
<th>Current Graduate Studies Academic Calendar content:</th>
<th>Proposed Graduate Studies Academic Calendar content:</th>
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</thead>
<tbody>
<tr>
<td>o SYDE 672 Statistical Image Processing</td>
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<tr>
<td>o SYDE 673 Video Processing &amp; Analytics</td>
<td></td>
</tr>
<tr>
<td>o SYDE 674 3D Computer Vision &amp; Imaging</td>
<td></td>
</tr>
<tr>
<td>o SYDE 675 Pattern Recognition</td>
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</tr>
</tbody>
</table>

Note that only one 500 level course may be used to satisfy the requirements of a Graduate Specialization. Therefore, if SYDE 575 is taken as a specified course, then SYDE 544 cannot be taken to satisfy the Elective course requirement.

- All course selections are arranged by the student.
- Note: these requirements are in addition to satisfactory completion of any transitional courses that may be specified at the time of admission.

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

*Students who are already in the program will not have the option to avail of these specializations due to the requirement of new design courses which have not previously been offered*

**Departmental approval date (mm/dd/yy): 01/10/19**
**Reviewed by GSO (for GSO use only) ☒ date (mm/dd/yy): 01/22/2019**
**Faculty approval date (mm/dd/yy): 02/01/19**
**Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):**
**Senate approval date (mm/dd/yy) (if applicable):**
Faculty of Applied Health Sciences
Recreation and Leisure Studies

1. **Motion:** To approve the proposed Event Management Minor as described below, effective 1 September 2020.

Academic Requirements
1. The Minor is available to all University of Waterloo undergraduate degree students.
2. Normally, a maximum of two courses (1.0 unit) obtained on Letter of Permission or in transfer credit may be applied toward fulfilment of the Event Management Minor. These courses must be equivalent to the course requirements as assessed by the school/department offering the replaced course.
3. Students must complete the 2.0 units of required courses, and 2.0 units from the elective list. Successful completion of the 4.0 units with a cumulative average of 65% is required for the Minor.

**Required courses (2.0 units)**
- REC 215
- REC 219
- REC 319
- REC 419

**Elective courses (2.0 units)**
- AFM 123
- ENGL 210F
- ENGL 210G
- ENGL 295
- ENVIS 105
- HRM 200
- PACS 202
- PHIL 215
- PSCI 100
- PSCI 231
- PSYCH 238 or MSCI 211
- PSYCH 340
- REC 218
- REC 356
- SPCOM 204
SPCOM 223  
SPCOM 325  
SPCOM 433

Rationale: The Event Management Minor is designed to introduce students to the growing field of event studies. The Minor will explore foundational concepts and theories, and examine the impact of events on individuals and communities. Through community partnerships and experiential learning opportunities, students will plan, design, implement and assess events to achieve important outcomes, such as those related to social justice, inclusion, economic development, environmental sustainability, tourism development, sport development and community well-being. The Department of Recreation and Leisure Studies has received permission from the supporting departments to offer the listed courses as electives in the Event Management Minor.

**CHANGES TO ACADEMIC PLANS**

**Faculty of Engineering**

2. **Motion:** To approve the creation of three new special topic designations, Software Systems, Hardware Systems and Mechanical Systems, with a specific research focus for Mechatronics Engineering students, effective 1 September 2020.

The Faculty of Engineering proposes the creation of three new special topics designations with a specific research focus for Mechatronics Engineering students. Currently no special topics courses exist with an MTE course designation; ME course designations are being used for those special topics developed for MTE students. Enrolment in these courses by MTE students has been low, possibly due to the expectation that these courses are meant for Mechanical Engineering students only. Creating special topics with the MTE designation should rectify this issue. The calendar text for the proposed specializations is included as attachment #1 to this report.

**Faculty of Mathematics**

**Actuarial Science**

3. **Motion:** To approve the proposed changes to the structure of the Actuarial Science Option plans to a Plan 10 (Actuarial Science) and Plan 20 (Specialization), effective 1 September 2020.

The structure changes are as follows:

<table>
<thead>
<tr>
<th>Current Structure</th>
<th>Existing Plan 10</th>
<th>New Structure – Plan 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial Science/Finance Option</td>
<td>Actuarial Science</td>
<td>Finance <strong>Specialization</strong></td>
</tr>
<tr>
<td>Actuarial Science/Predictive Analytics Option</td>
<td>Actuarial Science</td>
<td>Predictive Analytics <strong>Specialization</strong></td>
</tr>
</tbody>
</table>

Rationale: Changing Actuarial Science plans to a Plan 10 (Actuarial Science) and a Plan 20 (specialization) will simplify the plans in the Faculty. Students can choose which calendar they would like to follow.

