University of Waterloo
SENATE
Notice of Meeting

Date: Monday 18 June 2018
Time: 3:30 p.m.
Place: Needles Hall, room 3407

	OPEN SESSION	Action
3:30	**Consent Agenda** **Motion:** To approve or receive for information by consent items 1-6 below.	
	1. Minutes of the 22 May 2018 Meeting	Decision
	2. Reports from Committees and Councils	
	a. Graduate & Research Council	Information
	b. Undergraduate Council	Decision/Information
	3. Report of the President	
	a. Recognition and Commendation	Information
	4. Reports from the Faculties	Information
	5. Committee Appointments	Decision
	6. Report of the Vice-President, Academic & Provost	
	a. University Research Chairs	Information
	Regular Agenda	
3:35	7. Business Arising from the Minutes	Information
3:40	8. Research Presentation – Alexander Wong, Canada Research Chair in Artificial Intelligence and Medical Imaging Systems	Information
	9. Reports from Committees and Councils	
3:50	a. Graduate & Research Council	Decision
4:00	b. Undergraduate Council	Decision
4:10	10. Report of the President	Information
4:20	11. Q&A Period with the President	Information
4:30	12. Report of the Vice-President, Academic & Provost	Information
	13. Report of the Vice-President, University Research	
4:40	a. Canada Research Chairs – Revised Policy	Decision
4:50	b. June Update	Information
	14. Report of the Dean of Arts	
5:00	a. Changes to Faculty of Arts Constitution	Decision
5:10	15. Other Business	
	a. Delegation of Authority – Chair of the Dean of Applied Health Sciences Nominating Committee and the Dean of Arts Nominating Committee	Decision

	CONFIDENTIAL SESSION	
5:15	16. Minutes of the 22 May 2018 Meeting	Decision
5:20	17. Business Arising from the Minutes	
5:25	18. Report from Committees	
	a. Chancellor Nominating Committee*	Decision
	b. Nominating Committee for Honorary Degrees	Decision
	19. Other Business	
5:35	a. Student Matter*	Decision

11 June 2018

Karen Jack
University Secretary
Secretary to Senate

KJJ/ees

*To be distributed at meeting

University of Waterloo
SENATE
Minutes of the Monday 22 May 2018 Meeting

Present: Bilal Akhtar, Jean Andrey, Sandra Banks, Steven Bednarski, Katherine Bergman, Kankar Bhattacharya, Carmen Bruni, Kofi Campbell, Claudio Canizares**, Jeff Casello, Fred Chereshski**, David Clausi, Mario Coniglio, Eric Croiset, Shannon Dea, Peter Deadman, Charmaine Dean, George Dixon, Mathieu Doucet, Tia Driver, Fraser Easton, David Edwards, Marlene Epp, Paul Fieguth, Wendy Fletcher, George Freeman, Matthew Gerrits, Mark Giesbrecht, Julia Goyal, Kelly Grindrod, Feridun Hamdullahpur (chair), Dennis Huber, Marios Ioannidis, Karen Jack (secretary), Craig Janes, Spiro Karigiannis, Martin Karsten, Scott Kline, Alysia Kolentsis, Robert Lemieux, Kesen Ma, Tyler Marques**, Teferi Mergo, Ian Milligan, Katie Misener, Grant Mitchell, Barbara Moffatt, Richard Myers, Catherine Newell Kelly, Erin O'Connell, Linda Ogechi Iheme, Douglas Peers, William Pristanski, Neil Randall, Max Salman, Hannah Sesink, Marcus Shantz, Joanne Shoveller, James Skidmore, Richard Staines, Paul Stolee, Pearl Sullivan, Tomson Tran, Maya Venters, Stephen Watt, Dan Wolczuk, Richard Wu, En-Hui Yang

Guests: Bruce Campbell, Aldo Caputo, Donna Ellis, Robert Danisch, Ross Johnston, Andrea Kelman, Jennifer Kieffer, Derek Madge, Nick Manning, Diana Parry, Leanne Perreault, Chanakya Ramdev, Ian Rowlands, Nadia Singh, Emily Schroeder, Daniela Seskar-Hencic, Allan Starr, Brandon Sweet, Mark Weber

Absent: Michael Balogh*, Chris Bauch*, Anne Bordeleau*, Brian Cepuran*, Tara Collington*, Simon Courtenay*, Joan Coutu*, Cindy Forbes*, Shikha Gandhi, Robert Gorbet*, Craig Hardiman*, Thorsten Heins*, Tom Jenkins*, Mungo Marsden, Daniel O'Connor*, Naima Samuel*, Beth Sandore Namachchivaya, Mark Seasons*, Susan Tighe*, Hamid Tizhoosh*, Bryan Tolson*, Ross Willard*

*regrets
**telephone

OPEN SESSION

CHAIR'S REMARKS

The president introduced new and returning members: Steven Bednarski, Kankar Bhattacharya, Fred Chereshski, David Clausi, Joan Coutu, Eric Croiset, Peter Deadman, Fraser Easton, Robert Gorbet, Kelly Grindrod, Marten Karsten, Kesen Ma, Tyler Marques, Teferi Mergo, Ian Milligan, Barbara Moffatt, Erin O'Connell, Linda Ogechi Iheme, Max Salman, Naima Samuel, Hannah Sesink, Richard Staines, Paul Stolee, Maya Venters, and Richard Wu. A round of applause followed.

Consent Agenda

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

Gerrits and Skidmore.

1. MINUTES OF THE 16 APRIL 2018 MEETING
Senate approved the minutes of the meeting.

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

Nominating Committee for Honorary Degrees. Senate received the report for information.

Undergraduate Council. Senate heard the following motions:

Faculty of Mathematics, Extended Withdrawals and Absences
Motion: That Senate approve the deletion of the section titled "First-year Withdrawal" under the section "Extended Absences and Withdrawals" effective 1 September 2019.

Faculty of Mathematics, Degree Requirements
Motion: That Senate approve the deletion of the maximum allowed units of course attempts in "Table I – Degree Requirements" effective 1 September 2019.

Faculty of Mathematics, Academic Standing within the Faculty
Motion: That Senate approve the deletion of certain conditions related to the requirement to withdraw from the Faculty, as identified in the report, effective 1 September 2019.

Motion: That Senate approve the addition of the plans identified below to the section "Specific Invalid Multiple-Plan Combinations" effective 1 September 2019.

Registrar's Office, Drop/Add Deadlines
Motion: That Senate approve the following additions to and deletions from the undergraduate calendar related to drop/add deadlines effective 1 September 2019 (see report).

Faculty of Mathematics, Academic Plan Inactivation
Motion: That Senate approve the inactivation of the Health Informatics Option, effective 1 September 2018.

Senate received the remainder of the report for information.

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

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

5. COMMITTEE APPOINTMENTS
Senate heard a motion to change the COU Academic Colleague, Marios Ioannidis' term end date from 30 June 2018 to 30 June 2019.

With respect to a question as to the lack of information in the final assessment report of the Department of Philosophy re: ties to the strategic plan, and a concern that the report seems overly inward looking, Peers advised that the purpose of these reports is to undertake a review of things as they are. He advised Senate that discussions are being held within the department and the Faculty re: strategic planning.

The question was called, and the motion carried unanimously.

<u>Regular Agenda</u>

6. BUSINESS ARISING FROM THE MINUTES
Further to a question raised at the last meeting re: the University's responsibilities under the *Fair Workplaces Act*, Dixon advised that the University will abide by what is required, but there remains a lack clarity on some aspects. Work with COU is taking place on this front, and a legal opinion is being sought.

7. TEACHING PRESENTATION

Coniglio introduced Robert Danisch, chair, Drama and Speech Communication who gave a presentation titled, "Arts First: Building Community and Agency." Danisch informed members about the "Arts First" initiative, detailing: its two small, required communications courses; its outcomes; its intentions to build a community of practice and agency; positive student feedback.

In response to questions, Danisch advised that holistic rubrics are used in assessments, agreed that graduate students would benefit from the courses too, and spoke to his role in enabling conversations re: cultural differences.

8. REPORTS FROM COMMITTEES AND COUNCILS

Executive Committee.
Senate heard a motion to acclaim the remaining membership of Senate committees and councils and the Board of Governors as provided on the list of nominees.

Dea and Casello.

The question was called and the motion carried unanimously.

Graduate & Research Council
Faculty of Arts, Graduate Admissions Pathway. Senate heard a motion to create an Admissions Pathway between the University of Waterloo Department of Economics and the School of Economics at Shanghai University of Finance and Economics (SUFE), for programming beginning 1 September 2018, as presented in the attachment.

Casello and Peers. Carried unanimously.

Undergraduate Council
Faculty of Arts, Honours Liberal Studies. Senate heard a motion to approve a major modification to the liberal studies plan to create a new honours liberal studies plan as described in the report, effective 1 September 2019.

Coniglio and Peers. Carried unanimously.

9. REPORT OF THE PRESIDENT

The president introduced Diana Parry, associate vice-president, human rights, equity, and inclusion, to present the annual update on the HeForShe campaign. Members heard about the University's commitments, outcomes and activities, the leadership program, progress against the commitments, the Faculty advocates, and recent highlights and future considerations. Members also heard that a new Director of Equity has been hired, Gina Hickman. A round of applause followed for Parry and the chair for their work on this front.

In response to questions, Senate heard: statistics are being kept for chairs and higher in the Faculty realm, and Human Resources is tracking data from the staff perspective; where Parry is directing key efforts to ensure progress is being made.

The chair offered a wide-ranging update, including: offering kudos to Slim Boumazia for his recent NSERC Synergy Award for Innovation; advice that an update on the PAC-SMH's implementation is coming soon; a celebration of the University's success in research funding; advice that early reports re: enrollment look positive; a brief outline of the recent situation in which an outside group wished

to host a controversial speaker at a Waterloo facility, and the University's commitment to free speech.

10. Q&A PERIOD WITH THE PRESIDENT
There were no questions.

11. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST
Roster of Graduands. Senate heard a motion to delegate approval of the roster of graduands to the Executive Committee for its 4 June 2018 meeting.

Dixon and Bergman. Carried unanimously.

Revised Fall 2018 Convocation Dates in Calendar. Senate heard a motion to approve the revised 2018-19 calendar dates as presented in attachment 1 of the report.

Newell Kelly and Andrey. Carried unanimously.

12. REPORT OF THE DEAN OF ARTS
Department Name Change. Senate heard a motion to recommend to the Board of Governors the following name change: "Department of Drama and Speech Communication" to Department of Communication Arts," effective 1 September 2018.

Peers and Randall.

Peers spoke to the consultation undertaken by the department and Faculty about the proposed change. He also highlighted the importance of the change to the department: the current name does not resonate with prospective students, and changes in the department in terms of faculty complement and course offerings make the proposed name preferable.

The question was called, and the motion carried unanimously.

13. REPORT OF THE DEAN OF ENGINEERING
New Academic Unit – Change the Name and Structure of the Conrad Centre. Senate heard a motion to recommend to the Board of Governors that the name of the Conrad Business, Entrepreneurship and Technology Centre be changed to the "Conrad School of Entrepreneurship and Business" within the Faculty of Engineering, and that it be granted forma status as an academic unit.

Sullivan and Peers.

Sullivan spoke to the submission and advised Senate of the further consultation undertaken by Mark Weber following the March meeting. Members heard that the proposal received unanimous approval by Engineering Faculty Council.

Weber advised: since the last visit, SGRC had the opportunity to discuss the proposal and was positive about it; the change is largely housekeeping in nature and ensures a proper governance structure for hiring. In discussion: a position by a senator that in his estimation the proposed change is more than housekeeping since "technology" is being dropped (a response that technology is part of what CBET does, but it also has other programs that do not touch that realm, CBET wanted to clarify that, and not "over-reach"; a review of the proposed department's academic plans is forthcoming); concern from another senator that the proposed name does not make sense to him (a response that "business" is not limited to any one Faculty, and a reminder that Senate recently approved a school including the word "business" in another Faculty); concern over the use of the term "school"

(clarification that there is no standard definition, and most schools at the University began with small numbers); a suggestion that "technology" should not be removed from the title (a response that there are several departments on campus which offer programs with different titles than the department's name); support for the proposal from several members; a suggestion that Senate Undergraduate Council consider this (a response that since there is no undergraduate plan, that would be inappropriate).

The question was called, and the motion carried with 39 for, nine against and three abstentions.

14. REPORT OF THE VICE-PRESIDENT, UNIVERSITY RESEARCH

Following Dean's acknowledgment of the deans' efforts in ensuring the outstanding research support from the tri-councils, Senate received the report for information.

15. OTHER BUSINESS

There was no other business.

Senate convened in confidential session.

9 June 2018

Karen Jack
University Secretary
Secretary to Senate

CONFIDENTIAL SESSION

The confidential minutes have been removed.

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
Report to Senate
18 June 2018

Senate Graduate & Research Council met on 14 May 2018 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 new courses, course inactivation, minor program revisions for the Faculty of Arts (anthropology, classical studies, political science), as well as new courses, course revisions, and a minor program revision for the Faculty of Mathematics (combinatorics and optimization, master of mathematics for teachers, pure mathematics).

GRADUATE AWARDS

On behalf of Senate, council approved the RBC Graduate Scholarship in Cybersecurity (trust), the RBC Outstanding Thesis Award in Cybersecurity in the Quantum Era (trust) and the Mathematics Domestic Doctoral Scholarship (operating).

/kw

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

Charmaine Dean
Vice President, University Research

University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Report to Senate
18 June 2018

Senate Undergraduate Council met on 15 May 2018 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 Mathematics

1. Policy for Late Switches from Advanced MATH Courses to the Regular Equivalents

Motion: To add CO 255 and CO 250 to the list of courses in the chart under "Policy for Late Switches from Advanced MATH Courses to the Regular Equivalents," effective 1 September 2019.

Background and Rationale:

The current policy can be found at: http://ugradcalendar.uwaterloo.ca/page/MATH-Math-Faculty-Policies#averages

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

…
Policy for Late Switches from Advanced MATH Courses to the Regular Equivalents
At any time before the end of the "Drop, Penalty 1" period, students may switch from an advanced section MATH or STAT course to the equivalent course at the regular honours level:

Advanced Section	Regular Section
CO 255	**CO 250**
MATH 145	MATH 135
MATH 146	MATH 136
MATH 147	MATH 137
MATH 148	MATH 138
MATH 245	MATH 235
MATH 247	MATH 237
MATH 249	MATH 239
STAT 240	STAT 230
STAT 241	STAT 231

Students making this kind of switch will normally only be graded based on course elements from the regular section course. Any grades from the advanced section course will be disregarded. Students are responsible for making up any material in the regular section course that they may have missed, and are required to discuss their situation with the regular section instructor as soon as possible after making the switch.
…

Rationale for the change: CO 255 is the advanced section of CO 250 and has been following the policy for the advanced sections. The purpose of this change is to explicitly add such a policy to the calendar.

ACADEMIC PLAN INACTIVATIONS
Faculty of Science

2. Honours Science and Aviation – Earth Sciences Specialization and Physics Specialization

Motion: To approve the inactivation of the Honours Science and Aviation – Earth Sciences Specialization and Honours Science and Aviation – Physics Specialization, effective 1 September 2019.

Background and Rationale:
There are a small number of students who complete these specializations. Students who struggle in these specializations, have difficulty catching up if they change specialization or remove a specialization. Additional scheduling constraints are required for a small number of students.

FOR INFORMATION

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

- minor plan changes for: arts (honours French, intensive French and francophone literatures and cultures specialization); engineering (option in artificial intelligence); engineering and mathematics (software engineering); environment (geography and environmental management 3-year general, urban studies minor); mathematics (bachelor of computer science, computational mathematics minor, math/CPA plan, math/CPA finance option, pure mathematics/teaching plan, mathematics/teaching plan); science (honours biomedical science; honours biology; honours biology, animal specialization; honours biology, biotechnology specialization; honours biology, environmental biology specialization; honours biology, microbiology specialization; honours biology, molecular genetics specialization; honours biology, plant biology specialization; honours co-operative biology; honours co-operative biology, animal biology specialization; honours co-operative biology, biotechnology specialization; honours co-operative biology, environmental biology specialization; honours co-operative biology, microbiology specialization; honours co-operative biology, molecular genetics specialization; honours co-operative biology, plant biology specialization; honours biochemistry; honours co-operative biochemistry; honours biochemistry, biotechnology specialization; honours life physics; honours co-operative life physics; honours life physics – biophysics specialization; honours co-operative life physics – biophysics specialization; honours life physics – medical physics specialization; honours co-operative life physics (medical physics specialization); honours co-operative science and business, biology specialization; honours co-operative science and business, biochemistry specialization; medical physiology minor; honours science and aviation; replacement of SCCOM 100 with ENGL 193/SPCOM 193 in all plans).
- new courses for: arts (speech communications, English language and literature, sociology and legal studies, human rights, indigenous studies); engineering (architecture); environment (dean of

environment, knowledge integration); mathematics (statistics & actuarial sciences).

- course changes for: arts (music, English language & literature, social development studies, social work); engineering (society, technology & values centre); environment (dean of environment, the school of environment, resources & sustainability, geography & environmental management, knowledge integration, school of planning); mathematics (combinatorics & optimization, mathematics, pure mathematics); science (biology, chemistry).
- course inactivations for: science (biology, communication in science).

Mario Coniglio
Associate Vice-President, Academic

/rmw

University of Waterloo
SENATE
Report of the President
18 June 2018

FOR INFORMATION

Recognition and Commendation

Michael Cormier, a PhD student in the David R. Cheriton School of Computer Science, was awarded the 2018 **Murray Martin Prize for Best Research Paper by a Math Grad Student**. His winning paper "Purely vision-based segmentation of web pages for assistive technology," co-authored with supervisor Dr. Robin Cohen, is published in a special issue on assistive computer vision and robotics in the journal *Computer Vision an Image Understanding*. Grounded in computer vision, a subfield of artificial intelligence research, this work hinges on the clever insight that web pages can be considered as visual images. Cormier used this foundation to design a novel computer vision model that segments web pages both hierarchically and optimally by using a Bayesian approach to detect edges, and which also considers classification. Vision-based methods are not sensitive to implementation language or complexity, meaning this innovative model has applications far and wide in accessible technologies. His foundational work creating this model offers rich information and novel insights that form a viable launch pad for future computer vision research to take off from. A direct application of this work to the field of assistive technology is improving systems that produce alternative presentations of text. It enables users, especially those with cognitive and visual challenges, to interact with web pages through a series of augmented experiences. Practical functions like decluttering pages or zooming preferentially, are desirable for everyday use. The $3,060 Murray Martin scholarship is made possible thanks to generous donation from Pitney Bowes Inc. in honour of Murray Martin, the retiring chair, president, CEO and director whose continued investment in research and development has ensured the company's industry leadership. (adapted from *Cheriton School of Computer Science News*, 24 April 2018)

Professor and Distinguished Teacher **John North** celebrates his **50th year** at University of Waterloo this year. He has taught more than 20,000 students at Waterloo. Originally from British Columbia, North anticipated staying with the University for only a year before returning home. While North's five-decade stay wasn't part of his original plan, he credits Waterloo's top students and good relations with colleagues and University administration as big influencers. "But even more than that, the freedom to teach," says North. "To teach what I love to teach and to do research which I find engrossing. It's a fine thing at my age to come and go with young people in their late teens and 20's." In reflecting, North also highlights Waterloo's unique encouragement of faculty to form companies for the marketing and development of their research, a pivotal policy which has contributed to the economic development of KW. His own company, North Waterloo Academic Press, has published volumes by many scholars, as well as his own 69-volume *Waterloo Directory of English Newspapers and Periodicals 1800-1900*, reviewed as "the fourth great Humanities reference work of Great Britain, after Johnson's *English Dictionary*, the *Dictionary of National Biography* and the *Oxford English Dictionary*." This series now includes Scottish, Irish and Welsh periodicals. More than 400 students have worked with North on this project.
The *Directory* enables scholars to identify primary sources, as well as the scholarship on each title, and then to read the full text by hyperlink from within the *Waterloo Directory*. This includes some 70,000 newspapers and periodicals, in all subjects, so users can read press reports of the day, such as the coronation of Queen Victoria, the ravages of cholera, the première of Handel's *Israel in Egypt* at the 1846 Birmingham Music Festival, and the Crimean War. Alongside his teaching, North volunteers in Spiritual Care at Grand River Hospital and welcomes refugees arriving in Kitchener-Waterloo. (adapted from *Waterloo Stories*, 25 April 2018)

University of Waterloo student **Chloe Jang** has won **Waterloo Region's Outstanding Youth Award**. Jang, a third-year biomedical sciences student, received the award at the Volunteer Impact Awards ceremony on April 19 at the Waterloo Region Museum. Jang was recognized for her volunteerism efforts at the University Gates Senior Residence, Grand River Hospital, Sanctuary Refugee Health Centre, and the Student Success Office's International Peer Community Program. Jang also founded the Association Supporting Children's Educational

Nurturing and Development (ASCEND), a unique summer camp initiative that helps Syrian refugee children adjust to Canadian society and culture. The program has expanded to offer an integrated ESL program aimed at helping immigrant families. Jang was among fourteen individuals, teams and organizations honoured with the Volunteer Impact Awards, which are presented by the Volunteer Action Centre. (adapted from the *Daily Bulletin*, 27 April 2018)

Waterloo Engineering professor **Slim Boumaiza** was honoured at Rideau Hall in Ottawa for his research on wireless communications networks with two industry partners. Boumaiza, an electrical and computer engineering professor who heads the Emerging Radio Systems Group (EmRG), is one of 20 scientists and engineers to be recognized at a ceremony attended by Governor General Julie Payette and other dignitaries. He is receiving a $200,000 research grant as the winner in one of four **Synergy Awards for Innovation** categories sponsored by the Natural Sciences and Engineering Research Council of Canada (NSERC) for outstanding examples of industry-academia collaboration. The award recognizes Boumaiza's work with Ericsson Canada Inc. and Keysight Technologies Canada Inc. to find ways to build energy-efficient radio-communications systems that minimize the environmental impacts and operational costs of 4G infrastructure. A citation by NSERC notes his research is paving the way for 5G, or fifth-generation, wireless networks, which involve "a combination of ingenuity and enterprise that can only be achieved by collaboration between industry and academia." In addition to setting the stage for 5G networks, it notes, Boumaiza and his industry partners are helping train the new engineers who will be at the forefront of wireless communications research and development in the future. The event at Rideau Hall honoured the winners of NSERC's six national prizes totalling $3.72 million. (adapted from *Faculty of Engineering News*, 27 April 2018)

Eight University of Waterloo researchers have been named new or renewing **Canada Research Chairs (CRC)**. The announcement made by the Government of Canada is part of national funding for CRCs worth $158 million. An additional $8.3 million awarded to researchers across the country from the Canada Foundation for Innovation (CFI) for research infrastructure will be associated with the new Chair awards through the John R. Evans Leaders Fund, which includes funding for one Waterloo researcher. The recipients are:

Arts

- **Abigail Scholer** (Psychology) – SSHRC Tier 2 Renewal: Motivated Social Cognition ($500,000 over five years)

Engineering

- **Zhongwei Chen** (Chemical Engineering) – NSERC New Tier 1: Advanced Materials for Clean Energy ($1.4 million over seven years)
- **Ehsan Toyserkani** (Mechanical and Mechatronics Engineering) – NSERC New Tier 1: Multi-Scale Additive Manufacturing ($1.4 million over seven years)
- **Norman Zhou** (Mechanical and Mechatronics Engineering) – NSERC New Tier 1: Advanced Materials Joining and Processing ($1.4 million over seven years)

Environment

- **Brian Doucet** (School of Planning) – SSHRC New Tier 2: Urban Change and Social Inclusion ($500,000 over five years)

Science

- **Roger Melko** (Physics and Astronomy) – NSERC Tier 2 Renewal: Computational Quantum Many-Body Physics ($500,000 over five years)
- **Kevin Resch** (Physics and Astronomy) – NSERC Tier 2 Renewal: Optical Quantum Technologies ($500,000 over five years)
- **Mark Servos** (Biology) – NSERC Tier 1 Renewal: Water Quality Protection ($1.4 million over seven years) and John R. Evans Leaders Fund: Enhanced Assessment of Multiple Stressors ($149,000)

(adapted from the *Daily Bulletin*, 10 May 2018)

The Labour Market Information Council (LMIC) has named Waterloo professors **Ellen MacEachen** and **Ana Ferrer** to a newly formed 14-person **Labour Market Information Experts Panel**. The members are drawn from across the country and include academics from universities such as the University of Ottawa, New Brunswick and the Université de Montréal, as well as other industry experts. The LMIC created the panel to help guide the development, evolution and priorities of the Council. MacEachen, professor and associate director in the School of Public Health and Health Systems, researches the design and performance of work and health systems in relation to fast-changing economic, social and technological environments of the global economy. Ferrer, an Economics professor and incoming associate dean of Arts, Research, examines the economic implications of immigration, education and family economics. The LMIC identifies cross-Canadian priorities for the collection, analysis and distribution of labour market information, and helps get better value from existing labour market information investments across Canada. It also fosters the exploration of new opportunities for collaboration between governments and stakeholders. (adapted from the *Daily Bulletin*, 14 May 2018)

Each year, the Centre for Teaching Excellence and Graduate Studies and Postdoctoral Affairs recognize and celebrate the teaching development efforts of a Waterloo graduate student with the **Certificate in University Teaching (CUT) Award**. **Caitlin Scott** from the School of Environment, Resources and Sustainability is this year's recipient. The award honours Caitlin's commitment to implementing feedback for the continuous improvement and development of her teaching, her thoughtful approach to assessing student learning, and the practice of reflection that she regularly brings to her work as an instructor. Caitlin is a PhD candidate in Social and Ecological Sustainability. Her research examines the role of corporate actors in governance at the intersection of health and the environment. (adapted from the *Daily Bulletin*, 18 May 2018)

University of Waterloo
REPORT OF THE DEAN OF APPLIED HEALTH SCIENCES TO SENATE

June 18, 2018

FOR INFORMATION

A. APPOINTMENTS

New Probationary-term Appointment

DOMINELLI, PAOLO, Assistant Professor, Department of Kinesiology, January 1, 2019. Professor Dominelli received his B.H.K. (2012) and his MSc (2012) and his PhD (2016) at the University of British Columbia and did a postdoctoral fellowship (2017) at the Mayo Clinic in Minnesota. Dr. Dominelli's research focuses on integrative human exercise physiology. His research expertise in the area of cardiorespiratory and cardiovascular physiology and the relationship to human health and performance is strongly aligned with the educational and research foci within the Department of Kinesiology.

Definite Term Research Re-appointment

BOYKO, Jennifer, Assistant Research Professor, Faculty of Applied Health Sciences, Propel Centre for Population Health Impact, July 1, 2018 – January 31, 2019.

Adjunct Appointments

Graduate Supervision and Research

DAVIES, Hugh, Associate Professor, school of Public Health and Health Systems, June 1, 2018 – June 30, 2021.

Research

GROUCHY, Michelle, Assistant Research Professor, Faculty of Applied Health Sciences, Schlegel-UW
Research Institute for Aging, May 1, 2018 – April 30, 2019.

Special Appointments

Undergraduate Instruction

BEYER, Kit, Lecturer, Department of Kinesiology, May 1, 2018 – August 31, 2018.

Research Associate

DAWCZYK, Anna, Research Associate, Department of Recreation and Leisure Studies, May 1, 2018 – April 30, 2019.

Paul Stolee, Interim Dean
Faculty of Applied Health Sciences

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF THE FACULTY OF ARTS TO SENATE
June 18, 2018

FOR INFORMATION

A. APPOINTMENTS

Probationary Term Appointments

JIANG, Xin (Daniel), (BA 2010 Nankai University, PhD 2018 (expected) The Pennsylvania State University), Assistant Professor, School of Accounting and Finance, August 1, 2018 to June 30, 2021. Daniel's research interests include informed traders' disclosure, corporate investment, earnings management, and debt contracting. His teaching interests include undergraduate teaching in managerial accounting. In 2017, he received the J. Michael Cook Doctoral Consortium Fellow from the AAA/Deloitte Foundation. He will contribute to the School of Accounting and Finance by strengthening research and teaching in management accounting.

KLEIN, Sarah, (BA 2003 Trent University, MA 2006 New York University, PhD 2017 University of California, San Diego), Assistant Professor, Department of Drama and Speech Communication, July 1, 2018 to June 30, 2021. Sarah is an ethnographer of science whose research focuses on the ways in which cognitive scientists design, perform, transmit, and understand their experiments. She brings expertise in performance studies, science and technology studies, and communication studies to the department, and will help develop communication courses for students in the Faculty of Science.

LOVE, Heather, (BA 2006 University of Victoria, MA 2007 Queen's University, PhD 2015 Indiana University), Assistant Professor, Department of English Language and Literature, July 1, 2018 to June 30, 2021. Dr. Love joins UW from the Department of English, University of South Dakota (Vermillion), where she has been an Assistant Professor since 2015. The author of numerous articles on cybernetics and modernism, Dr. Love has also published in the *IEEE Technology and Society Magazine*. She will be integral to the Department's involvement with the University Communication Outcomes Initiative (UCOI).

SVEC, Henry, (BA 2005 Mount Allison University, MA 2008 PhD 2013 University of Western Ontario), Assistant Professor, Department of Drama and Speech Communication, July 1, 2018 to June 30, 2021. Henry's research and creative work focuses on digital culture, media, sound, and performance. He has written extensively about how media theorists and practitioners can reimagine contemporary communication systems as channels of solidarity and freedom. His teaching experience ranges from sound production to first year writing and public speaking courses and will help build on a range of different departmental strengths.

WU, Kaishu, (BBA 2010 Zhejiang Gongshang University, Master of Accounting 2011 University of Oregon, Lundquist College of Business, PhD 2018 (expected) University of Oregon, Lundquist College of Business), Assistant Professor, School of Accounting and Finance, July 1, 2018 to June 30, 2021. Kaishu's research interests include incentives and opportunities of corporate tax avoidance. His teaching interests include undergraduate courses in taxation. In 2017, he received the Robin & Roger Best Research Award and he has held a University of Oregon Accounting Doctoral Fellowship since 2013. Kaishu will contribute to the School of Accounting and Finance by strengthening research and teaching in taxation.

YE, Hua, (Bachelor of Management 2008 Central China Normal University, PhD 2012 National University of Singapore), Assistant Professor, School of Accounting and Finance, August 1, 2018 to June

30, 2021. Jonathan's research interests include innovation in mobile data services applications, crowdsourcing and open innovation and user generated content and social media. His teaching interests include management information systems. In 2017 he was awarded the Research Excellence Award by the University of Auckland Business School. Jonathan will contribute to the School of Accounting and Finance by strengthening research and teaching in information systems.

Probationary Term Appointments – Change in Date

MA, Xuyang, Assistant Professor, School of Accounting and Finance, **from** May 1, 2016 to June 30, 2019 **to** May 1, 2016 to June 30, 2020.

Definite Term Appointments

NEAL, Carter, (BA The University of Virginia 1998, MA 2008, PhD 2016 Indiana University), Lecturer, Department of English Language and Literature, July 1, 2018 to June 30, 2021. With expertise in professional, technical, and business communication, Dr. Neal has been a Visiting Lecturer in the Department of English, University of South Dakota for the past two years. He will be integral to the Department's involvement with the University Communication Outcomes Initiative (UCOI).

DUCHARME, Robert, (MAcc University of Waterloo 1997), Lecturer, School of Accounting and Finance, May 1, 2018 to April 30, 2019. Rob holds his CPA designation and has twenty-five years work experience with the Chartered Professional Accountants firm of Vodden,Bender & Seebach LLP. He has been an adjunct with the School since 2005 and has taught financial and managerial accounting courses. Rob will contribute to the School of Accounting and Finance by strengthening the teaching in both financial and management accounting.

SELINGER, Megan, (BA 2008, MA 2009 York University, PhD 2016 University of Western Ontario), Lecturer, Department of English Language and Literature, July 1, 2018 to June 30, 2021. With expertise in professional, technical, and business communication, Dr. Selinger has been an instructor at Conestoga College for the past two years. She will be integral to the Department's involvement with the University Communication Outcomes Initiative (UCOI).

Definite Term Reappointments

DADEY, Bruce, Lecturer, Department of English Language and Literature, May 1, 2018 to April 30, 2019.

HARRIGAN, Kevin, Lecturer, Faculty of Arts, May 1, 2018 to April 30, 2019.

SUD, Bharat, Lecturer, Department of Economics, January 1, 2019 to August 31, 2020.

YANG, Vivian (Xiaofei), Lecturer, Department of Economics, August 1, 2018 to July 31, 2021.

Visiting Appointment

BURKETT, Jodi, Visiting Scholar, Department of History, January 7, 2019 to March 31, 2019.

SHERFEY, Jason, Visiting Scholar, Department of Philosophy, May 14, 2018 to May 14, 2020.

Adjunct Appointments – Instruction

JOHAL, Jasdeep, Lecturer, School of Accounting and Finance, May 1, 2018 to August 31, 2018.

KIEPER, Anna, Lecturer, Department of Germanic and Slavic Studies, September 1, 2018 to April 30, 2019.

Adjunct Reappointments – Instruction

ASKES, Andrew, Lecturer, Department of Drama and Speech Communication, May 1, 2018 to August 31, 2018.

BRIGGS, Catherine, Lecturer, Department of History, May 1, 2018 to August 31, 2018.

BULLOCH, Dean, Lecturer, Department of Psychology, May 1, 2018 to August 31, 2018.

DE ROOIJ-MOHLE, Margreet, Lecturer, Department of Germanic and Slavic Studies, May 1, 2018 to August 31, 2018.

EVANS, Natalie, Lecturer, Department of Philosophy, May 1, 2018 to August 31, 2018.

GERNON, Mark, Lecturer, Department of Psychology, May 1, 2018 to August 31, 2018.

HAYDON, Nathan, Lecturer, Department of Philosophy, May 1, 2018 to August 31, 2018.

HAYES, Nicole, Lecturer, Department of Anthropology, May 1, 2018 to August 31, 2018.

HILL, Heather, Lecturer, Department of Drama and Speech Communication, May 1, 2018 to August 31, 2018.

HUTCHISON, Jesse, Lecturer, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

LESIUK, Michael, Lecturer, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

MCDERMOTT, Neil, Lecturer, Department of Psychology, May 1, 2018 to August 31, 2018.

MCGEE, Ted, Professor, (Professor Emeritus), Department of English Language and Literature, May 1, 2018 to August 31, 2018.

OLDHAM, Andrew, Lecturer, School of Accounting and Finance, May 1, 2018 to August 31, 2018.

PECKHAM, William, Lecturer, Department of Psychology, May 1, 2018 to August 31, 2018.

RAHMAN, Fiona, Lecturer, Department of Economics, May 1, 2018 to August 31, 2018.

RAY, Nicholas, Lecturer, Department of Philosophy, May 1, 2018 to August 31, 2018.

RUFFUDEEN, Zamal, Lecturer, School of Accounting and Finance, May 1, 2018 to August 31, 2018.

SABZIAN, Saeed, Lecturer, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

SHAKESPEARE, Robert, Lecturer, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

SOLEIMANI DAHAJ, Arash, Lecturer, Department of Economics, May 1, 2018 to August 31, 2018.

STETTNER, Shannon, Lecturer, Department of Philosophy, May 1, 2018 to August 31, 2018.

WARRINER, Keith, Associate Professor, (Associate Professor Emeritus), Department of Sociology and Legal Studies, May 1, 2018 to August 31, 2018.

WEAVER, Sara, Lecturer, Department of Philosophy, May 1, 2018 to August 31, 2018.

XIANG, Will, Lecturer, School of Accounting and Finance, May 1, 2018 to August 31, 2018.

Adjunct Reappointments – Miscellaneous (research, consultations, etc.)
PHILLIPS, Marjorie, Clinical Supervision, Department of Psychology, May 1, 2018 to April 30, 2019.

Adjunct Reappointments – Graduate Supervision
MCARTHUR, Murray, Professor, (Professor Emeritus), Department of English Language and Literature, May 1, 2018 to April 30, 2023.

Graduate Students Appointed as Part-Time Lecturers
BERIAULT, Phillip, Department of Philosophy, May 1, 2018 to August 31, 2018.

BREY, Elizabeth, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

COOK, Katie, Department of Philosophy, May 1, 2018 to August 31, 2018.

DEVRIES, Sandra, Department of Philosophy, May 1, 2018 to August 31, 2018.

FAST, William, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

FREIER, Blake, Department of Philosophy, May 1, 2018 to August 31, 2018.

JORDAN, William, Department of Philosophy, May 1, 2018 to August 31, 2018.

LAM, Vanessa, Department of Philosophy, May 1, 2018 to August 31, 2018.

MACDONALD, Ian, Department of Philosophy, May 1, 2018 to August 31, 2018.

NICKERSON-WHITE, Sara Jane, Department of Sociology and Legal Studies, May 1, 2018 to August 31, 2018.

RILEY, Meghan, Department of English Language and Literature, May 1, 2018 to August 31, 2018.

SYCZ, Damian, Department of Sociology and Legal Studies, May 1, 2018 to August 31, 2018.

WASS, Chris, Department of Philosophy, May 1, 2018 to August 31, 2018.

Staff Appointments to Faculty
CAMPBELL, Greg, Lecturer, Department of Drama and Speech Communication, May 1, 2018 to August 31, 2018.

DI GRAVIO, Katrina, Lecturer, Department of Psychology, May 1, 2018 to August 31, 2018.

RAINVILLE, Janelle, Lecturer, Department of Drama and Speech Communication, May 1, 2018 to August 31, 2018.

B. ADMINISTRATIVE APPOINTMENTS

COOPER, Tara, Associate Chair, Graduate Studies, Department of Fine Arts, July 1, 2018 to June 30, 2020.

DUSAILLANT-FERNANDES, Valerie, Associate Chair, Undergraduate Studies, Department of French Studies, January 1, 2019 to June 30, 2019.

ESSELMENT, Anna, Associate Chair, Undergraduate Studies, Department of Political Science, July 1, 2018 to June 30, 2019.

FAULKNER, Andrew, Chair, Department of Classical Studies, July 1, 2019 to June 30, 2022.

FEHR, Carla, Associate Chair, Graduate Studies, Department of Philosophy, July 1, 2018 to June 30, 2021.

FRASER, Doreen, Associate Chair, Undergraduate Studies, Department of Philosophy, July 1, 2018 to June 30, 2021.

FUGELSANG, Jonathan, Associate Chair, Graduate Studies, Department of Psychology, July 1, 2018 to June 30, 2020.

HOUSTON, Andrew, Associate Chair, Undergraduate Studies (Drama), Department of Drama and Speech Communication, July 1, 2018 to June 30, 2020.

LIU, Jennifer, Associate Chair, Graduate Studies, Department of Anthropology, July 1, 2018 to June 30, 2021.

MACDONALD, Shana, Associate Chair, Undergraduate Studies (Speech Communication), Department of Drama and Speech Communication, July 1, 2018 to June 30, 2021.

MACFARLANE, Emmett, Associate Chair, Graduate Studies, Department of Political Science, July 1, 2018 to June 30, 2021.

NILSEN, Elizabeth, Interim Associate Dean, Graduate Studies, July 1, 2018 to December 31, 2018.

PACI, Timothy, Associate Chair, University Communication Outcomes Initiative (UCOI), Department of Drama and Speech Communication, July 1, 2018 to June 30, 2020.

XU, Dinghai, Associate Chair, Graduate Studies, Department of Economics, September 1, 2018 to June 30, 2020.

VESTER, Christina, Interim Chair, Department of Classical Studies, July 1, 2018 to June 30, 2019.

WATTS, Christopher, Associate Chair, Undergraduate Studies, Department of Anthropology, July 1, 2018 to June 30, 2021.

<u>Administrative Reappointment</u>

COLLINGTON, Tara, Associate Chair, Undergraduate Studies, Department of French Studies, July 1, 2018 to December 31, 2018.

CURRY, Phil, Associate Chair, Graduate Studies, Department of Economics, July 1, 2018 to August 31, 2018.

EIBACH, Richard, Associate Chair, Undergraduate Studies, Department of Psychology, July 1, 2018 to June 30, 2020.

LEPAGE, ÉLISE, Associate Chair, Graduate Studies, Department of French Studies, July 1, 2018 to June 30, 2019.

VIDEKANIC, Bojana, Associate Chair, Undergraduate Studies, Department of Fine Arts, July 1, 2018 to June 30, 2020.

CANCELLATIONS
LLUIS, Stéphanie, Associate Chair, Graduate Studies, Department of Economics, July 1, 2018 to June 30, 2020.

CHANGE in DATES
AGER, Sheila, Interim Chair, Department of Fine Arts, **from** November 22, 2017 to June 30, 2018 **to** November 22, 2017 to December 31, 2018.

FAULKNER, Andrew, Chair, Department of Classical Studies, **from** July 1, 2017 to June 30, 2021 **to** July 1, 2017 to June 30, 2018.

HOEPPE, Götz, Associate Chair, Undergraduate Studies, Department of Anthropology, **from** July 1, 2016 to June 30, 2019 **to** July 1, 2016 to June 30, 2018.

C. SABBATICAL LEAVES
For approval by the Board of Governors:
BETZ, Emma, Associate Professor, Department of Germanic and Slavic Studies, six months from January 1, 2019 to June 30, 2018, at 85% salary.