Mario Coniglio  
Associate Vice-President, Academic

/rmw
NEW COURSES  (for approval)

Mechanical and Mechatronics Engineering

Effective  01-SEP-2019
MTE  597  ( 0.50 )  LEC  Special Topics in Mechatronics Engineering: Software Systems
Various topics at the undergraduate level in mechatronics engineering with a focus on software systems. Courses offered when resources permit.

Rationale : Within the Mechanical and Mechatronics Engineering Department, several ME special topics courses have been developed specifically for Mechatronics Engineering students. This approach has been problematic, in that the ME courses have not experienced significant enrolment from students in this plan. It is the perception of the department and instructors, that the course descriptor is largely responsible, and students understandably believe that courses with an ME designation are primarily meant for Mechanical Engineering students. Creating special topics courses with the MTE designation should correct this issue.

Effective  01-SEP-2019
MTE  598  ( 0.50 )  LEC  Special Topics in Mechatronics Engineering: Hardware Systems
Various topics at the undergraduate level in mechatronics engineering with a focus on hardware systems. Courses offered when resources permit.

Rationale : Within the Mechanical and Mechatronics Engineering Department, several ME special topics courses have been developed specifically for Mechatronics Engineering students. This approach has been problematic, in that the ME courses have not experienced significant enrolment from students in this plan. It is the perception of the department and instructors, that the course descriptor is largely responsible, and students understandably believe that courses with an ME designation are primarily meant for Mechanical Engineering students. Creating special topics courses with the MTE designation should correct this issue.

Effective  01-SEP-2019
MTE  599  ( 0.50 )  LEC  Special Topics in Mechatronics Engineering: Mechanical Systems
Various topics at the undergraduate level in automation, process control, robotics, autonomous and intelligent systems, and electromechanical design. Courses offered when resources permit.

Rationale : Within the Mechanical and Mechatronics Engineering Department, several ME special topics courses have been developed specifically for Mechatronics Engineering students. This approach has been problematic, in that the ME courses have not experienced significant enrolment from students in this
plan. It is the perception of the department and instructors, that the
course descriptor is largely responsible, and students understandably
believe that courses with an ME designation are primarily meant for
Mechanical Engineering students. Creating special topics courses with the
MTE designation should correct this issue.
Faculty Achievements

Tamer Özsu, Cheriton School of Computer Science, was recognized with the 2018 Lifetime Achievement Award in Computer Science from CS-Can/Info-Can. Conferred annually since 2014, these prestigious national awards recognize faculty members in departments, schools and faculties of computer science who have made outstanding and sustained achievement in research, teaching and service. Özsu has contributed to fundamental advances in the field of databases and data management, provided leadership in professional and academic communities to which he belongs, and mentored countless students, many of whom have become accomplished researchers and industry leaders.

Özsu is the seventh faculty member in the Cheriton School of Computer Science to receive a Lifetime Achievement Award from CS-Can/Info-Can, following Distinguished Professor Emeritus Don Cowan (2017 recipient), Professor Emeritus Ric Holt (2017 recipient), Distinguished Professor Emeritus Janusz (John) Brzozowski (2016 recipient), University Professor J. Ian Munro (2016 recipient), Distinguished Professor Emeritus Alan George (2015 recipient), and Distinguished Professor Emeritus Frank Tompa (2015 recipient).

Canada Foundation for Innovation JELF Awards

Five Waterloo researchers have been awarded over $600,000 through the John R. Evans Leaders Fund (JELF) at CFI.

Parsin Haji Reza, Systems Design Engineering – Histological and functional photoacoustic remote sensing (HF-PARS) Microscopy ($91,830). Professor Haji Reza discovered and pioneered Photoacoustic Remote Sensing (PARS) microscopy, a novel absorption-based, non-contact, non-invasive, label-free imaging technique. The proposed research program aims to develop a unique and essential version of PARS technology for clinical and pre-clinical use, entitled Histological and Functional PARS (HF-PARS) which will provide critical information not currently possible to obtain. Long-term, the infrastructure (i.e., nanosecond lasers, multiwave length generation kit, and optical and mechanical component) will open new opportunities for clinical and pre-clinical applications including negative surgical margins in surgical oncology and functional ophthalmic imaging. The program will offer social, economic and academic benefits to Canada by training high-quality personnel, attracting top-tier individuals and international investments to Canada, providing unique solutions for the Canadian healthcare system and, ultimately, improving patient care and well-being.