Douglas M. Peers
Dean, Faculty of Arts

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF ENGINEERING TO SENATE
June 18, 2018

For information:

A. APPOINTMENTS

Probationary Term Appointments

SCHNEIDER, Oliver, Assistant Professor, Department of Management Sciences, August 1, 2018 – June 30, 2021. PhD University of British Columbia 2016; MSc University of British Columbia 2012; BSc University of Saskatchewan 2010. Oliver Schneider has research and teaching interests in Human Computer Interaction and Haptics.

New Definite Term Appointments – full-time

AHMADI, Lena, Lecturer, Department of Chemical Engineering, May 1, 2018 – April 29, 2020. PhD University of Waterloo 2014; MSc University of Manchester, UK and K.N. Toosi University of Technology, Iran 2008; BSc University of Mazandaran, Iran, 2004. Dr. Lena Ahmadi brings strong experience in teaching a broad range of courses relevant to the Chemical Engineering program, as well as a passion and extraordinary enthusiasm toward teaching, which undoubtedly will be much appreciated by our undergraduate students.

HASHEMI, Eshan, Research Assistant Professor, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – April 30, 2021. PhD University of Waterloo 2017; MASc AmirKabir University of Technology (Tehran Polytechnic), Tehran, Iran 2005; BASc Iran University of Science and Technology, Tehran, Iran 2002. Dr. Ehsan Hashemi joins the department in the area of vehicle dynamics and control. He has been a Postdoctoral Fellow with Prof. Amir Khajepour since June 2017, and this new position expands our vehicle dynamics and autonomous driving initiative.

HOWCROFT, Jennifer, Lecturer, Department of Systems Design Engineering, July 1, 2018 – June 30, 2021. PhD University of Waterloo, 2016; MSc University of Toronto 2011; BSc University of Guelph 2009. Dr. Howcroft has a passion for excellence in teaching, with a strong background in the pedagogy of design, where Systems Design currently has teaching needs. Her research interests are in the biomedical /biomechanics / human factors area, which dovetails very well with our specializations in the Biomedical Engineering program.

ZHAO, Pei, Research Assistant Professor, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – April 30, 2020. PhD Technical Institute of Physics and Chemistry, Beijing, China 2014; BASc Tongji University, Shanghai, China 2009. Dr. Pei Zhao joins the department in the area of microfluidics. She has been a Postdoctoral Fellow with Prof. Carolyn Ren since July 2015, and this new position increases our microfluidics and nano materials research capabilities.

Definite Term Reappointments – full-time

NORMANI, Stefano, Research Assistant Professor, Department of Civil & Environmental Engineering, May 1, 2018 – May 31, 2018.

PIRNIA, Mehrdad, Lecturer, Department of Management Sciences, July 1, 2018 – June 30, 2021.

SANGARY, Nagula, Research Associate Professor, Department of Electrical & Computer Engineering, May 1, 2018 – July 31, 2018.

Visiting Appointments

DAS, Gulesin Sena, Researcher, Department of Management Sciences, July 1, 2018 – June 30, 2019.

JAHANIAN NAJAFABADI, Ali, Associate Professor, Department of Chemical Engineering, September 1, 2018 – August 31, 2019.

KAZEMI, Nasser, Professor, Department of Chemical Engineering, July 1, 2018 – June 30, 2019.

KONG, Zhe, Scholar, Department of Electrical & Computer Engineering, July 1, 2018 – June 30, 2019.

LI, Jinhua, Associate Professor, Department of Chemical Engineering, August 15, 2018 – February 14, 2019.

LI, Yan, Researcher, Department of Electrical & Computer Engineering, May 1, 2018 – April 30, 2019.

MANDAL, Arpita, Researcher, Department of Civil & Environmental Engineering, April 1, 2018 – August 31, 2018.

MATTHEW, Martz, Scholar, Department of Chemical Engineering, May 1, 2018 – August 31, 2018.

QIN, Yiheng, Researcher, Department of Electrical & Computer Engineering, May 20, 2018 – May 19, 2019.

SADEGHIMAKKI, Bahareh, Scientist, Department of Electrical & Computer Engineering, March 1, 2018 – February 29, 2020.

SUN, Bai, Scholar, Department of Mechanical & Mechatronics Engineering, September 1, 2018 – August 31, 2019.

TAYLOR, Chris, Scholar, Department of Chemical Engineering, May 1, 2018 – August 31, 2018.

VANIN DOS SANTOS LIMA, Mirela, Professor, Department of Chemical, July 13, 2018 – July 31, 2019.

Visiting Reappointments

ZAMANI SIBONI, Hossein, Scholar, Department of Electrical & Computer Engineering, May 1, 2018 – April 30, 2019.

Special Appointments – Undergraduate Instruction

BELLINI, Christian, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

BISSETT, Tara, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

BYSKAL, Daniel, Lecturer, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – August 31, 2018.

CHRISTIAN, Beverley, Lecturer, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – August 31, 2018.

COOPER-STACHOWSKY, Michael, Lecturer, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – August 31, 2018.

DEHART, Brandon, Lecturer, Department of Electrical & Computer Engineering, May 1, 2018 – August 31, 2018.

ESPOSITO, Jennifer, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

FARD, Ali, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

FERNANDEZ RINCON, Virginia, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

GALPIN, Paul, Lecturer, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – August 31, 2018.

GOMES, Adam, Lecturer, Department of Electrical & Computer Engineering, May 1, 2018 – August 31, 2018.

HADWIN, Paul, Lecturer, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – August 31, 2018.

KOLLER, Heinz, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

LIM TUNG, Fiona, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

SORLI, Scott, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

SWAIN, James, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

VANGJELI, Sonja, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

ZURELL, Cory, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

Special Appointments – Graduate Instruction

BETTIO, Walter, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

ENGLAND, Craig, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

FONSEKA, Jaliya, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

LEVITT, Janna, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

SCOTT, Tim, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

Special Reappointments – Undergraduate Instruction

ATKINS, Andrea, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

DOWLING, Paul, Lecturer, School of Architecture, May 1, 2018 – August 31, 2018.

MATHER, David, Lecturer, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – August 31, 2018.

Adjunct Appointments – Graduate Supervision

XU, Wilsun, Professor, Department of Electrical & Computer Engineering, May 1, 2018-April 30, 2021.

Adjunct Appointments – Graduate Supervision and Research

DAIN, Steven, Associate Professor, Department of Systems Design Engineering, February 1, 2018 – January 31, 2021.

HENDERSON, Vimy, Assistant Professor, Department of Civil & Environmental Engineering, April 1, 2018 – March 30, 2020.

JIN, Chao, Assistant Professor, Department of Systems Design Engineering, April 1, 2018 – March 31, 2021.

ROUHANI, Hossein, Assistant Professor, Department of Mechanical & Mechatronics Engineering, May 1, 2018 – April 30, 2021.

Adjunct Reappointments – Research & Graduate Supervision

CHUNG, Duane, Assistant Professor, Department of Chemical Engineering, May 1, 2017 – April 30, 2020.

HABERKAMP, Jens, Professor, Department of Civil & Environmental Engineering, May 1, 2018 – April 30, 2020.

LIN, Xiaodong, Associate Professor, Department of Electrical & Computer Engineering, April 1, 2018 – March 31, 2021.

SHAKER,George, Assistant Professor, Department of Electrical & Computer Engineering, November 1, 2017 – October 31, 2020.

SOLIMAN, Mostafa, Assistant Professor, Department of Systems Design Engineering, March 1, 2018 – February 28, 2021.

Adjunct Reappointments – Undergraduate Instruction

NASSER, Mohammed, Lecturer, Department of Electrical & Computer Engineering, May 1, 2018 – April 30, 2019.

ZARNETT, Jeffrey, Lecturer, Department of Electrical & Computer Engineering, May 1, 2018 – April 30, 2019.

Cross Reappointments

TAN, Zhongchao, Associate Professor, Department of Mechanical & Mechatronics Engineering to Department of Chemical Engineering, October 20, 2017 – October 19, 2020.

Changes in Appointments

GIANNIKOURIS, Allyson, Definite Term Lecturer, transferring from the Department of Electrical & Computer Engineering to the Department of Mechanical & Mechatronics Engineering, May 1, 2018.

B. ***ADMINISTRATIVE APPOINTMENTS***

OPAL, Ajoy, Professor, Department of Electrical & Computer Engineering, Associate Dean, Teaching, September 1, 2018 – August 31, 2020.

ADMINISTRATIVE REAPPOINTMENTS

FIEGUTH, Paul, Professor, Chair, Department of Systems Design Engineering, September 1, 2018 – August 31, 2020.

MORESOLI, Christine, Professor, Department of Chemical Engineering, Associate Dean, Co-operative Education & Professional Affairs, September 1, 2018 – August 31, 2021.

C. ***SABBATICAL***

For Approval by the Board of Governors

BLACKWELL, Adrian, Assistant Professor, School of Architecture, September 1, 2018 – August 31, 2019, twelve months at 85% salary.

JIANG, Ning, Assistant Professor, Department of Systems Design Engineering, January 1, 2019 – June 30, 2019, six months at 100% salary.

TRIPP, Bryan, Associate Professor, Department of Systems Design Engineering, January 1, 2019 – June 30, 2019, six months at 85% salary.

ZHU, Kejia, Assistant Professor, Department of Management Sciences, September 1, 2018 – February 28, 2019, six months at 100% salary.

ONAY, Selcuk, Associate Professor, Department of Management Sciences, September 1, 2018 – August 31, 2019, twelve months at 96.8% salary.

SCOTT, Andrea, Assistant Professor, Department of Systems Design Engineering, January 1, 2019 – December 31, 2019, twelve months at 85% salary.

STASHUK, Daniel, Professor, Department of Systems Design Engineering, September 1, 2018 – August 31, 2019, twelve months at 85% salary.

Approved by the Board of Governors
STUBLEY, Gordon, Professor, Department of Mechanical & Mechatronics Engineering, January 1, 2019 – December 31, 2019, twelve months at 100% salary.

Pearl Sullivan
Dean, Faculty of Engineering

University of Waterloo
REPORT OF THE DEAN OF ENVIRONMENT TO SENATE
June 18, 2018

FOR INFORMATION

A. APPOINTMENTS

Definite Term Appointment – part-time
CORDONIER SEGGER, Marie-Claire, Professor, School of Environment, Enterprise and Development [SEED], January 1, 2019 to December 31, 2022.

Adjunct Appointments
Graduate Supervision
MASON, Sherri, Professor, School of Environment, Resources and Sustainability, May 1, 2018 to October 31, 2018.

WINFIELD, Mark, Professor, School of Planning, April 1, 2018 to March 31, 2019.

Graduate Supervision and Research
LeDREW, Ellsworth [Professor Emeritus]**,** Professor, Department of Geography and Environmental Management, September 1, 2018 to August 31, 2022.

B. ADMINISTRATIVE APPOINTMENT

WOOD, Michael, Associate Director, Undergraduate Studies, School of Environment, Enterprise and Development, July 1, 2018 to June 30, 2021.

ADMINISTRATIVE REAPPOINTMENT
GORBET, Rob, Chair, Department of Knowledge Integration, September 1, 2018 to August 31, 2020.

C. RETIREMENT

LeDREW, Ellsworth, Professor, Department of Geography and Environmental Management, September 1, 2018.

D. SABBATICALS

For Approval by the Board of Governors
ELLIOTT, Susan, Professor, Department of Geography and Environmental Management, January 1, 2019 to June 30, 2019, at 85% salary.

GIBSON, Robert, Professor, School of Environment, Resources and Sustainability, January 1, 2019 to June 30, 2019, at 85% salary.

LAW, Jane, Associate Professor, School of Planning and School of Public Health and Health Systems, September 1, 2018 to February 28, 2019, at 85% salary.

Jean Andrey
Dean

University of Waterloo
REPORT OF THE DEAN OF MATHEMATICS TO SENATE
June 18, 2018

FOR INFORMATION

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

Probationary-Term Appointments

FOUNTOULAKIS, Kimon (Diploma in Management Science and Technology, 2009, Athens University of Economics and Business; MSc, 2010; PhD, 2015, both from the University of Edinburgh), Assistant Professor, David R. Cheriton School of Computer Science, July 1, 2018 – June 30, 2021. Kimon Fountoulakis completed his PhD in Optimization at the University of Edinburgh, Scotland, followed by a postdoctoral fellowship at the University of California at Berkeley and the International Computer Science Institute (ICSI) at Berkeley. His recent research focuses on large-scale optimization and its application to local graph clustering. He has also worked on parallelizing optimization and local graph clustering algorithms, as well as higher-order optimization methods for machine learning and signal processing problems.

GAO, Pu (BSc, 2005, Nanjing University; MMath, 2006; PhD, 2010, both from the University of Waterloo), Assistant Professor, Dept. of Combinatorics and Optimization, January 1, 2019 – June 30, 2022. After completing her PhD, Dr. Gao was awarded Humboldt and NSERC Postdoctoral Fellowships, and spent these at the Max-Planck Institute for Computer Science and the University of Toronto, respectively. Since 2015, Dr. Gao has been a Lecturer at the School of Mathematical Sciences of Monash University, Australia. Dr. Gao's is a leader in the field of Random Graphs and Structures, and their applications. Her influential work in this area appears in the field's top journals and conferences. Random graphs and structures form an important component of Combinatorics & Optimization, and Dr. Gao therefore complements the existing strength of the department well.

YANG, Fan (BS, 2008, Xi’an Jiaotong University; MS, 2010; PhD, 2013, both from the University of Iowa), Assistant Professor, Dept. of Statistics and Actuarial Science, July 1, 2018 – June 30, 2021. Fan Yang is currently a research assistant professor in the Department of Statistics and Actuarial Science at the University of Waterloo. She received a PhD in Applied Mathematical and Computational Science from the University of Iowa in 2013. Her research interests include actuarial science, applied probability and finance. More specifically, she works in areas such as the analysis of risk measures, tail dependence, diversification and approaches to mitigate extreme risk. With her research expertise, Fan will help bridge the divide between our existing researchers in actuarial science and finance.

GOSSET, David (BSc, 2006, University of British Columbia; PhD, 2011, Massachusetts Institute of Technology), Associate Professor, Dept. of Combinatorics and Optimization, August 1, 2018 – June 30, 2021. Dr. Gosset is currently a Research Staff Member in the Theory of Quantum Computing and Information group at IBM T.J. Watson Research Center, Yorktown Heights, NY. Dr. Gosset's research focuses on quantum algorithms and complexity theory, and on the study of quantum many-body systems. Among his main results are: a novel architecture for a quantum computer, frustration-freeness of local Hamiltonians, the spectral gap of one-dimensional qubit chains, and the power of constant depth quantum circuits. Each of these results exhibits considerable creativity and technical prowess, and is highly regarded by the Quantum Information community. Dr. Gosset's research strengths supplement the existing strength of the C&O department in this area well.

Definite Term - Appointments
SLYNKO, Alla (Magister, 1999, Odessa State Marine University; Diploma, 2006, Berlin University of Technology; PhD, 2010, University of Mannheim), Research Assistant Professor, Dept. of Statistics and Actuarial Science, October 1, 2018 – September 30, 2021.

Definite Term - Reappointments
WOODY, Owen, Lecturer, Office of the Dean, August 31, 2018 – August 30, 2019.

Visiting Appointments
LIU, Donghai (Hunan University of Science & Technology), Researcher, Dept. of Statistics and Actuarial Science, September 1, 2018 – August 31, 2019.

Adjunct Appointments
Instructor
BROGLY, Chris, Lecturer, David R. Cheriton School of Computer Science, May 1, 2018 – August 31, 2018.

Adjunct Reappointments
Instructor
GALBRAITH, John, Lecturer, Office of the Dean, September 1, 2018 – August 31, 2020.

KHARAL, Rosina, Lecturer, David R. Cheriton School of Computer Science, September 1, 2018 – December 31, 2018.

Research
NEWCOMBE, Patricia, Professor Emeritus, Dept. of Statistics and Actuarial Science, October 1, 2018 – September 30, 2021.

Graduate Students appointed as Part-time Lecturers
HARMS, Nathaniel, David R. Cheriton School of Computer Science, May 1, 2018 – August 31, 2018.

Van BOMMEL, Christopher, Dept. of Combinatorics and Optimization, May 1, 2018 – August 31, 2018.

Graduate Students reappointed as Part-time Lecturers
TONDELLO, Gustavo Fortes, David R. Cheriton School of Computer Science, May 1, 2018 – August 31, 2018.

Postdoctoral Fellows appointed as Part-time Lecturers
CRAWFORD, Simon, Dept. of Pure Mathematics, September 1, 2018 – August 31, 2020.

SALOMON, Guy, Dept. of Pure Mathematics, November 1, 2018 – October 31, 2020.

B. ADMINISTRATIVE APPOINTMENTS

van BEEK, Peter, Associate Director, David R. Cheriton School of Computer Science, July 1, 2018 – June 30, 2020.

WEDDELL, Grant, Associate Director, Undergraduate Studies, David R. Cheriton School of Computer Science, September 1, 2018 – August 31, 2020.

ADMINISTRATIVE REAPPOINTMENTS
KARSTEN, Martin, Director, Infrastructure, David R. Cheriton School of Computer Science, March 1, 2019 – June 30, 2020.

SALEM, Ken, Director, Infrastructure, David R. Cheriton School of Computer Science, September 1, 2018 – February 28, 2019.

B.1 Change
FURINO, Steve, Assistant Director, On-Line Instruction, Office of the Dean (*ref.* Deans Report to Senate, June 2017)
From: July 1, 2017 – June 30, 2018
To: July 1, 2017 – June 30, 2020

KARSTEN, Martin, Director, Infrastructure, David R. Cheriton School of Computer Science (*ref.* Deans Report to Senate, September 2017)
From: July 1, 2017 – June 30, 2020
To: July 1, 2017 – August 31, 2018

C. **SABBATICALS** (for approval by the Board of Governors)
KEMPF, Achim (Professor), Dept. of Applied Mathematics, November 1, 2018 – April 30, 2019 at 100% salary.

Stephen M. Watt
Dean

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF SCIENCE TO SENATE
June 18, 2018

For information:

A. *APPOINTMENTS*

New Definite Term

McCANNA, David J., Research Assistant Professor, School of Optometry and Vision Science, May 15, 2018 to May 14, 2020. [B.Sc., Syracuse University (1988); M.A., SUNY Geneseo (1990); Ph.D. University of Waterloo (2009).] David McCanna was a Research Associate within the Centre for Ocular Research & Education (CORE). He is the former Head of Microbiology & Toxicology at Bausch & Lomb in Rochester, New York and completed a PhD at the School of Optometry & Vision Science on novel ocular toxicology methods. Dr McCanna runs CORE's microbiology and toxicology program and interfaces with external sponsors to investigate the development of novel dry eye and contact lens care products and develop novel methods to look at their interaction with the ocular surface. His new appointment as a research assistant professor within the School of Optometry and Vision Science (SOVS) supports SOVS role of supporting continued growth and development of CORE in its mission to improve global eye health and vision through advanced bioscience, clinical research and education

Adjunct Appointments

Graduate Supervision

MOLNAR, Sheri, Assistant Professor, Department of Earth and Environmental Sciences, April 1, 2018 to March 31, 2021.

Undergraduate Instruction and Research

FINDLATER, Carla, Assistant Professor, School of Pharmacy, June 1, 2018 to May 31, 2021.

IABONI, Dolores, Assistant Professor, School of Pharmacy, June 1, 2018 to May 31, 2021.

Graduate Supervision and Research

LUM, Edward, Assistant Professor, School of Optometry and Vision Science, May 1, 2018 to April 30, 2021.

RAAHEMIFAR, Kaamran, Professor, School of Optometry and Vision Science, June 1, 2018 to May 31, 2021.

Adjunct Reappointments

Graduate Supervision

JACKSON, Richard E., Professor, Department of Earth and Environmental Sciences, April 1, 2018 to March 31, 2021.

Research

JELLIE, Hugh, Associate Professor, School of Optometry and Vision Science, June 1, 2018 to May 31, 2021.

Graduate Instruction and Graduate Supervision

ZENG, Bei, Professor, Department of Physics and Astronomy, January 1, 2018 to August 31, 2024.

Cross Reappointments

WALLMAN, Joel, Research Assistant Professor, Department of Applied Mathematics, cross appointed to Department of Physics and Astronomy, March 1, 2018 to February 28, 2021.

Special Appointments

WIEBE, Andrew J., Lecturer, Department of Earth and Environmental Sciences, May 1, 2018 to August 31, 2018.

Special Reappointment

DURR, Hans, Lecturer, Department of Earth and Environmental Sciences, May 1, 2018 to July 31, 2018.

PFISTERER, Steve, Lecturer, Department of Physics and Astronomy, September 1, 2018 to December 31, 2018.

ROSAMOND, Madeline, Lecturer, Department of Earth and Environmental Sciences, May 1, 2018 to August 31, 2018.

B. FOR APPROVAL BY THE BOARD OF GOVERNORS

SABBATICAL

CHOI, Kyung-Soo, Assistant Professor, Department of Physics and Astronomy, special early leave, September 1, 2018 to Feburary 28, 2019, 100% salary arrangements.

RP. Lemieux
Dean

RPL:lw

University of Waterloo
SENATE
Report to Senate
18 June 2018

FOR APPROVAL

Committee Appointments
Motion: To approve the following appointments:

- **Senate Undergraduate Council:** Bruce MacVicar (civil and environmental engineering) as the Engineering faculty representative, term 1 May 2018 to 30 April 2020.

- **Senate Nominating Committee for Honorary Degrees:** John Haddock as the alumni member of Senate, term 1 May 2018 to 30 April 2019.

University of Waterloo
SENATE
Report of the Vice-President Academic & Provost
June 18, 2018

FOR INFORMATION

University Research Chairs
The 2018 University Research Chairs: **James Blight** (history); **Raouf Boutaba** (computer science); **Thomas Homer-Dixon** (faculty of environment); **Imre Szeman** (drama and speech communication); **Ruodo Wang** (statistics and actuarial science); **Olaf Weber** (environment, enterprise and development); **David Welch** (political science).

Waterloo has granted 74 University Research Chair awards since 2004. Current chair holders are: **Guang Gong** (electrical and computer engineering), **Alice Kuzniar** (germanic and slavic studies), **Juewen Liu** (chemistry), **Colleen Maxwell** (pharmacy), **Marcel O'Gorman** (english language and literature), **Graham Taylor** (systems design engineering), **Zhou Wang** (electrical and computer engineering) in 2017; **Jeff Chen** (physics & astronomy), **Duane Cronin** (mechanical & mechatronics engineering), **Xianshe Feng** (chemical engineering) in 2016; **Pu Chen** (chemical engineering), **Claude Duguay** (geography & environmental management), **Lila Kari** (computer science), **Debbie Leung** (combinatorics & optimization), **John Long** (electrical and computer engineering), **Brian McNamara** (physics & astronomy), **Heidi Swanson** (biology) in 2015; **James Geelen** (combinatorics & optimization), **Achim Kempf** (applied mathematics), **Xianguo Li** (mechanical & mechatronics engineering), **Qing-Bin Lu** (physics & astronomy), **Mark Matsen** (chemical engineering), **Daniel Scott** (geography & environmental management) in 2014; **Chris Bauch** (applied mathematics), **Jason Bell** (pure mathematics), **Ravi Mazumdar** (electrical & computer engineering) in 2013; **Ian Goldberg** (computer science), **Elizabeth Irving** (optometry & vision science), **Shesha Jayaram** (electrical & computer engineering), **Lyndon Jones** (optometry & vision science), **Michele Mosca** (combinatorics & optimization) in 2012; **Fakhreddine Karray** (electrical & computer engineering), **Bill McIlroy** (kinesiology), **Sivabal Sivaloganathan** (applied mathematics), **Michael Tam** (chemical engineering), **Grace Yi** (statistics & actuarial science) in 2011.

UNIVERSITY RESEARCH CHAIRS
University of Waterloo owes much of its reputation and stature to the quality of its professors and their scholarly accomplishments. University of Waterloo recognizes exceptional achievement and pre-eminence in a particular field of knowledge through the designation 'University Research Chair' - a title which may be held for up to seven years, with the possibility of a re-nomination. A faculty member with this title will receive either a teaching reduction of one course per year or an annual stipend of $10,000, which will be allocated to the Department/School if teaching reduction is chosen. The University Research Chair title and benefits will be relinquished if a Canada Research Chair or other major research chair is awarded.

It is anticipated that there will be a limited number of University Research Chairs; at steady state, the intention is to make at most five appointments each year. The number of appointments will be reviewed annually by the Vice-President Academic & Provost in consultation with Deans' Council and the program will be reviewed after an initial period of five to ten years.

D. George Dixon
Interim Vice-President Academic & Provost

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
Report to Senate
18 June 2018

Senate Graduate & Research Council met on 14 May 2018 and agreed to forward the following items 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

NEW UNIVERSITY RESEARCH CENTRE

Interdisciplinary Centre of Climate Change (IC^3)

1. **Motion:** To approve the Interdisciplinary Centre on Climate Change (IC^3) transitioning from a Research Centre (as established 1 June 2008) to a University Research Centre, as presented in Attachment 1.

   Rationale: The transition to a University-funded Research Centre would enable IC3 to expand its activities in targeted areas so as to solidify its status as a nationally-leading Centre, including:
   - **Strengthened Domestic and International Partnerships:** Leverage the many new partnerships established during its leadership of the Networks of Centres of Excellence proposal to strengthen relationships with Canadian governments, professional and industry associations, boundary organizations, as well as internationally-leading centres and networks (including the newly established Global Centre of Excellence for Climate Adaptation in the Netherlands); Support IC3 member engagement and leadership within the IPCC and other international research networks.
   - **Enhanced Research Support:** Enhance the pilot seed grant program to foster member networking and advance research proposal development to increase success with Granting Councils, government and other external funding; Chair the Standing Research Committee of Canada's Climate Change Adaptation Platform to catalyze research partnerships between its members (which include 10 federal departments, all provincial and territorial governments, three national Indigenous organizations, and representatives of national municipal, industry, business and professional organizations) and Canada's research community.
   - **Creation of an On-Campus Climate Collaboration Space:** Collaboration space was highlighted as a key function of Centres/Institutes and interdisciplinary programs by the Waterloo Committee on Senate-Approved Centres and Institutes in 2011. The opening of the net-positive energy Evolv1 building in the David Johnston Research & Technology Park represents a unique opportunity for IC3, its subcentres (ICCA and CCIN/PDC), and the MCC program to co-locate, together with other Centres/Institutes (e.g., Waterloo Institute for Sustainable Energy) and private sector and non-profit organizations with strongly aligned research and knowledge mobilization interests (e.g., Sustainable Waterloo Region). The potential synergies offered by this cluster are tremendous.
   - **Strengthened Knowledge Mobilization and Communications Capacity:** Hire a dedicated knowledge mobilization specialist to assist members to communicate successes, translate research into plain language, align research with applied policy and practice needs, and raise the profile of Waterloo for climate change innovation.
   - **National and International Educational Leadership:** Contribute to the advancement of Waterloo's national and international leadership in climate change education and professional training, through targeted internships and member engagement initiatives.

NEW RESEARCH CENTRE

Waterloo Centre for Electrochemical Energy

2. **Motion:** To approve the establishment of the Waterloo Centre for Electrochemical Energy (WCEE), as presented in Attachment 2.

   Rationale: The establishment of WCEE will contribute both nationally and internationally in electrochemical energy R&D—boosting it to a higher level in terms of quality and quantity; increasing visibility of research carried out at the University of Waterloo in this domain and attracting high caliber graduate students and postdoctoral fellows to its programs. WCEE also aligns with Waterloo's strategic priorities and its Strategic Research Plan, for example Environment and Energy, Discovery and Design of Materials and Systems, Manufacturing and Devices, or Nanotechnology, with ramifications to Health and Well-Being.

PROGRAM CHANGE

Faculty of Arts

3. **Motion:** To approve 4 changes to the Master of Fine Arts (MFA) in Studio Art: Lower the minimum admission average from 80% to 75%; lower the number of references required for admission from 3 to 2 and change the type of references required from "academic" to "academic and/or professional"; update the current "Fields" (areas of research); input name change from Keith and Win Shantz Summer Internship to Keith and Win Shantz International Scholarship, as presented in Attachment 3.

   Rationale: Following a review of 20 Master of Fine Arts programs from Across Canada, the program discovered that UW Fine Arts is not in-line with some of the requirements in comparison with their competitors. As such, in order to stay competitive and avoid deterrents that might discourage applicants from choosing Waterloo, the changes as stated above were proposed, effective fall 2018.

Faculty of Mathematics

4. **Motion:** To approve a new Computer Science PhD program with a required internship and create the corresponding milestone for the internship, as presented in Attachment 4.

   Rationale: By transferring into this new PhD program with a required internship, international students will be able to obtain a work permit to do an internship in any term, subject to stated conditions, effective fall 2018.

CHANGES TO GRADUATE STUDIES REGULATIONS AND ACADEMIC CALENDAR

Graduate Studies and Postdoctoral Affairs

5. **Motion:** To approve 5 changes to Academic Calendar and Graduate Studies Regulations: drop/add deadline date, fee arrangement deadlines, graduate student class enrolment; apply for graduation; inactive status; Master's thesis regulations; PhD comprehensive examinations, as presented in Attachment 5.

/kw

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

Charmaine Dean
Vice President, University Research

Proposal to Transition the Interdisciplinary Centre on Climate Change (IC³) to a University-Funded Research Centre

Interdisciplinary Centre on Climate Change IC³

Prepared for Senate and Graduate Research Council
March 2018

UNIVERSITY OF WATERLOO

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Executive Summary

'CHANGE MATTERS' …
IC3 brings together experts across disciplines to consider the impacts of climate change from every angle. A fresh approach, built on smart science, working toward achievable solutions – because at Waterloo, change really does matter.

The University of Waterloo has a long-standing reputation of anticipating society's needs and responding effectively as major challenges emerge. The increasing salience of climate change as a grand challenge for the 21st century was the central motivation for establishing the Interdisciplinary Centre on Climate Change (IC3) in 2008. Building on 25 years of climate change research and education on campus, IC3's genesis was part of Waterloo's new emphasis on promoting interdisciplinary, cross-Faculty research and teaching through Centres and Institutes. The need to work outside of disciplinary and sectoral silos is a recognized imperative for climate change, as its very nature and impact are truly interdisciplinary in scope, transcending geographical, geopolitical and disciplinary boundaries.

When IC3 was established there were no other climate change research centres at universities in Ontario. Ten years later, the field of climate change research and education has changed substantially and IC3 has achieved considerable success toward its original objectives with the modest financial resources and personnel it has had available. To generate broad academic value for its members and the University, IC3 focuses its efforts in four core areas: (1) Network Building, (2) Research Development, (3) Knowledge Mobilization, and (4) Education and Training. IC3 has expanded its scope in recent years through the establishment in 2015 of a new Senate-approved sub-Centre, the Intact Centre on Climate Adaptation (ICCA), as well as integration with the Canadian Cyrospheric Information Network / Polar Data Catalogue (CCIN/PDC) research group in 2016.

Although much has changed with respect to climate change policy and practice since IC3 was established, the role of the education and research sectors has remained critical to successfully addressing the massive challenge of transforming the global economy, our institutions, and our communities within a generation. The need for knowledge to inform climate change mitigation and adaptation policy as well as planning and investment across business, community, provincial, national, and international levels continues to expand rapidly. This offers tremendous opportunity for the University to build on previous investments in IC3 to create a world-class climate change centre that will significantly elevate the academic value it delivers to the University and society. **To achieve this level of ambition, IC3 is seeking Senate Graduate and Research Council support to become a University-level funded Centre (investment of $280,000 annually from the Provost and $75,000 is pledged by the six Faculty Deans).**

The transition to a University-funded Research Centre would enable IC3 to expand its activities in targeted areas so as to solidify its status as a nationally-leading Centre, including:

1) **Strengthened Domestic and International Partnerships:**

   - Leverage the many new partnerships established during our leadership of the Networks of Centres of Excellence (NCE) proposal to strengthen relationships with Canadian governments, professional and industry associations, boundary organizations, as well as internationally-leading centres and networks (including the newly established Global Centre of Excellence for Climate Adaptation in the Netherlands).
   - Support IC3 member engagement and leadership within the Intergovernmental Panel on Climate Change (IPCC) and other international research networks.

2) **Enhanced Research Support:**

   - Enhance the pilot seed grant program to foster member networking and advance research proposal development to increase success with Granting Councils, government and other external funding.
   - Chair the Standing Research Committee of Canada's Climate Change Adaptation Platform to catalyze research partnerships between its members (which include 10 federal departments, all provincial and territorial governments, three national Indigenous organizations, and representatives of national municipal, industry, business and professional organizations) and Canada's research community.

3) **Creation of an On-Campus Climate Collaboration Space:**

   - Collaboration space was highlighted as a key function of Centres/Institutes and interdisciplinary programs by the Waterloo Committee on Senate-Approved Centres and Institutes in 2011. The opening of the net-positive energy Evolv1 building in the David Johnston Research & Technology Park represents a unique opportunity for IC3, affiliated activities, and the MCC program to co-locate, together with other Centres/Institutes (e.g., Waterloo Institute for Sustainable Energy) and private-sector and non-profit organizations with strongly aligned research and knowledge mobilization interests (e.g., Sustainable Waterloo Region). The potential synergies offered by this cluster are tremendous.

4) **Strengthened Knowledge Mobilization and Communications Capacity:**

- Hire a dedicated knowledge mobilization specialist to assist members to communicate successes, translate research into plain language, align research with applied policy and practice needs, and raise the profile of Waterloo for climate change innovation.

5) **National and International Educational Leadership:**

- Contribute to the advancement of Waterloo's national and international leadership in climate change education and professional training, through targeted internships and member engagement initiatives.
- Participate in the newly created Universities Network for Climate Capacity, established to support Article 11 of the Paris Climate Agreement on global capacity building.

In order for this vision to be realized, a series of changes to the governance, personnel and budget of IC3 have been proposed as a starting point for the strategic and operational work that will be subsequently led by a new Governing Committee and Executive Director, with support from two dedicated IC3 staff as well as externally-funded staff teams that comprise the Intact (sub) Centre and Canadian Cyrospheric Information Network/Polar Data Catalogue.

IC3 has made significant achievements toward its original objectives, fostering interdisciplinary research excellence on campus and off, a strong and growing record of federal collaboration, and national leadership in climate change education. Now, IC3 is poised to elevate Waterloo's impact and contribution to national leadership on climate change by supporting our greatest asset–our people– to catalyze new campus, domestic and international partnerships

SECTION 1: Why a University Research Centre?

1.1 The Societal Grand Challenge of Climate Change

Climate change is recognized globally as one of the grand challenges facing humankind in the 21st century. The United Nations Intergovernmental Panel on Climate Change (IPCC), in its 5th Assessment Report (IPCC 2014), confirmed the human influence on the climate system is unequivocal and growing with many of the observed changes in atmospheric greenhouse gas (GHG) concentrations, extreme weather, sea levels, polar ice loss, and ocean acidity since the 1950s unprecedented over decades to millennia.

Recognizing that today's climate impacts and disasters reflect those of relatively modest change in the climate system, the 2015 Paris Climate Agreement aims to limit global warming to 'well below' +2°C globally (over pre-industrial levels) to avoid setting in motion dangerous climate disruption. The window of opportunity to achieve this highly ambitious global objective is rapidly closing, with multiple recent analyses estimating the chance of limiting warming to +2°C at only 5% (Raftery et al. 2017). Even under a +2°C scenario, 18 of 37 abrupt regional changes in oceans, sea ice, snow cover, permafrost, and terrestrial biomes remain possible (Drijfhout et al. 2015). In a +2°C world, climate change in many regions of Canada would be much greater (+4°C on average) with attendant increased impacts on the country's natural environment, communities, and economy. The IPCC (2014) warns that the current GHG emission trajectory threatens "… *severe, pervasive and irreversible* impacts for people and ecosystems." The imperative to adapt to the impacts of inevitable changes in climate will increase markedly regardless of the success to reduce global GHG emissions.

As a consequence, attention on climate change has continued to advance on scientific, social, economic, and political agendas. Over the past decade, climate-related risks, including extreme weather events, and the failure of climate change mitigation and adaptation have ranked at the top of the World Economic Forum's Global Risk Report. The World Bank (2013) warns that climate change imperils much of the development gains made in the developing world over the last several decades and is already eroding the basis for sustainable development in some regions. The consequences of a changing climate are also one of the few global risks to have advanced the "Doomsday Clock" more than once. Every year, climatic events cost Canada billions of dollars, and impact the health, property and livelihoods of Canadians.

The 2016 Pan-Canadian Framework on Climate Change represents Canada's response to its commitments under the Paris Climate Agreement. It aims to reduce GHG emissions across all sectors and put a national price on carbon emissions so that the Canada remains competitive in the global low-carbon economy. Environment and Climate Change Canada's 2017 state of

emissions analysis concluded that Canada will almost certainly fail to meet its international commitment to reduce GHG emissions by 2030, with all but the best-case projection resulting in continued increase in emissions. With climate impacts increasingly visible across Canada, adaptation to reduce the social and economic burden of a changing climate and build a climate-competitive economy is an equal priority in the Pan-Canadian Framework. The Commissioner of the Environment and Sustainable Development (2017) recently emphasized that Canada is not prepared to adapt well to climate change.

The nature and impact of climate change are truly interdisciplinary in scope: climate change transcends geographical, geopolitical and disciplinary boundaries. A priority message from government, business and civil society leaders is that solutions to the complex problems associated with accelerating climate change cannot be developed in silos (Klein et al. 2017). Mitigation and adaptation solutions are inter-disciplinary, cross-jurisdictional, and multi-sectoral, and require a 'whole-of-society' approach. The education and research sector is critical to successfully addressing this massive challenge of transforming the global economy, our institutions, and our communities within a generation. The American College & University Presidents' Climate Commitment calls for higher education institutions to lead the development of new partnerships with government, business and local communities to build climate resilience and accelerate decarbonisation.

"We are the first generation to feel the impact of climate change and the last generation that can do something about it."

- Barack Obama, President of the United States, 23 September 2014

Waterloo student facilitators led workshops on climate adaptation with 250 high school students at the 2014 TD Walter Bean Lecture hosted by the Faculty of Environment in partnership with IC3. (Source: Fatin Chowdhury)

1.2 Purpose and Structure of this Report

The rapidly growing need for knowledge to inform policy, planning and investment across business, community, provincial, national, and international levels offers tremendous opportunities for the University of Waterloo's Interdisciplinary Centre on Climate Change (IC3). Recognizing this potential, the IC3 team has envisioned a trajectory on which the Centre could increase its impact across the Waterloo campus community and expand leadership nationally. Following a series of discussions with faculty members, Deans, and senior administration about the vision for IC3 to become a University-funded Research Centre, IC3's Executive Director was asked to prepare this report for Senate Graduate and Research Council (SGRC) in order to formalize the request.

In this report, following a brief introduction to the rapidly evolving scientific and political context of global climate change provided, Section 2 will outline the mission and achievements of IC3 over its first 10 years as a Senate-approved Centre in the areas of network building, research development, knowledge mobilization, and education and training. Section 3 then outlines IC3's ambitions and the supporting governance and resourcing requirements, which would enable IC3 to increase Waterloo's impact and contribution to national leadership on the grand societal challenge of climate change facing our country and our world.

SECTION 2: The Evolution of IC3 (2008-2017)

2.1 Mission Statement

The mission of IC3 is to *facilitate interdisciplinary research and education that empowers business, government and civil society to respond effectively to climate change and accelerate the transition to a low-carbon and climate-resilience society*. In pursuit of this mission, IC3 will:

1. Continue to increase the University of Waterloo's profile as a highly visible Canadian leader and centre of excellence in climate change research, education and policy influence;
2. Facilitate increased interdisciplinary climate change research collaboration among University of Waterloo faculty and students as well as with other academic institutions in Canada and globally;
3. Encourage trans-disciplinary research partnerships that magnify the impact of our work and meet the needs of external stakeholders (government, business, non-governmental sectors).
4. Further develop interdisciplinary climate change education at the University of Waterloo to enhance its position as an education leader on climate change in Canada.
5. Enhance climate change literacy among the youth, the general public, and decision-makers across Canada.

2.2 History and Progress towards Founding Objectives

University of Waterloo has a long-standing reputation of anticipating society's needs and responding effectively as major challenges emerge. The increasing salience of climate change as a grand challenge for the 21st century was the central motivation for establishing IC3 in 2008. Building on 25 years of climate change research and education at the University, led by the Faculty of Environment (see Figure 1), IC3 was part of Waterloo's new emphasis on promoting interdisciplinary, cross-Faculty research and teaching through Centres and Institutes. As its name implies, IC3's vision embraced Waterloo's spirit of "stronger together" to overcome disciplinary silos to address global challenges through campus-wide collaboration.