Anna Klinkova, Chemistry – Nanocatalyst characterization and performance studies platform ($130,000). To foster the transition to a low emissions energy economy without compromising quality of life for the growing population, Professor Klinkova's research aims to develop electrocatalytic systems that utilize the excess electricity from renewable energy sources for the electrochemical conversion of CO2 to valuable products. Pivotal to this technology's success is the development of efficient, selective, and long-lasting catalytic materials. This infrastructure will enable a detailed understanding of how nanocatalyst structure influences chemical reactions by visualizing nanocatalyst structural features and their transformations under reaction conditions. It will also enable establishment of nanocatalyst design framework and development of transformative CO2reduction
technologies for industrial applications, while providing excellent training opportunities for the next generation of Canadian scientists.

**Sushanta Mitra**, Mechanical and Mechatronics Engineering – Infrastructure to characterize capillarity and wetting for under-liquid systems ($150,000). Understanding how drops wet a given surface is fundamental to the discovery and development of new materials. A recent surge of under-liquid applications has prompted Professor Mitra to look into wetting phenomena on surfaces submerged in surrounding liquid and open new research direction in capillarity and wetting. A custom-built contact angle measurement tool and microscopy system will be used to study under-liquid wetting dynamics and create a unique experimental facility for Canada for researchers and industry partners. The infrastructure will deliver scientific knowledge and transformative solutions toward the development of new materials (substrates) with broad impacts in terms of mitigating underwater dispersion of pollutants, materials discovery with tunable wetting properties, and pushing the frontiers of interface science.

**Janusz Pawliszyn**, Chemistry – Triple quadrupole mass spectrometer ($100,000). Professor Pawliszyn’s team aims to streamline the process of analyzing small molecules in biological samples (e.g., tissue, biofluids) through the development of low cost, practical, and quick analysis methods. Implementing these approaches for monitoring therapeutic drugs will reduce clinical analysis turnaround times, providing healthcare professionals with more accurate and reliable information faster, ensuring more precise drug treatment dosage administration to patients. By providing the tools to non-invasively monitor living tissues and organs during surgeries and other medical procedures, the door opens for an entirely new facet of personalized medicine. These tests have the potential to be implemented in clinical settings, as well as with law, environmental and food enforcement agencies. Building on cutting-edge developments already achieved using a mass spectrometer with extreme quantitative performance, this funding will support retaining the instrument in the lab permanently.

**Rodney Smith**, Chemistry – Spectroelectrochemical analysis of heterogeneous electrocatalysts ($130,000). Professor Smith’s research investigates solid-state electrocatalysts in an effort to expand the limited scope of electrochemical synthesis. His research extracts chemical information by developing innovative fabrication techniques and spectroscopic methodologies, and exploits the synergy between the two to gain insights into fundamental chemical behaviour. With this funding, the acquisition of a Raman microscope will enable his team to identify and track key structural features and study reaction mechanisms. The advances in fundamental understanding that will arise from the research will guide the development of more selective, efficient, and stable reaction systems. Expanding the scope of industrial electrosynthesis will foster growth of the technology in the chemical manufacturing sector, maximizing the value of renewable energy infrastructure and improving Canada’s ability to compete in clean-technology markets.

**National Research Council Canada (NRC) Collaboration**

National Research Council Canada (NRC) and the University of Waterloo is poised to establish a new Research Collaboration Center at Waterloo that will feature leading-edge research in the areas of Internet of Things, Artificial Intelligence and Cybersecurity. Ten NRC Scientists will move to Waterloo and work on joint projects with ten UW Professors. The collaboration will include joint supervision of graduate students and post-doctoral fellows, and the NRC Scientists and UW Professors will apply for external funding to support their research collaboration. It is envisaged that there will also be close interaction with industry. The Collaboration Center has an initial seven-year mandate with the possibility of renewal for an additional seven years.
Genome Canada/Ontario Genomics Project

Earlier this year, Bin Ma, Cheriton School of Computer Science, Faculty of Mathematics, received a Genome Canada/Ontario Genomics Project grant of $925,987 – the first Genome Canada grant led by Waterloo. He has since received funding from the Ministry of Economic Development, Job Creation and Trade for an ORF-BCB (Ontario Research Fund – Bioinformatics and Computational Biology Program) in the amount of $154,327.

International Research Partnership Grants

International Research Partnerships Grants are internal seed grants meant to further Waterloo researchers’ global collaborations with leading research institutions. Since 2011, 141 projects have been funded totalling $1.9 million that garnered $3 million in matching cash contributions that have subsequently generated over $19.5 million in new grants awarded to UW researchers. These projects have also resulted in 83 new innovations and technologies created (broadly defined), six patents and five startups.