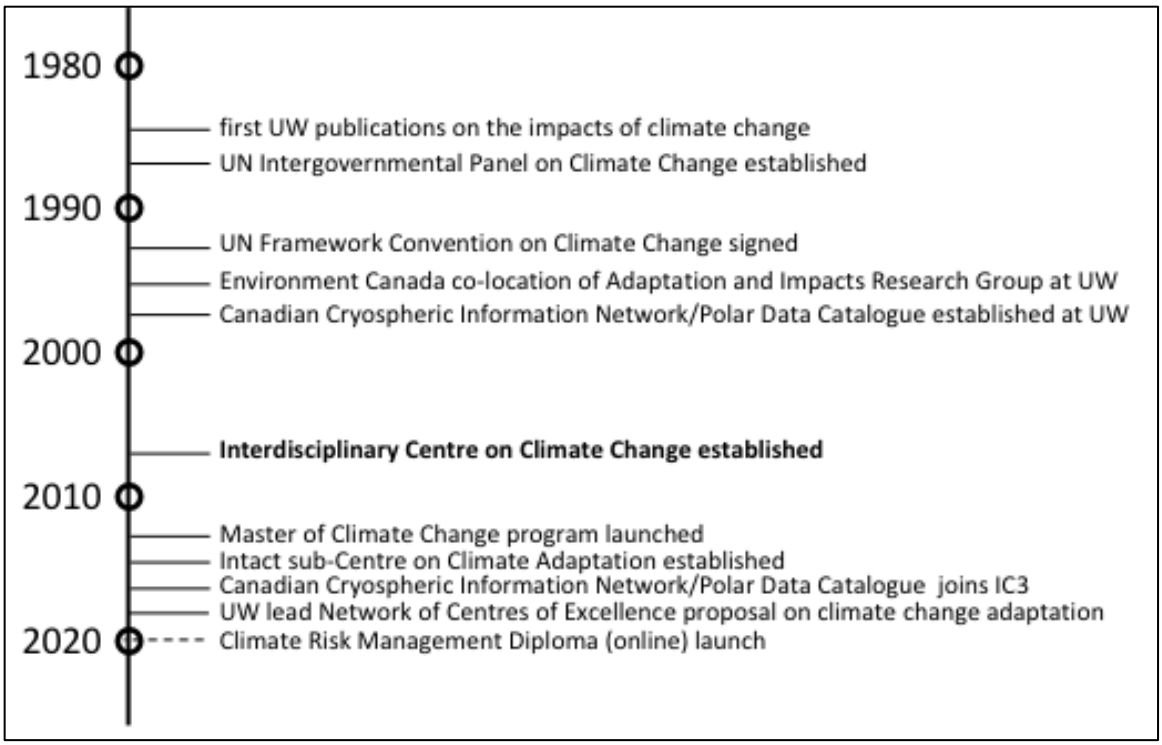

Figure 1. A Timeline of Climate Change Research and Education at the University of Waterloo

When IC3 was established there were no other climate change research centres at universities in Ontario. IC3 took a leadership position in the province, with Dr. Claude Duguay as the Director (2018-2012) and 33 founding members. In preparation for IC3's renewal application for a second five-year term, Dr. Daniel Scott was appointed as Director (2013-2018). In the time since, membership has increased to 68 members that currently represent 16 Departments and Schools across all six Faculties and affiliates at five external organizations (Wilfrid Laurier University, Centre for International Governance Innovation, Environment & Climate Change Canada, Natural Resources Canada, Health Canada) (*see Appendix A for a list of members*).

IC3 has expanded its scope in recent years through the establishment in 2015 of a new Senate-approved sub-Centre, the Intact Centre on Climate Adaptation (ICCA), as well as integrating the Canadian Cyrospheric Information Network / Polar Data Catalogue (CCIN/PDC) research group with IC3 in 2016.

In setting a course for IC3's future, it is worthwhile to reflect on the achievements that have been realized over the first 10 years towards the original objectives set out in 2008, as outlined in Table 1.

Table 1. Highlights of Progress and Achievements Towards the Founding Objectives of IC3

Founding Objective	Highlights of Progress and Achievements (2008-2017)
1) *Create the first university-based research centre on climate change in Ontario.*	• Established the Interdisciplinary Centre on Climate Change at the University of Waterloo in 2008, the first of its kind in Ontario.
2) *Deepen interdisciplinary research on climate change at Waterloo.*	• In 2017, provided 6 seed grants for new teams of researchers with Principal Investigators from 6 different departments in the Faculties of Arts, Engineering, and Environment. • Supported the development of major external grants involving multiple IC3 members (see Objective #11). • Climate resilience is recognized in the *Disrupting the 21st Century University – Imagining the University of Waterloo @2025* report as an area of world-class research at the University of Waterloo. • Waterloo's deepening climate change talent pool has provided expertise to government, businesses, and non-governmental organizations (*see Section 2.3.2*). • IC3 and the Balsillie School of International Affairs hosted a number of workshops that brought leading academics from around the world together with UWaterloo experts to explore research collaborations (*see Section 2.3.1*).

Founding Objective	Highlights of Progress and Achievements (2008-2017)
3) *Build on existing strengths to increase further its research capacity and to develop new areas as the climate change agenda evolves over time.*	• Provided seed grants and other support to multiple workshops and publications on emerging topics, such as: International Conference on Amphibious Architecture, Design and Engineering; and Canada in a Climate-Disrupted World (*see Section 2.3.2*). • Expanded the Centre's scope by supporting the establishment of the externally-funded Intact sub-Centre on Climate Adaptation (ICCA) with a core focus on flood-damage prevention and business-led climate adaptation (*see Section 2.3.3*).
4) *Increase Waterloo's role as a repository of data and information concerning the state of the Canadian cryosphere and the Arctic.*	• Bilingual Polar Data Catalogue is recognized internationally as Canada's primary source for polar data and serves as Canada's national Antarctic data centre (*see Section 2.3.3).*
5) *Strengthen Waterloo's relationship with the Atmospheric Science and Technology Directorate of Environment Canada*	• Have continued building partnerships with branches of Environment and Climate Change Canada (e.g., co-location of staff for over 20 years). • Established new partnerships with Natural Resources Canada and Health Canada (e.g. government employee teaching in Master of Climate Change (MCC) program, core partners in Networks of Centres of Excellence application). • Led the formation of a new standing research committee on the Government of Canada's Adaptation Platform *(see Section 2.3.1*). • Blair Feltmate, Head of ICCA, named Chair, Expert Panel on Climate Adaptation and Resilience Results for the Government of Canada.
6) *Place Waterloo as a contender for a World Meteorological Organization (WMO) endorsed Regional Climate Centre (RCC) or RCC Network.*	• The IC3 request for space to proceed with an application to establish a WMO Regional Climate Centre in 2009-10 was not supported. There is no RCC in Canada currently.

Founding Objective	Highlights of Progress and Achievements (2008-2017)
7) *Enhance Waterloo's contributions to climate assessment reports such as those of the Intergovernmental Panel on Climate Change (IPCC).*	• The research of several IC3 members' was utilized in the IPCC 5th Assessment Report 2013-14 (*see Section 2.3.2*). • IC3 Director and member, Dr. Daniel Scott was a contributing author and expert reviewer for the IPCC 3rd, 4th, and 5th Assessment Reports, as well as the Special Report on Global Warming of 1.5 °C which is currently under development. • Eight IC3 members have served as IPCC contributing authors and Linda Mortsch (member and ECCC scientist co-located at UWaterloo) served as a Coordinating Lead Author on the 4th Assessment. • Two IC3 and Environment faculty members will play leadership roles in the IPCC's 6th Assessment Report (announcement expected in spring 2018). • IC3 members contributed to a workshop on the scope of Canada's next national assessment on climate change (due in 2021), and strategies to increase the engagement of academics in this next assessment (*see Section 2.3.1*).
8) *Provide graduate student and post-doctoral training opportunities beyond disciplinary boundaries.*	• In 2014, IC3 led an application on the University of Waterloo's behalf to obtain official Observing Organization status to the United Nations Framework Convention on Climate Change (UNFCCC). • IC3 has coordinated delegations to UNFCCC Conference of the Parties (COP) summits in 2013 (Warsaw), 2015 (Paris), 2016 (Marrakesh), and 2017 (Bonn). Over the years, 35 students (from 4 Faculties), 5 IC3 faculty members, and 3 staff members have participated in this international experience and network building (*see Section 2.3.4*).
9) *Explore the development of graduate programs in climate change.*	• IC3 members led the development of the Master of Climate Change (MCC) program, the first of its kind in Canada, which was approved and launched in 2013. The IC3 Director, Dr. Scott, has also served as the Director of the MCC program for its formative five years (*see Section 2.3.4*). • IC3 members contributed to the development of an online Climate Risk Management graduate-level Diploma, to be launched in 2019 (*see Section 2.3.4*).

Founding Objective	Highlights of Progress and Achievements (2008-2017)
10) Inform and educate the public and the next generation of decision-makers (youth) about climate change.	• Supported a number of public outreach projects, including collaborations with THEMUSEUM in downtown Kitchener and the Region of Waterloo, as well as a major commitment to media engagement (*see Section 2.3.3*). • Worked with students to develop a climate change ambassador program through which Waterloo students have visited over 100 high school classrooms in southern Ontario (*see Section 2.3.4*). • Currently partnering with Perimeter Institute on high school curriculum supplement. • Educational leader in Canada with the Master of Climate Change program (2013) and online Diploma in Climate Risk Management (2019) – both the first of their kind.
11) Encourage and facilitate the preparation of major interdisciplinary research grants.	• Supported the development of multiple new research team proposals (e.g., the multi-institutional Partnership for Canada-Caribbean Climate Adaptation, Climate Change and Water Adaptation Options project, and recent five-nation proposal on Climate Policy Solutions to the Canadian Institute for Advanced Research). • Led the development of a Networks of Centres of Excellence (NCE) proposal on Climate Change Adaptation (*see Section 2.3.2*).

2.3 Delivering Academic Value through Four Core Functions

A June 2017 article in the *Canadian Journal of Higher Education* (Henderson et al. 2017) found that less than half (44%) of the 50 Canadian universities/colleges examined have climate change-specific policies in place and that those policies focused disproportionately on the built-campus environment and operations, with "*underdeveloped secondary responses*" to research, curriculum development, and community outreach and knowledge-transfer.

The vision for IC3 has always been to foster more holistic campus and societal engagement in the grand challenge of climate change. To deliver on its mission to generate broad academic value for its members and the University of Waterloo, IC3 develops and supports activities in four core areas outlined in Figure 2: (1) Network Building, (2) Research Development, (3) Knowledge Mobilization, and (4) Education and Training.

As introduced in Table 1, a number of accomplishments have been made toward the original objectives set out when IC3 was established. The following sections showcase some of these results and achievements in more depth across each of IC3's four core areas of activity.

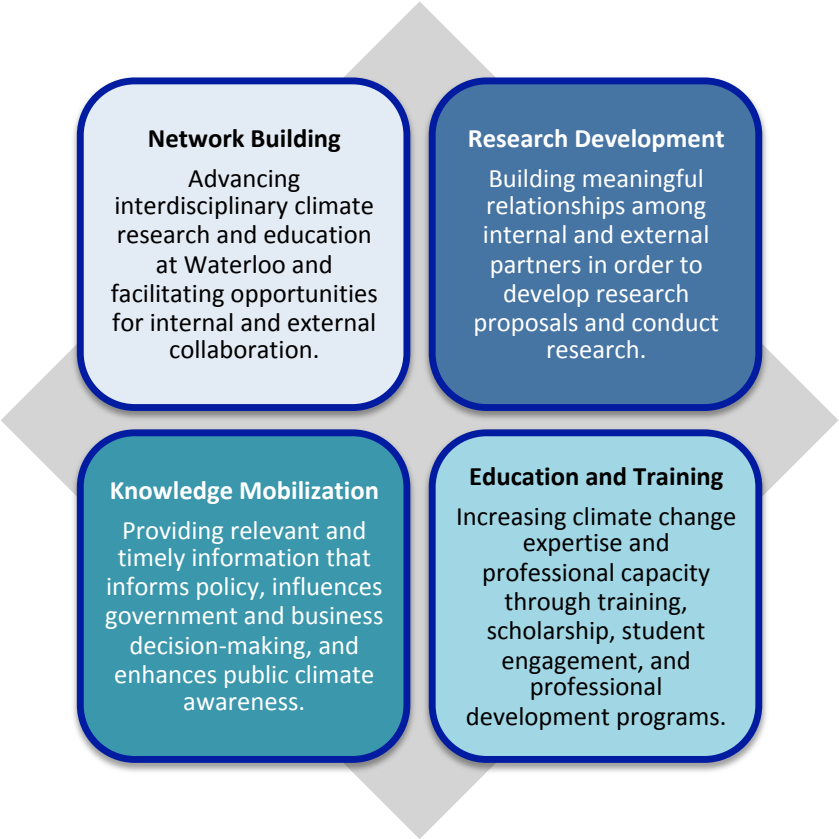

Figure 2. Four core functions of the Interdisciplinary Centre on Climate Change

2.3.1 Network Building

One of the top priorities identified in a 2014 survey of IC3 members was to provide opportunities for members to convene with colleagues and students from across campus as well as connect with researchers, stakeholders and decision-makers off campus. IC3 has used multiple initiatives to provide networking opportunities as financial resources, staff capacity, and leveraged partnerships have allowed.

Opportunities for IC3 members and students to connect with one another as well as with off-campus partners have been fostered through:

1) Hosting seminars and workshops, including partnering with the Balsillie School of International Affairs and the Centre for International Governance Innovation to host high-

profile CIGI lectures by Dr. Mike Hulme (King's College, London) in 2013 and Johan Rockström (Stockholm Resilience Centre) in 2015.

2) Leading University of Waterloo delegations to United Nations COPs and meeting there with Canadian government representatives, academic institutions and research centres, youth groups, and NGOs. For example, in 2014 at COP19, Waterloo's student group met with the Minister of Environment for Canada to share their perspective on Canada's climate commitments, and in 2015 at COP21, a group of Waterloo students had a chance to sit down for a conversation with Green Party leader Elizabeth May.
3) Supporting student-organized colloquiums (2009-2011) to showcase graduate student research, other student-led initiatives such as enerLOO in 2017 (see Box 1), and ongoing networking activities organized by the Climate Students Group (2014-present).
4) Coordination or support of multiple workshops/conferences in Waterloo, including:
    - Partnership with Balsillie School of International Affairs to host the international 'Grand Challenge of Climate Change: An Interdisciplinary Workshop' in October 2013.
    - Partnership with the Water Institute, Balsillie School of International Affairs, and the International Development Research Centre to host the 'How (well) are we Adapting to the Water-related Impacts of Climate Change?' workshop in June 2014.
    - Partnership with Balsillie School of International Affairs and SSHRC to host the 'Global Climate Governance and Canadian Policy: Looking Forward to Paris 2015' workshop in March 2015.
    - Partnership with the Waterloo Chair in Science and Society to lead a World Wide Views on Climate and Energy workshop, which was 1 of 97 events simultaneously held across 75 countries on June 6, 2015. The Waterloo event featured 100 diverse Canadians who engaged in the largest-ever global citizen consultation (over 10,000 people globally) on fossil fuel exploration, carbon pricing, and global responsibilities.
    - Partnership with the Office of Research, Ontario Centres of Excellence (OCE), Waterloo Institute for Sustainable Energy (WISE) and the Centre for Bioengineering and Biotechnology (CBB) to co-host the Industry-Academic Networking Forum on Greenhouse Gases in October 2016.
    - Partnership with Balsillie School of International Affairs and SSHRC to host the 'Canada in a Climate Disrupted World' workshop in April 2017.
    - Partnership with the Water Institute and Faculties of Engineering and Environment to co-sponsor the 'International Conference on Amphibious Architecture, Design and Engineering' in June 2017.

Box 1. enerLOO Student Workshop on Energy Futures

The University of Waterloo was chosen as one of the communities representing youth in a global dialogue on energy futures and climate change. This engaging energy workshop was facilitated by the Climate Students Group and the University's Generation Energy Champion, Sara Ganowski (Graduate Student, School of Environment, Resources and Sustainability, *pictured*).

The results of the event were fed up into the Generation Energy campaign convened by Natural Resources Canada to ask young citizens to envision what they want our country's energy future to look like.

In addition to facilitating the conditions conducive for individuals and groups to connect as described above, IC3 has directly collaborated with other organizations across the Canadian climate change network. For example:

- From 2015 to 2017, IC3 invested considerable time and resources in strengthening partnerships with government and other key stakeholders to raise the profile of IC3, its members, and Waterloo as a leader in climate change research. This established the foundation for IC3 to lead, on behalf of the University of Waterloo, the development of a national network of partners who submitted a Networks of Centres of Excellence (NCE) proposal on Climate Change Adaptation to the 2017 NCE competition (see Box 2).
- IC3 was asked to participate in both a workshop in May of 2016 on the scope of the next national climate change assessment (due in 2021) and a working group to examine ways to increase the participation of academics in the assessment process.
- In May 2017, IC3 presented to the Government of Canada's Climate Change Adaptation Platform Plenary (composed of 36 members including: 10 federal departments, all provincial and territorial governments, three national Indigenous organizations, and representatives of national municipal, industry, business and professional organizations). IC3 representatives proposed the concept of a standing research committee to engage the academy in the Platform and ensure strong alignment and co-

design of research and training required by its diverse membership. The proposal was endorsed and its mandate and structure are currently being developed.

- One of ICCA's programs is focused on working with businesses on a sector-by-sector basis (e.g., electricity, commercial real estate, telecommunications, etc.) as well as banks, institutional investors, credit rating agencies and securities commissions, to identify, and reduce, climate change and extreme weather risks.
- Blair Feltmate, Head of ICCA, expands Waterloo's influence and network building through leadership roles such as acting as the Co-Chair of the Electricity Sector Adaptation Standard led by CSA Group, and recently being named the Chair of an Expert Panel on Climate Adaptation and Resilience Results for the Government of Canada.
- CCIN hosted a large contingent from the Canadian and international polar data community for the Canadian Polar Data Workshop and International Polar Data Forum II held on campus in 2015.

2.3.2 Research Development

IC3 members are actively engaged in all of the three main areas of climate change research set out by the IPCC working group structure: (1) physical science of the climate system; (2) impacts, adaptation and vulnerability; and (3) mitigation of climate change.

A review of IC3 member research outputs leading up to the most recent IPCC 5th Assessment report in 2014 found that between 2008 and 2013, IC3 members published in a variety of channels, most significantly: 600+ peer-reviewed publications, followed by 150+ non-refereed publications, and 80+ books and book chapters. A search of the 5th Assessment Reports from each of the three IPCC Working Groups documented the number of times that IC3 members' publications were cited. Figure 3 shows the number of individual publications cited and the number of chapters IC3 member's work was cited in by the IPCC.

The University of Waterloo has a strong cluster of expertise in Working Group 2 (impacts, adaptation and vulnerability). This cluster of expertise was foundational for the establishment of the Intact sub-Centre on Climate Adaptation (see Section 2.3.3) and the development of the Network of Centres of Excellence application on climate adaptation (see Box 3). There is great potential to expand these collaborations and increase research funding as a survey for the 2015-16 Waterloo Sustainability Report found that climate change had the most faculty engagement among sustainability research areas (Figure 4).

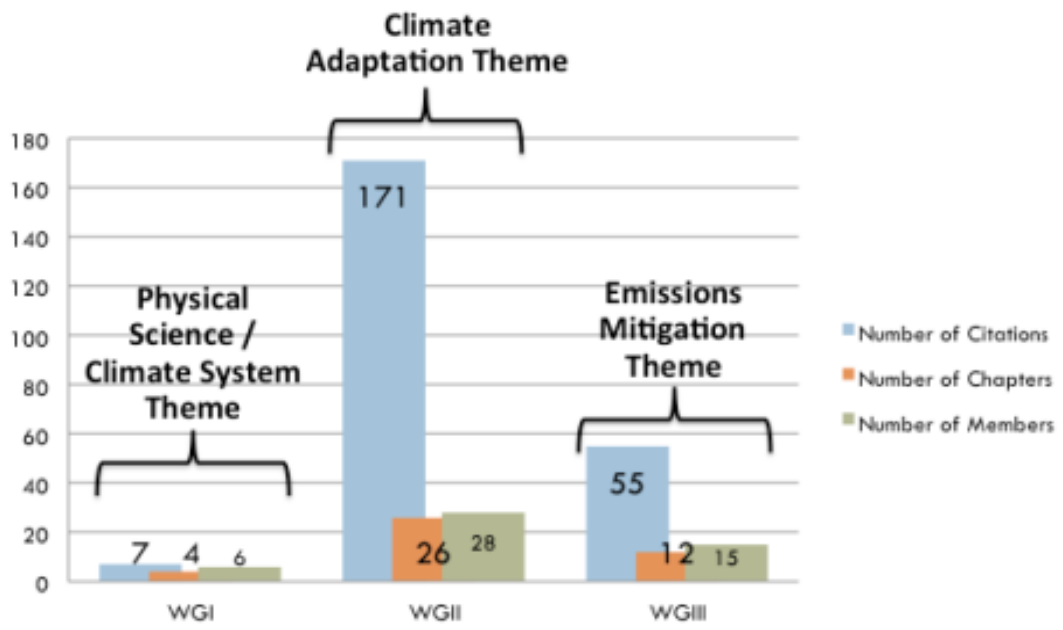

Figure 3. Citations of IC3 Member Research in the IPCC 5th Assessment Report
Source: IC3 SGRC Renewal Report, 2014

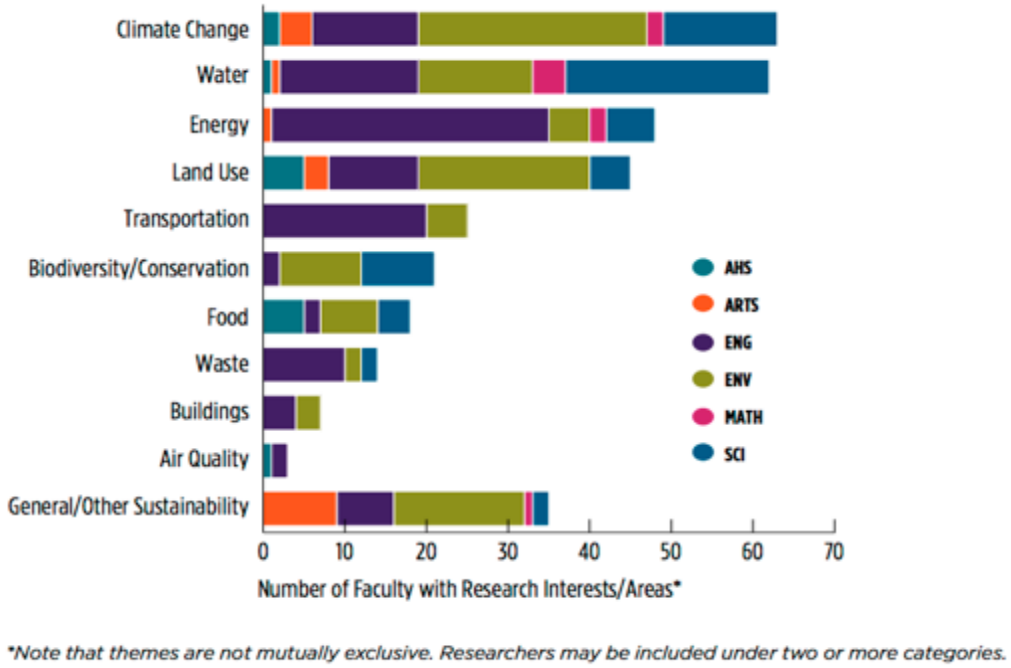

Figure 4. Sustainability-Themed Research Among Waterloo Faculty
Source: University of Waterloo Environmental Sustainability Report (2015-2016)

Box 3. Working Toward a Canadian Climate Adaptation Networks of Centres of Excellence

Input from IC3 members and external stakeholders at the start of IC3's second five-year term indicted support for pursuing a large-scale research proposal. As a result, IC3 dedicated significant time and resources to lead the development of an application for a climate change adaptation network to the 2017 Networks of Centres of Excellence competition ($52.8 million over its first five-year cycle). The development of this proposal included IC3 co-hosting five consultation workshops and holding over 70 meetings with federal, provincial, and territorial departments, all three national Indigenous groups, multiple professional associations, leading international adaptation research networks, numerous boundary organizations, and research centres and universities nationwide.

The goal of the Canadian Climate Adaptation Network (CANadapt) is to create and mobilize knowledge (inclusive of natural, health, social sciences and local and traditional perspectives) and experience from 33 Canadian universities, four regional adaptation centres, 17 federal/provincial/territorial departments/agencies, and 19 civil society/private sector/professional organizations on three overarching challenges:

(1) building climate-resilient communities;
(2) creating a climate-competitive economy; and,
(3) responding to strategic risks and opportunities of an increasingly climate-disrupted world.

The CANadapt proposal was not successful. However, the partnerships that have been created position IC3 for leadership to accelerate adaption to the myriad of unknown future challenges from accelerating climate change.

Dean of the Faculty of Environment, Jean Andrey (far right), soliciting input on the CANadapt proposal at the Adaptation Canada event in Ottawa in April 2015.

In terms of research development, an IC3 member survey completed in 2014 demonstrated strong support for connecting and supporting interdisciplinary teams for large-scale proposals and providing smaller seed grants to support emerging projects and research teams. IC3 has distributed notices of highly relevant research calls to its members and at times invited members to meet to discuss potential proposal development. Examples of success:

- The creation of a multi-institutional research project (Partnership for Canada-Caribbean Climate Change Adaptation), led by IC3 members from four departments was awarded $2.5 million (over 2012-2016) in the International Research Initiative on Adaptation to Climate Change co-funded by International Development Research Centre (IDRC) and the Canadian Research Councils (SSHRC, NSERC, CIHR).
- In 2018, IC3 co-led a five-nation proposal on climate policy solutions to the Canadian Institute for Advanced Research.

With increased funding from the Provost beginning in 2015/16, IC3 was able to provide small seed grants to teams of UW researchers. To date, six projects have been supported with Principal Investigators from Architecture; Political Science; Environment, Enterprise and Sustainability; Geography and Environmental Management; Planning; and Knowledge Integration. An illustrative example of this 'seeds to success' program has been the multi-department team working on the future of flood risk in Canada in an era of climate change, which has turned initial seed funding into a highly successful program of research funded by SSHRC and two Networks of Centres of Excellence (see Box 4).

Box 4. Flood Policy Research Group: Responding to Canada's Changing Flood Risk in an Era of Climate Change

IC3 provided a seed grant and other support to Jason Thistlethwaite (School of Environment, Enterprise and Development) and Daniel Henstra (Department of Political Science) to facilitate new cross-Faculty research collaborations and grant development. They have built on this support to expand their partnerships to include the *Partners for Action* applied research initiative (established at Waterloo in 2015 through funding from The Co-operators Group Ltd. and Farm Mutual Reinsurance Plan) and tremendous external funding success, including grants from SSHRC, the Canadian Water Network NCE, and the MEOPAR NCE.

IC3 provided further research and communications support for a 2017 plain-language report 'Canadian Voices on Changing Flood Risk: Findings from a National Survey' that was widely covered by national and international media (150+ appearances), including an editorial by the Globe & Mail citing the report as justification for policy change as well national appearances on *CBC The National* and *CBC The Current* (10 million views). According to Waterloo Media Relations, this work received the most media attention for the university in 2017. This publication and related media coverage was also the impetus for invitations to present at two

high level forums on flood risk management: Quebec Forum on Flood Risk Management (Oct. 2017 - attended by 60 politicians and public servants, including three provincial Cabinet Ministers) and a National Roundtable on Flood Risk (Nov. 2017 – organized by Public Safety Minister, Ralph Goodale, and attended by 50 high-level federal public servants and other national experts).

IC3 members, Daniel Henstra (left) and Jason Thistlethwaite (right), with Minister Goodale (centre), after they presented at the National Roundtable on Flood Risk in November 2017

2.3.3 Knowledge Mobilization

Consultations with IC3 members in the past has revealed strong support for initiatives that facilitate applied research partnerships with communities, business and government agencies as well as showcase member expertise and support the mobilization of their research through diverse communication channels. The American College & University Presidents' Climate Commitment calls for higher education institutions to support their local communities to raise awareness and capacity to build climate resilience and accelerate decarbonisation.

Highlights of IC3's efforts related to media engagement, public outreach and applied research are provided below. Perhaps the most significant effort to increase research and knowledge mobilization capacity has been through the addition of two sub-centres in strategic areas: Canada's north and the private sector. The Polar Data Catalogue is described in Box 5, while details on the Intact Centre on Climate Adaptation can be found in Box 6 below.

Media engagement

- IC3 has provided communications advice and support to several members and teams, including contributing to panel discussions and workshops on media training coordinated by UWaterloo Media Relations and the Science Media Centre of Canada.
- In collaboration with its members and Media Relations, IC3 has developed press releases and supportive communications materials (plain-language summary, op-eds, media-ready graphics) that have resulted in some of largest media coverage of Waterloo research stories.
    - For example, the IC3 and Media Relations communication plan associated with the 2014 Winter Olympics received substantial international media coverage (see Figure 5 for a sample of the over 140 media outlets in 24 countries that covered the story) and estimated total earned media exposure of over $1 million. A 2018 update that included the Winter Paralympics was picked up by 116 news outlets with a potential reach of over 40 million (according to Meltwater Impact report obtained by Media Relations).
    - A similar strategy was applied to the flood risk work of IC3 members in 2017 with equally successful exposure (over 150 known media appearances – see Box 4).

Figure 5. Selection of International Media Outlets that Covered Winter Olympics Publications in 2014 and 2018

Community and public outreach

- A number of IC3 members (Goretty Dias, Sarah Burch, Paul Parker, Ian Rowlands) have been engaged in the development and ongoing implementation of Waterloo Region's Climate Action Plan, which is co-led by REEP Green Solutions, a non-profit organization co-founded in the mid-1990s by three IC3 members (Paul Parker, Ian Rowlands, and Daniel Scott).
- IC3, along with the Water Institute and UWaterloo Community Relations, co-sponsored the *Nature Unleashed* exhibit at THEMUSEUM in downtown Kitchener (2016), bringing climate change education to thousands of visitors of all ages.
- IC3 and the Department of Geography and Environmental Management supported the Climate Student group's effort to develop a climate change-teaching module that was delivered by Master of Climate Change student interns to over 100 high school classes in the Greater Toronto Area, Ottawa and Waterloo Region in 2017.

Applied research

- In 2018 IC3 partnered with the Balsillie School of International Affairs and Wilfrid Laurier University to host a workshop on climate change and security for a delegation of 25 Officers from the Saudi Arabian Armed Forces, at the request of the Canadian Armed Forces and Royal Embassy of Saudi Arabia.
- IC3 partnered with the Balsillie School of International Affairs in early 2017 to host a workshop on 'Canada in a Climate Disrupted World', which led to the development of a team that was awarded a knowledge synthesis grant under SSHRC's *Imagining Canada's Future* initiative (2017), that emphasized the mobilization of research knowledge to inform decision-making and practices across private, public and community sectors.
- IC3 coordinated a multi-department research team, led by Dr. Chris Fletcher, to prepare a localized climate change projections report for municipal staff in Waterloo Region. This report provided localized temperature and precipitation projections for the region, and IC3 developed a supporting infographic for wider dissemination (see Figure 6). The research team presented the findings to Regional and City Councils in Cambridge, Kitchener and Waterloo, as well as to the Grand River Conservation Authority.

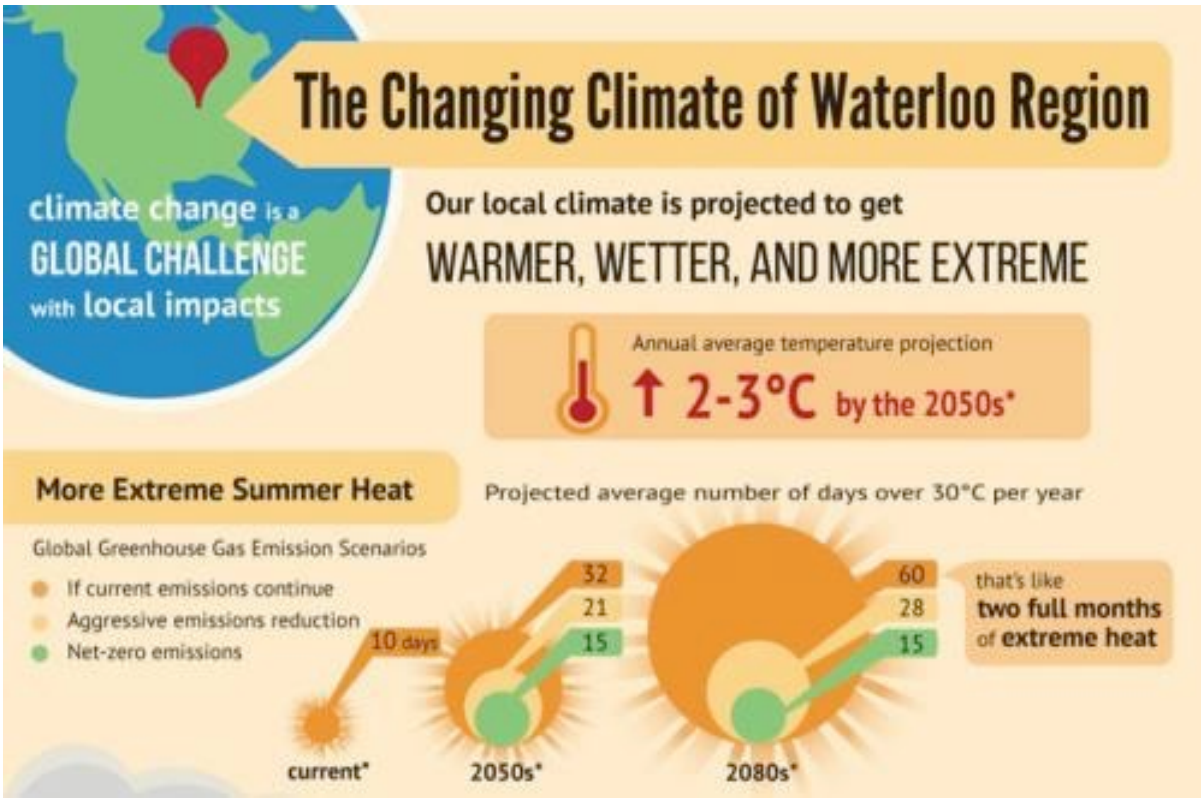

Figure 6. Excerpt from an infographic prepared for Waterloo Region municipalities as part of an applied research project led by IC3 member, Chris Fletcher

Speaking engagements

- In 2015, IC3 was invited by the Partnership Group for Science and Engineering and the Federation for the Humanities and Social Sciences to co-lead a *Big Thinking on the Hill* breakfast lecture on the implications of climate change and extreme weather for Canada. The lecture series brings leading Canadian researchers to Parliament to speak on policy-relevant topics with MPs, senators, public servants, and other stakeholders, to mobilize research among decision-makers and the media.
- IC3 has been invited to a wide range of academic, professional and public speaking events throughout southern Ontario and Canada. IC3 has endeavored to engage its members in these opportunities to the extent possible, particularly early- and mid-career members to provide them opportunities to network and raise the profile of their research/expertise. Where possible we have similarly attempted to distribute media requests to members with specific related expertise.

Box 5. Canadian Cryospheric Information Network and Polar Data Catalogue

The Canadian Cryospheric Information Network (CCIN) has been located at the University of Waterloo since the mid-1990s. It was created to serve the data management needs of Canada's cryospheric research community, and expanded in mid-2000s with the launch of the Polar Data Catalogue (PDC) as a metadata discovery portal. The mandate of CCIN have been to:

- provide a data and information management infrastructure for the Canadian cryospheric research community,
- enhance public awareness and access to cryospheric information and related data, and
- facilitate the exchange of information between researchers, northern communities, decision makers, and the public.

CCIN/PDC has become one of Canada's primary sources of polar data and information, and is recognized internationally as a leading expert in polar research data stewardship. Recent highlights and accomplishments of CCIN and the PDC include:

- The PDC contains 2,606 metadata and >2.9 million data files (2.5 million added since 2014).
- The PDC Metadata and Data Input online application was completely rebuilt in 2016, so that it is now fully bilingual.
- RADARSAT imagery available including 28,000+ images of northern Canada and mosaics of Antarctica (1997, 2000, 2008).
- Increasing engagement with Canadian and international polar data community:
  - -Hosted the Canadian Polar Data Workshops (2015 and 2017) and International Polar Data Forum II (2015),
  - -Canadian representative on numerous international advisory bodies for polar data management,
  - -100th member of the World Data System.
- Selected recently as Canada's National Antarctic Data Centre.
- Journal publications and conference participation by CCIN staff, in Canada and many international venues (US, Japan, India, Bulgaria, Indonesia).
- DOI registration process - assigned 300+ DOIs in 2016 (provides credit to researchers for publishing their data).

CCIN annual funding from 2010-2017 has ranged between $360,000 and $590,000. It currently has 4 full-time staff, 2 part-time staff and employs Waterloo Co-op students throughout the year. Their office is located in the Environment 1 building. CCIN merged under the IC3 umbrella in 2016 and now operates as a sub-Centre, as per the organizational structure described in Section 3.3, providing important data management and knowledge.

Box 6. Intact sub-Centre for Climate Adaptation

In 2015, IC3 worked closely with the Dean of Environment and Advancement to support the establishment of the Intact sub-Centre on Climate Adaptation (ICCA), which was funded through a major gift ($4.25 million over 5 years) from the Intact Financial Corporation. The mandate of ICCA is to conduct research and promote knowledge mobilization with homeowners, communities, governments and businesses aimed at de-risking the negative impacts of a changing climate and extreme weather. ICCA is headed by IC3 member, Dr. Blair Feltmate, and currently has 5 other full-time staff and additional part-time/Co-op students. Its current three main core program areas are:

1. The Home Flood Protection Program which has developed an on-site flood risk evaluation service, known as the Home Flood Protection Assessment, and is training third-party delivery agents for implementation in communities across Ontario and in other provinces.

2. The Infrastructure Adaptation Program that is working toward the development of national standard(s) for new and existing flood-resilient residential communities and building the business case for natural infrastructure (e.g. wetlands) preservation.

3. The Corporate-Specific Adaptation Program that focuses on engaging business sectors (commercial real estate, electricity, telecommunications) to identify climate change risks and practical and cost-effective means to limit those risks.

Recent highlights and accomplishments of ICCA include:

- As of the end of 2017, ICCA had attracted over $500,000 in additional external funding to support these 3 program areas including funding from the Standards Council of Canada, Ministry of Natural Resources and Forestry, Ducks Unlimited, Health Canada, Manulife, City of Burlington, and the Ministry of Environment and Climate Change.
- In 2016, the ICCA team presented at over 75 events across the country, including in Alberta, Ontario, Quebec, Nova Scotia and Newfoundland. These events have engaged all levels of government, Canadians, academia, non-profits, businesses and aboriginal groups.
- ICCA was frequently in the media in 2017 including mentions in the Globe and Mail, BNN, Maclean's, CBC News, Huffington Post, TVO, CTV News, Canadian Underwriter, Metro News, Global News, and the National. Of particular note is that CBC's The Current launched a 30 part series on adaptation. The inaugural episode featured the Home Flood Protection Program and Dr. Blair Feltmate is an advisor for the series.

ICCA released "Preventing Disaster Before it Strikes: Developing a Canadian Standard for New Flood-Resilient Communities" in collaboration with Standards Council of Canada (SCC) that SCC used as a framework to fully fund a national standard in Canada on flood-resilient community design.

2.3.4 Education and Training

International education and workforce needs assessments underscore the growing demand for educated and highly skilled employees in several sectors and professions. These reviews have concluded that educational institutes are not adequately training new graduates with specialized skills to meet climate change demands (European Union 2009, GHG Institute 2010), and that higher education is failing to adequately educate society about climate change (ACUPCC 2012, Brown University 2012, Canadian Association of University Teachers 2018). The American College and University President's Climate Commitment (ACUPCC) (2012) strongly emphasized the important role of education in its climate change commitment:

> "While higher education only represents about 2-3% of the country's carbon footprint, it represents 100% of the 'education footprint,' in that our institutions teach not only our college students, but also the teachers who need to be equipped with the knowledge and skills to adequately prepare our K-12 students for the new challenges of the 21st century. … Our leaders of the future – the scientists, economists, authors, politicians, journalists, etc. – will need to understand and contribute to solving the challenges we are facing. There is clear indication, however, that college and university graduates are *not being prepared* to deal with the complex, cross-disciplinary problems that global culture now faces."

Development of new educational programming

Consistent with the University of Waterloo's long-standing reputation of anticipating society's needs, we have been innovators and leaders in climate change education and training with the launch of the Master of Climate Change (MCC) program in 2013.

IC3 was the catalyst for the development of Waterloo's MCC program, which provides a unique interdisciplinary educational experience to students interested in the many emerging career paths in climate change science, policy and management. It is the only program of its kind in Canada and one of few in North America (with Columbia University's Climate and Society program the closest comparator). The Director of IC3 has served as the Director of the MCC program since its inception (2013-present) and several IC3 members have been integral to its success, with contributions to program/curriculum development, course offerings, supervision of major papers and internships, and professional mentoring. The MCC program has attracted over 260 applicants from around the world in the first 5 years (31% international). The 2017-18

class brought together 33 students from highly diverse disciplines, including: Political Science, International Relations and Foreign Affairs, Biotechnology, International Development and Globalization, Journalism, Earth and Environmental Science, Environmental Engineering, Agriculture, Biology, Marketing, Environment and Business, Management Science, Economics, Peace and Conflict Studies, and Geography.

A recent review of the state of climate change professional practice in the US (Moser et al. 2017) called on universities to develop practice-oriented curricula and work closely with practitioners in graduate-level and professional training. Waterloo has anticipated this need and has been working with professionals in the evolution of the MCC program (including a course offered in collaboration with Health Canada staff) and IC3 members have contributed to the University's goal to reshape the traditional classroom and expand the reach of our pioneering climate change curriculum through the development of an online Climate Risk Management Diploma. A successful proposal to the Ontario e-Campus program ($330,000 in 2016) is supporting the fully online graduate-level diploma with courses developed in collaboration with professional associations and practicing professionals.

IC3 members have had meetings with Ministry of Education staff to examine ways to support the evolving climate change competencies in the high school science, math and geography curriculum.

"Climate change is upon us and education is the most effective tool we have to mitigate and adapt to it. The University of Waterloo, as it did in the high-tech revolution, is leading the way with an innovative program that will equip Canada to face our greatest challenge."

- John Bennett, Executive Director, Sierra Club of Canada, July 2013

Left: Master of Climate Change candidate, Ena Ristic, was part of the Waterloo delegation to the UN Climate Change Conference COP23 in Bonn, Germany in November 2017 (Source: Steven Jia).
Right: Garrett Mombourquette (MCC '16) completed his internship with Parks Canada as a Resource Conservation Technician in New Brunswick (Source: Nigel Fearon Photography).

Experiential learning

As part of its commitment to support the development of a new generation of climate change professionals, for the past five years IC3 has supported a major experiential learning and international networking opportunity for students across campus – participating in United Nations Climate Conferences, known as Conferences of the Parties (COPs). In the first two years, IC3 provided funding as well as faculty and staff advisory support for a strong, self-organized student effort that resulted in a group of Waterloo students going to COP19 in Warsaw and COP20 in Lima with delegations of a Canadian NGO. After seeing the experiential learning benefits of this opportunity, IC3 led the application for the University of Waterloo itself to become an accredited Observing Organization of the UN Framework Convention on Climate Change (UNFCCC) starting in 2015. Obtaining observer status has enabled IC3 to coordinate and support accredited delegates from Waterloo to the annual COPs.

In total, 37 Waterloo students and eight IC3 member faculty or staff have attended COP events in Warsaw, Lima, Paris, Marrakesh, and Bonn (see Figure 7). Many more students have also been involved in 'home team' activities of peer-to-peer learning and campus outreach which are led by Climate Students, IC3's affiliated group of undergraduate and graduate students who are interested in extracurricular climate change education and awareness. Applications for the limited number of accredited student delegate positions have been very competitive (more than 200 over five years). This experience has been supported financially in part by the Deans of each Faculty that selected students are from as well as from their departments. The 2017 delegation involved students from seven different departments. Student blogs and video of the student delegate experience at COP 23 in Bonn (including a welcome in six languages!) testify to this extremely valuable international experience.

The importance of supporting our students to engage in the grand challenge of climate change at a global scale is captured persuasively in the ambition of the Youth Climate Lab, co-founded by Dominique Souris (BES '15) who has served as a valuable member of the Seychelles delegation for many years and has also been an active student leader in Waterloo's engagement at COP:

> "*No challenge poses a greater threat to future generations than climate change. Today's youth are set to inherit the consequences of present-day decisions, yet limited opportunities exist for them to contribute meaningfully. … Youth are calling for greater action, however, have limited opportunities to constructively engage in negotiations to enhance climate ambition. We want to change that*."

Figure 7. Waterloo Student Delegates at United Nations Conference of the Parties

SECTION 3: Transition to a University Research Centre (2018 onward)

3.1 Increasing IC3's Impact

Much has changed over the decade since IC3 was established. Evidence of the multi-decade warming of the planet has been unrelenting and significant advances have been made in our understanding of changes in extreme weather and other environmental systems associated with climate change (IPCC 2014, USGCRP 2017). Many of the observed changes since the 1950s are unprecedented over decades to millennia. In 2016, the atmospheric concentration of CO_2 surpassed the landmark 400 parts-per-million threshold; a level that last occurred over 3 million years ago (USGCRP 2017).

Recognizing that climate change is now a permanent condition that threatens decades of progress on health and economic development, the Paris Climate Agreement was signed by 195 countries in December 2015 (now ratified by 174 UNFCCC Parties). Global climate finance (investment in mitigation and adaptation) reached a record of US$437 billion in 2015 (Climate Policy Initiative 2017). Canada's First Ministers adopted the Pan-Canadian Framework on Clean Growth and Climate Change in December 2016, to accelerate GHG emission reductions and climate change adaptation across the country. Ontario's Ministry of the Environment and Climate Change (the recent addition of "climate change" to the name is itself a significant indicator of the increased priority) developed the provincial Climate Action Plan, which included joining a cap-and trade carbon market, alongside Quebec and California, in early 2017.

With the challenges of adapting to climate impacts now an everyday reality for decision makers across the country and recognition that today's disasters and disruptions reflect relatively modest climatic changes, political and business leaders increasingly understand the salience of addressing the consequences of unavoidable climate change. The 'adaptation services' market in the US is estimated to grow four-fold between 2010-2020 (Climate Change Business Journal 2016). Recognizing that work toward the 2030 Sustainable Development Goals would be undone by climate change, the international community has pledged to mobilize US$100billion per year to support mainly adaptation in highly vulnerable countries (equivalent to the level of all current official development assistance) (UNEP 2017).

The dramatic increase in knowledge requirements and investment in climate change mitigation and adaptation at local, provincial, national and international scales represents a tremendous opportunity to build on previous investments in IC3 to create a world-class climate change centre that will significantly elevate the academic value it delivers to the University and society. As outlined in Section 2, IC3 has achieved considerable success toward it original objectives (see Table 1) with modest financial resources and personnel (see Table 4). The transition to a

University-funded Research Centre would enable IC3 to expand its activities in targeted areas so as to solidify its status as a nationally-leading Centre, including:

1) **Strengthened Domestic and International Partnerships:**
   - Leverage the many new partnerships established during our leadership of the Networks of Centres of Excellence proposal to strengthen relationships with Canadian governments, professional and industry associations, boundary organizations, as well as internationally-leading centres and networks (including the newly established Global Centre of Excellence for Climate Adaptation in the Netherlands).
   - Support IC3 member engagement and leadership within the IPCC and other international research networks.
2) **Enhanced Research Support:**
   - Enhance the pilot seed grant program to foster member networking and advance research proposal development to increase success with Granting Councils, government and other external funding.
   - Chair the Standing Research Committee of Canada's Climate Change Adaptation Platform to catalyze research partnerships between its members (which include 10 federal departments, all provincial and territorial governments, three national Indigenous organizations, and representatives of national municipal, industry, business and professional organizations) and Canada's research community.
3) **Creation of an On-Campus Climate Collaboration Space:**
   - Collaboration space was highlighted as a key function of Centres/Institutes and interdisciplinary programs by the Waterloo Committee on Senate-Approved Centres and Institutes in 2011. The opening of the net-positive energy Evolv1 building in the David Johnston Research & Technology Park represents a unique opportunity for IC3, its sub-centres (ICCA and CCIN/PDC), and the MCC program to co-locate, together with other Centres/Institutes (e.g., Waterloo Institute for Sustainable Energy) and private sector and non-profit organizations with strongly aligned research and knowledge mobilization interests (e.g., Sustainable Waterloo Region). The potential synergies offered by this cluster are tremendous.
4) **Strengthened Knowledge Mobilization and Communications Capacity:**
   - Hire a dedicated knowledge mobilization specialist to assist members to communicate successes, translate research into plain language, align research with applied policy and practice needs, and raise the profile of Waterloo for climate change innovation.
5) **National and International Educational Leadership:**
   - Contribute to the advancement of Waterloo's national and international leadership in climate change education and professional training, through targeted internships and member engagement initiatives.

- Participate in the newly created Universities Network for Climate Capacity, established to support Article 11 of the Paris Climate Agreement on global capacity building.

In order for this vision to be realized, the following sections (3.2-3.5) outline the governance, personnel and budget proposed for IC3's transition to a University Research Centre. These core elements of the transition plan would be the starting point for the strategic and operational work that will be subsequently led by the Governing Committee and Executive Director, with support from two dedicated IC3 staff as well as externally-funded staff teams that comprise the Intact (sub) Centre and Polar Data Catalogue.

3.2 Transition Plan

Should this proposal to elevate IC3 to a University-funded Research Centre be approved, the next major steps in the transition would include:

Transition Step	Timing	Responsibility
1. SGRC approval of funding *(purpose of this report)*	March/April 2018	Current Executive Director
2. Convene Governing Committee (see Section 3.3.1)	April/May 2018	Responsible Officer (VP-Research), with support of Dean of Environment and current Executive Director
3. Recruit New Executive Director (see Section 3.3.3)	May-August 2018 (current Executive Director's five-year term ends 30 June 2018)	Governing Committee
4. Establish IC3 Advisory Board (see Section 3.3.2)	Fall 2018	Governing Committee and new Executive Director
5. Hire IC3 staff team (see Section 3.3.4)	Fall 2018	New Executive Director
6. Conduct strategic planning process (including consultations with members and Advisory Board) and seek SGRC approval for IC3's five-year renewal cycle in 2019	Fall 2018-Winter 2019	New Executive Director and staff team, as directed by Governing Committee

3.3 Governance and Organizational Structure

A new governance, reporting and operational structure will be required for IC3 to fulfill the ambitious scope of objectives of a University Research Centre and ensure compliance with *Policy 44 – Research Centres and Institutes*. IC3's proposed organizational chart is shown in Figure 8 and described in the sections following.

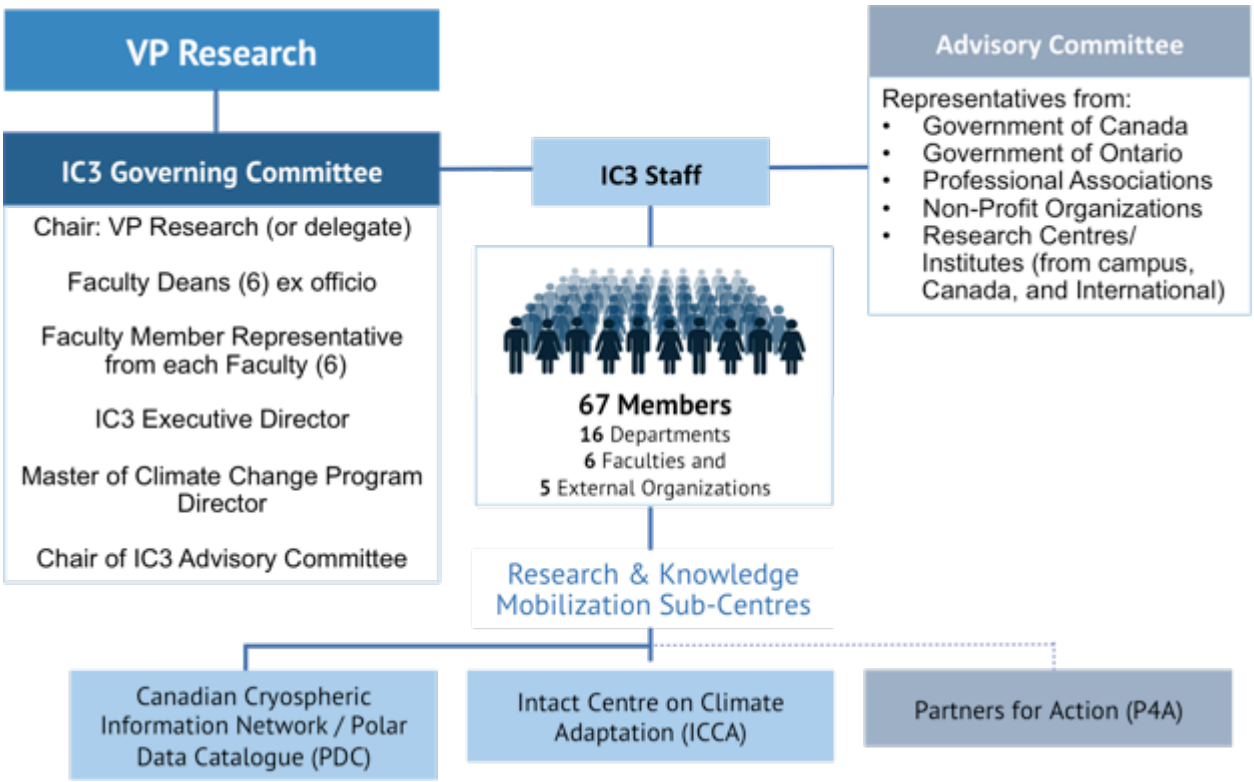

Figure 8. Proposed IC3 Organizational Chart

3.3.1 Governance

A revised Governing Committee will oversee IC3's activities. This committee will include:

1) VP Research or delegate *(Chair, Responsible Officer)*
2) IC3 Executive Director (regular faculty)
3 to 8) the Deans of participating Faculties *(ex officio voting members)*
9 to 14) one regular faculty representative from each of the six Faculties
15) Director, Master of Climate Change academic program (regular faculty)
16) Chair, IC3 Advisory Board

The proposed composition of the committee is consistent with Policy 44, in conjunction with Policy 76 – Faculty Appointments, that requires at least 50% of the governing body be made up of regular faculty members. Regular faculty members will serve for a non-renewable term of up to four years to provide for regular rotation of the membership.

The Governing Committee will have the authority to execute and monitor the affairs of IC3, subject to all applicable University policies, procedures and guidelines. This includes the ability to:

- Enact rules and regulations for membership of the Governing Body and conduct of its affairs;
- Recommend appointment of the Executive Director and other staff;
- Appoint and remove Members, and establish categories of membership and associated fees;
- Contribute to and implement IC3's strategic plan;
- Establish processes to manage and monitor financial affairs (annual budget review);
- Establish and enforce rules and regulations governing activities, provided such rules and regulations are consistent with University policies, procedures and guidelines; and,
- Establish committees as deemed necessary to discharge its responsibilities.

The Governing Committee will meet at least once per year and will be open to members of IC3. Quorum shall consist of a majority of Regular Faculty at the University of Waterloo as defined in Policy 76 – Faculty Appointments. Minutes will be taken at every meeting and made available to the members.

A list of proposed Governing Committee members is provided in Table 2. The members from each Faculty (committee members #9 to 14) have indicated their willingness to serve on the committee should SGRC approve this proposal.

Table 2. Proposed Governing Committee Members *(pending SGRC approval)*

1. Responsible Officer & Committee Chair	Charmaine Dean, Vice President – Research
2. IC3 Executive Director	Daniel Scott, Geography & Environmental Management, Environment (until June 2018)
3-8. Deans of participating Faculties (ex officio)	• Arts: Douglas Peers • Applied Health Sciences: James Rush • Engineering: Pearl Sullivan • Environment: Jean Andrey • Math: Stephen Watt • Science: Terry McMahon
9-14. one regular faculty representative from each of the six Faculties	• Arts: Daniel Henstra (Political Science) • Applied Health Sciences: Craig Janes (Public Health & Heath Systems) • Engineering: Bryan Tolson (Civil Engineering) • Environment: Chris Fletcher (Geography & Environmental Management) • Math: Francis Poulin (Applied Math) • Science: Nandita Basu (Earth & Environmental Science)

15. Director, Master of Climate Change program	• Daniel Scott, Geography & Environmental Management
16. Chair, IC3 Advisory Board	• TBD (see Section 3.3.2)

3.3.2 Advisory Board

The IC3 Advisory Board would include members that lead related centres on campus or are external to the University to provide broad research and professional expertise to guide strategic planning and future initiatives of IC3. A proposed list of members to invite to the Advisory Board is provided in Table 3. The Advisory Board would also provide advice on partnerships and research and knowledge mobilization opportunities. The Advisory Board will meet at least once per year (including by video conference) and provide an external evaluation of progress and recommendations to IC3 staff and its Governing Committee.

Table 3. Proposed Advisory Board Membership *(to be invited pending SGRC approval)*

Sector	Organization	Proposed Representative
International	United Kingdom Climate Impacts Programme (UK-CIP)	Roger Street
Federal Government	Natural Resources Canada, Canada's Adaptation Platform	Elizabeth Atkinson
	Health Canada	Peter Berry
Provincial Government	Ontario Ministry Environment & Climate Change	James Scott
Local Government	Region of Waterloo	David Roewade
	Federation of Canadian Municipalities	Devin Causley
Research	Ouranos Consortium (QC)	Alain Bourque
	Balsillie School for International Affairs	Simon Dalby
	Wilfrid Laurier University	Robert McLeman (Geography)
Professional Associations	Canadian Society of Landscape Architects	Colleen Mercer-Clarke
Non-Profit	REEP Green Solutions	Mary Jane Patterson

	Sustainable Waterloo Region	Tova Davidson
	Climate Action Network Canada	TBD
Campus Collaborators	Water Institute	Roy Brouwer (Economics)
	Waterloo Institute for Sustainable Energy	Jatin Nathwani (Engineering & Environment)

The composition of this Advisory Board takes into account the representation of existing advisory bodies for the two sub-centres of IC3. The ICCA sub-centre has an established External Advisory Committee that is largely comprised of private sector members. The Polar Data Management Committee meets annually with CCIN and PDC management to review progress, form policy, and provide direction for future development. The IC3 Advisory Board will complement these existing bodies by strengthening representation from government and non-profit sectors (including professional associations) as well as establish links with other leading national and international research centres and institutes.

Intact sub-Centre on Climate Adaptation External Advisory Committee:

- Jean Andrey (Chair) – Dean, Faculty of Environment, University of Waterloo
- Patrick Barbeau – SVP, Claims, Intact Insurance
- Monika Federau – Senior Vice President and Chief Strategy Officer, Intact Financial Corporation
- Giselle Gagnon – Senior Vice President, Strategic Resources Group, Bentall Kennedy (Canada)
- Maryam Golnaraghi – international expert on climate change risk
- Veronica Scotti – President and CEO, Swiss Re Canada
- Douglas E. Turnbull – Vice-Chairman, Country Head, Canada, DBRS

CCIN/Polar Data Catalogue Advisory Committee:

- Gabrielle Alix, Julie Friddell, Chantel Ridsdale - CCIN/PDC, University of Waterloo
- Christine Barnard - Centre d'études nordiques, Université Laval
- Marcus Bermann, Christianne Lafferty, and Xiaohong Yang - Nunavut General Monitoring Plan, Indigenous & Northern Affairs Canada
- Leah Braithwaite, Alexandre Forest, Colline Gombault - ArcticNet
- Yves Crevier - Canadian Space Agency
- Kevin Fitzgibbons - NSERC
- David Hik - University of Alberta
- Sarah Kalhok, Jonathan Provost - Northern Contaminants Program, Indigenous & Northern Affairs Canada
- Scot Nickels - Inuit Tapiriit Kanatami

- Mathieu Ouellet – Department of Fisheries and Oceans
- Peter Pulsifer – National Snow and Ice Data Center (NSIDC)
- David Scott, Jennifer Sokol - Polar Knowledge Canada
- Anne Walker – Climate Research, Environment & Climate Change Canada
- Katherine Wilson - Marine & Ice Services, Environment & Climate Change Canada

3.3.3 Executive Director

A challenge to the evolution and growth of IC3 in its first 10 years has been limited human resource capacity, in particular the part-time nature of the Director position. Dr. Duguay received one course release per year during his tenure as Director (years 1-5). Dr. Scott received no course releases in year 6, one in years 7-8, and two in years 9-10 (see Table 4). Until very recently the Director has been able to dedicate only limited time to growing IC3's profile and developing relationships on and off-campus. Moving forward, it is proposed that the IC3 Executive Director be positioned to commit at least 50% of her/his time to the leadership of IC3.

The Executive Director will be a University regular faculty member and appointed for a term of up to five years by the VP Research, on the recommendation of the Governing Committee. This position may be extended or renewed by the VP Research with the support of the Governing Committee. The Executive Director will be responsible for the overall management of IC3, the preparation of its annual budget, supervision of Centre employees, development and execution of a strategic plan with input from the Governing Committee and Advisory Board, as well as preparation of an annual report to the Governing Committee and VP Research.

3.3.4 Staff

IC3 had a dedicated administrative assistant staff position for a short-term period in 2009-2011. When envisioning the second five-year term for the Centre in 2013, it was identified early that delivering on an expanded set of Centre activities and enhancing external profile would require increased personnel capacity. A full-time staff position (Associate Director) was created with a range of strategic and administrative responsibilities, including development of partnerships, facilitation of interdisciplinary research, management of human and financial resources, and coordination of internal and external communication. Hiring student interns for short-term contracts has been a key capacity-building solution (with experiential learning benefits) that has been utilized over years 6-10 to provide additional event coordination, communications/outreach, and research support.

Moving forward, it is proposed that the Executive Director be supported by two full-time staff positions, at minimum, in order to fulfill the responsibilities and objectives of a University-Funded Research Centre:

- A Managing Director (revised from Associate Director) will work with the Executive Director to support governance and strategic planning for IC3, including development of partnerships, facilitation of interdisciplinary research, management of human and financial resources, and coordination of internal and external communication. The position also has a strategic role in coordinating activities with IC3's knowledge mobilization sub-Centres (ICCA and CCIN-PDC). This position exists, but is currently vacant.
- An Administration and Knowledge Mobilization Assistant(s) will be the initial point of contact between IC3 and internal/external individuals and organizations. He/she will perform administrative functions (including finance, project reporting, and website development), organize events (workshops, seminars and public lectures), and support other internal/external communications and knowledge mobilization. This is a new position(s) that will need to be created through Human Resources.

3.4 Budget and Funding Request

IC3 has made significant achievements toward its original objectives (summarized in Table 1), fostering interdisciplinary research excellence on campus and off, a strong and growing record of federal collaboration, and national leadership in climate change education. As outlined in Table 4, IC3 has until very recently operated with modest financial resources and personnel capacity. IC3 was established in 2008 with a three-year initial investment of $100k/year (2008/09 to 2010/11 in Table 4). With Senate renewal of IC3 for a second five-year term and a new Director in 2013, an interim two-year funding arrangement ($100k/year) was established for 2013/14 to 2014/15. A new three-year investment from the Provost and Dean Environment began in 2015/16 (Table 4), which enabled IC3 to hire a full-time Associate Director, support the establishment and integration of ICCA and CCIN-PDC sub-Centres, build partnerships for an NCE application, provide limited seed funding for interdisciplinary projects, support Climate Students group activities (including Waterloo COP delegations), and provide increased Executive Director capacity.

The request to increase IC3's annual University-level funding to $355k/year (through investments by the Provost and Deans of participating Faculties - as shown in Table 4) would substantially increase the human resource capacity for IC3, including an increase to a minimum 50% time allocation of an Executive Director and 2.0 staff FTEs. This new capacity is essential if

the Centre is to compete nationally and internationally. Deans of all six Faculties have agreed to contribute to the new phase of IC3 based on proportional membership (collectively $75k/year, see Appendix B for letters of support) and the Provost is supportive of additional financial support of up to $280k/year (Table 4). It is proposed that this new University-funded Centre arrangement be for a five-year period and reviewed on the same five-year cycle as the Senate renewal process (the current term as a Senate approved research Centre ends May 2019). The budget plan for the initial five-year term is set out in Table 5.

Table 4. Summary of University Investment in IC3 and Proposed Funding

	Years 1-3 2008/09 to 2010/11	**Years 4-5** 2011/12 to 2012/13	**Years 6-7** 2013/14 to 2014/15	**Years 8-10** 2015/16 to 2017/18	**Proposed for** 2018/19 to 2022/23
Director Time	25% time	25% time	0-25% time	25-50% time	at least 50% time
Staff FTEs	0.5 to 1.0	0	1.0	2015-16: 1.25 2017-18: 0.5 (1)	2.0
University Funding • Provost • Deans	$50k/yr $50k/yr (2)	- $30k	$50k/yr $50k/yr (3)	$170k/yr (4) $30k/yr (3)	$280k/yr (5) $75k/yr (6) **Total $355/yr**

(1) Associate Director position is vacant, pending decision of SGRC and IC3 status
(2) Deans of Environment, Math, Science
(3) Dean of Environment
(4) Up to $240k in 2017/18
(5) Provost has agreed to support IC3 at an increased level
(6) All six Deans have agreed to provide support on a proportionate membership basis

Table 5. Proposed Financial Plan for IC3 as a University-Funded Centre

Expenses	Budget for Initial Five-Year Term
Executive Director	
• Stipend	$30,000
• Course releases [(1)]	$45,000
Managing Director Salary (US12)	$100,000
Administration and Knowledge Mobilization Assistant Salary	$65,000
Intern / Co-op Student(s)	$14,000
Salaries Sub-total	*$254,000*
Office Expenses	$7,000
Travel – Ex. Director and Staff	$20,000
Networking Events	$14,000
Seed Fund	$40,000
Climate Students Group	$5,000
Special Initiatives	
• UW Delegation to COP	$15,000
Total Expenses / Year	**$355,000**

(1) Based on normal course load of 4 per year.

3.5 Space

The provision of a 'gathering place' to foster collaboration was highlighted as a key function of Centres/Institutes and interdisciplinary programs by the Waterloo Committee on Senate-Approved Centres and Institutes report in 2011. The original IC3 proposal supported by the University outlined a cluster of IC3 and closely allied research project offices, two climate focused research labs, and a collaboration commons/meeting space. Due to space limitations, the vision of a 'climate cluster' to convene researchers, students, and other climate professionals located on campus has never been realized.

The potential to co-locate IC3, affiliated activities, and the MCC program in the ground-breaking Evolv1 building in the David Johnston Research and Technology Park represents a unique opportunity to create the envisioned gathering place for students and faculty to foster interdisciplinary research and develop exciting new partnerships with other Centres/Institutes and organizations located in Evolv1 (including the Waterloo Institute for Sustainable Energy, EY Canada, and Sustainable Waterloo Region – co-lead of the Region's Climate Action Plan).

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Appendix A: List of Current IC3 Members

	First Name	Last Name	Primary Position	Primary Department
1	**Jean**	**Andrey**	Dean, Environment	Geography and Environmental Management
2	**Derek**	**Armitage**	Associate Professor	Environment, Resources and Sustainability
3	**Elizabeth**	**Atkinson**	Senior Policy Manager	Natural Resources Canada
4	**Steven**	**Bednarski**	Associate Professor	History
5	**Peter**	**Berry**	Senior Policy Analyst and Science Advisor to the Director	Health Canada
6	**Joel**	**Blit**	Assistant Professor	Economics
7	**Sarah**	**Burch**	Associate Professor and Canada Research Chair	Geography and Environmental Management
8	**Angela**	**Carter**	Assistant Professor	Political Science
9	**Amelia**	**Clarke**	Associate Professor	School of Environment, Enterprise and Development
10	**David**	**Clausi**	Professor, Graduate Chair	Systems Design Engineering
11	**Neil**	**Craik**	Associate Professor and Director	School of Environment, Enterprise, and Development
12	**Simon**	**Dalby**	CIGI Chair in Political Economy of Climate Change	Balsillie School for International Affairs (BSIA) (WLU)
13	**Hans**	**De Sterck**	Professor	Applied Mathematics
14	**Peter**	**Deadman**	Associate Professor	Geography and Environmental Management
15	**Chris**	**Derksen**	Research Scientist	Cryosphere and Climate Interaction, Environment and Climate Change Canada
16	**Goretty**	**Dias**	Assistant Professor	School of Environment, Enterprise, and Development
17	**Brent**	**Doberstein**	Associate Professor	Geography and Environmental Management
18	**Michael**	**Drescher**	Assistant Professor	School of Planning

19	**Claude**	**Duguay**	Professor (IC3 Director, 2008-2012)	Geography and Environmental Management
20	**Susan**	**Elliott**	Professor	Geography and Environmental Management
21	**Elizabeth**	**English**	Associate Professor	School of Architecture
22	**Blair**	**Feltmate**	Associate Professor	School of Environment, Enterprise, and Development
23	**Chris**	**Fletcher**	Assistant Professor	Geography and Environmental Management
24	**Yulia**	**Gel**	Associate Professor	Statistics and Actuarial Science
25	**Roland**	**Hall**	Professor	Biology
26	**Daniel**	**Henstra**	Associate Professor	Political Science
27	**Thomas**	**Homer-Dixon**	Professor	Faculty of Environment
28	**Craig**	**Janes**	Professor/Director	School of Public Health and Health Systems
29	**Peter**	**Johnson**	Assistant Professor	Geography and Environmental Management
30	**Richard**	**Kelly**	Professor	Geography and Environmental Management
31	**Luna**	**Khirfan**	Associate Professor	School of Planning
32	**Kevin**	**Lamb**	Professor	Applied Mathematics
33	**Brendon**	**Larson**	Associate Professor	Environment, Resources and Sustainability
34	**Ellsworth**	**LeDrew**	University Professor	Geography and Environmental Management
35	**Yuri**	**Leonenko**	Assistant Professor	Physics and Astronomy
36	**Jonathan**	**Li**	Professor	Geography and Environmental Management
37	**Merrin**	**Macrae**	Associate Professor	Geography and Environmental Management
38	**Robert**	**McLeman**	Associate Professor	Department of Geography, Wilfrid Laurier University

39	**Colleen**	**Mercer Clarke**	Adjunct Lecturer	School of Planning
40	**Brian**	**Mills**	Applied Climatologist	Impacts & Adaptation Research, Environment and Climate Change Canada
41	**Carrie**	**Mitchell**	Assistant Professor	School of Planning
42	**Linda**	**Mortsch**	Adjunct faculty member	Faculty of Environment
43	**Maren**	**Oelbermann**	Associate Professor	Environment, Resources and Sustainability
44	**Paul**	**Parker**	Professor	Geography and Environmental Management
45	**Richard**	**Petrone**	Associate Professor	Geography and Environmental Management
46	**Francis**	**Poulin**	Assistant Professor	Applied Mathematics
47	**Jonathan**	**Price**	Professor	Geography and Environmental Management
48	**Derek**	**Robinson**	Assistant Professor	Geography and Environmental Management
49	**Ian**	**Rowlands**	Professor	Environment, Resources and Sustainability
50	**Horatiu**	**Rus**	Assistant Professor	Economics and Political Science
51	**Rebecca**	**Saari**	Assistant Professor	Civil and Environment Engineering
52	**Sherry**	**Schiff**	Professor, University Research Chair	Earth and Environmental Science
53	**Vanessa**	**Schweizer**	Assistant Professor	Knowledge Integration
54	**Daniel**	**Scott**	Associate Professor and University Research Chair (IC3 Director, 2013-2018)	Geography and Environmental Management
55	**Mark**	**Seasons**	Professor	School of Planning
56	**James**	**Sloan**	Professor, Atmospheric Applications of Chemistry and Physics	Earth and Environmental Sciences

57	**Marek**	**Stastna**	Associate Professor	Applied Mathematics
58	**Mike**	**Stone**	Professor	Geography and Environmental Management
59	**Larry**	**Swatuk**	Associate Professor, Director of International Development Program	School of Environment, Enterprise, and Development
60	**Jason**	**Thistlethwaite**	Assistant Professor	School of Environment, Enterprise, and Development
61	**Bryan**	**Tolson**	Associate Professor	Civil and Environment Engineering
62	**Michael**	**Waite**	Assistant Professor	Applied Mathematics
63	**Johanna**	**Wandel**	Associate Professor	Geography and Environmental Management
64	**Olaf**	**Weber**	Associate Professor; Export Development Canada Chair in Environmental Finance	School of Environment, Enterprise, and Development
65	**Byron**	**Williston**	Associate Professor	Philosophy, Wilfrid Laurier University
66	**Brent**	**Wolfe**	Professor and Graduate Coordinator	Geography and Environmental Studies, Wilfrid Laurier University
67	**Clarence**	**Woudsma**	Associate Professor and Director	School of Planning
68	**Steven**	**Young**	Associate Professor	School of Environment, Enterprise, and Development

Appendix B: Letters of Support

UNIVERSITY OF WATERLOO

FACULTY OF ENVIRONMENT | Office of the Dean
519-888-4567 | fax 519-746-2031
uwaterloo.ca/environment

March 15, 2018

Charmaine Dean
Vice-President Research
University of Waterloo

Dear Dr. Dean,

Re: Transition of the Interdisciplinary Research Centre on Climate Change (IC3) to a University-Funded Research Centre

I am writing to provide my enthusiastic support for IC3's transition to a University-Funded Research Centre.

The Interdisciplinary Centre on Climate Change was formed in 2008. Building on 25 years of climate change research and education on campus, IC3's genesis and evolution is part of Waterloo's growing emphasis on interdisciplinary and cross-Faculty research.

To generate broad academic value for its members and the University, IC3 focuses its efforts in four core areas: (1) Network Building, (2) Research Development, (3) Knowledge Mobilization, and (4) Education and Training (with programming offered through the Department of Geography and Environmental Management). IC3 has expanded its scope in recent years through the establishment in 2015 of a new Senate-approved sub-Centre, the Intact Centre on Climate Adaptation, as well as integration with the Canadian Cyrospheric Information Network / Polar Data Catalogue (CCIN/PDC) research group in 2016. In 2018, IC3 led a proposal for a NCE on climate-change adaptation. While unsuccessful, the associated networking has created strong linkages between IC3 and other researchers, universities, research centres and government agencies across Canada.

IC3 currently has 68 members, with representation from all six Faculties. The Deans have been briefed on the IC3's achievements and future plans and have agreed to provide total support of $75,000 per year (with contributions being prorated based on membership) to it as a university-funded centre. The Provost is also very supportive and has agreed to provide $280,000 per year to support IC3 as a university-funded centre.

The University of Waterloo has emerged as the leading Canadian university in climate change adaptation scholarship and knowledge mobilization, and is well positioned to emerge as an international leader in climate change policy and sustainability transitions, more broadly. IC3 has, and will continue to play, and integral role in this important area of research and citizen engagement.

Yours sincerely,

Jean Andrey
Dean
Faculty of Environment

200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

UNIVERSITY OF WATERLOO

OFFICE OF THE VICE-PRESIDENT ACADEMIC & PROVOST
519-888-4766
provost@uwaterloo.ca | uwaterloo.ca/provost

April 27, 2018

Bruce Muirhead
Associate Vice President, External Research and Professor of History
Office of Research
University of Waterloo

Dear Bruce,

Please use this letter as confirmation of my support of the Interdisciplinary Centre on Climate Change (IC3) becoming a university level institute. This arrangement will void the financial agreement made with Dean Andrey dated July 25, 2017.

The Centre will provide maximum support in the amount of $350 k/annum for an initial 3 year period to begin 2018/2019.

Sincerely,

D. George Dixon
Vice-President Academic & Provost

Copy: Jean Andrey

200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

UNIVERSITY OF WATERLOO

FACULTY OF APPLIED HEALTH SCIENCES
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April 25, 2018

Dr. Jean Andrey
Dean, Faculty of the Environment
University of Waterloo
200 University Ave West
Waterloo, ON N2L 3G1

Dear Dr. Andrey:

On behalf of the Faculty of Applied Health Sciences, I am writing to show my enthusiastic support for the establishment of the Interdisciplinary Center on Climate Change as a university funded centre.

This institute will harness the strengths of the UWaterloo community to help solve pressing issues in the area of climate change. This is a pressing societal issue and it is timely to tap into UWaterloo's history of innovation, creativity and expertise. Working across disciplines and in conjunction with researchers around the world, nationally, and regionally is the responsible route to take for us as an institution.

I believe that there is and will continue to be University-wide interest and engagement with the Interdisciplinary Centre on Climate Change including a growing interest for AHS.

Sincerely,

James W.E. Rush, PhD
Professor and Dean
Faculty of Applied Health Sciences

 200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

UNIVERSITY OF WATERLOO

FACULTY OF ARTS
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23 April 2018

Dr Jean Andrey

Dean, Faculty of Environment

Dear Dr Andrey:

I am writing this letter to confirm that the Faculty of Arts supports the decision taken by the Interdisciplinary Center on Climate Change to seek approval as a university-funded centre. The Faculty of Arts is an active participant in their research agenda, with five faculty members engaged with the Center. Given the timeliness and topicality of climate change research, and the University of Waterloo's longstanding commitment to and leadership of this area of research, it is appropriate that the Center becomes a more university-based center. This will hopefully facilitate greater engagement across the campus, and enable the Center to draw in more researchers.

Sincerely,

Douglas Peers

Dean, Faculty of Arts

cc. Dr Tara Collington, Acting Associate Dean Research

PAS 2401, 200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

UNIVERSITY OF WATERLOO

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April 23, 2018

TO: Dr. Charmaine Dean
Vice President, University Research, University of Waterloo

CC: Dr. Daniel Scott, Executive Director, Interdisciplinary Centre on Climate Change

RE: Transition of the Interdisciplinary Centre on Climate Change to a university-funded research centre

Dear Charmaine,

On behalf of the Faculty of Engineering, I am pleased to extend my enthusiastic support for the transition of the Interdisciplinary Centre on Climate Change (IC3) to a university-funded research centre.

Several faculty members in Engineering are actively engaged in climate change research. A number of them, including Professors David Clausi, Rebecca Saari and Bryan Tolson are already IC3 members. Their research addresses key climate change issues such as remote sensing, sea ice monitoring, environment, water resources, air pollution and greenhouse gases. The transition of IC3 to a university-funded centre will contribute to increased opportunities for interdisciplinary research.

Sincerely,

Anwar Hasan
Associate Dean, Research and External Partnerships
Faculty of Engineering

200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

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April 25, 2018

Bruce Muirhead
Associate Vice-President, External Research
EC5-3127

Dear Dr. Muirhead:

Established in 2008, the goal of the Interdisciplinary Centre on Climate Change (IC^3) is to assess the impacts of climate change for environmental and socio-economic systems and develop strategies for mitigation and adaptation. IC^3 currently has 67 members, from 16 Departments, across all six Faculties. Its members focus on understanding and modeling natural systems, assessing vulnerabilities and impacts of systems to extreme weather and climate change, and designing solutions that mitigate risks and enable transition to a more sustainable future. Based on the inventory conducted for UW's *Environmental Sustainability Report*, more researchers on campus are engaged in the scholarship of climate change than any other sustainability theme.

IC^3 provides national leadership on polar science. In 2015, the Canadian Cryospheric Information Network (CCIN) and the Polar Data Catalogue joined IC^3. CCIN, which developed over the past two decades through partnerships between UW and numerous government, university and private organizations, manages and makes available existing data on the cryosphere – sea, lake and river ice, snow, glaciers, and permafrost.

IC^3 has emerged as a national leader in knowledge mobilization. Of particular note are the flood-preparedness programs enabled by the Intact (sub)Centre on Climate Change and the Partners for Action project, both of which were made possible by gifts from the insurance sector totalling $5.35 million.

IC^3 has contributed to the development of academic programming and support of students. More specifically, IC^3 applied for UW to become an accredited delegate at the Conference of the Parties (COP) negotiations as part of the UNFCCC. This has enabled UW students, staff and faculty to participate as delegates in the past four COPs in Warsaw, Paris, Marrakesh and Bonn. Core members of the Centre also have been the driving force behind the creation of Canada's first Master of Climate Change Program and the recently launched Graduate Diploma in Climate Risk Management.

Finally, IC^3 has demonstrated that it can provide national leadership on major initiatives. It co-led a proposal for a Network of Centres of Excellence. While unsuccessful, the preparatory work has forged relationship between IC^3 and climate-change researchers, institutes and government agencies across the country – all of which will enable fruitful collaborations in the coming years.

 200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

As you no doubt can tell from the tone of my letter, I am fully supportive of IC^3 becoming a university-funded centre. As Dean of the Faculty of Environment, I am fully committed to supporting its success.

Sincerely,

Jean Andrey
Dean, Faculty of Environment

UNIVERSITY OF WATERLOO

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April 27, 2018

Dr. Bruce Muirhead
Associate Vice President Research
University of Waterloo
EC5 3127

Dear Dr. Muirhead,

I am writing to express my strong support for Interdisciplinary Centre on Climate Change -- and more specifically for its transition to a university-funded research centre. Faculty members in Mathematics have been involved with the Centre since its inception, collaborating with natural scientists in modeling atmospheric processes. Such cross-Faculty collaborations are critical to a deeper understanding of complex problems, such as climate change.

In the coming years and decades, climate change will remain one of society's greatest challenges, and the Interdisciplinary Centre on Climate Change is poised to play a leadership role in Canada in addressing this challenge.

Yours,

Stephen M. Watt, PhD, DSc *h.c.*, ICD.D
Dean, Faculty of Mathematics

MC, 200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

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April 25, 2018

Dr. Charmaine Dean
Vice-President University Research
University of Waterloo

Re: Interdisciplinary Centre on Climate Change

Dear Charmaine:

I write to express my strong support for the proposal to transition the Interdisciplinary Centre on Climate Change to a University Research Centre. Climate change is an increasingly important issue to modern society and the University of Waterloo has established a leadership role in climate changes science, adaptation and mitigation, which will be further strengthened by this proposal. The Faculty of Science will continue to contribute to this vital area of research and we are very pleased to support the Faculty of Environment in this initiative.

Sincerely,

Robert P. Lemieux, PhD
Dean of Science and Professor of Chemistry

200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

UNIVERSITY OF WATERLOO

To:	Senate Graduate & Research Council
From:	Eric Croiset, Professor and Department Head, Chemical Engineering
Date:	April 26, 2018
Subject:	Proposal for the creation the Waterloo Centre for Electrochemical Energy (WCEE)

Please accept the following for consideration at the next Senate Graduate and Research Council meeting. Specifically, please find attached the document entitles "Waterloo Centre for Electrochemical Energy", which contains the following:

- Letter of support from the Dean of Engineering and the Dean of Science
- Centre's Constitution and budget
- List of founding members and their CVs.

Item for Consideration
Creation of a new Centre (Faculty level Centre):
Waterloo Centre for Electrochemical Energy (WCEE)

Background/Context
Electrochemical energy systems are already ubiquitous in most people's daily life; one would think, for example, of batteries in mobile devices such as cell phone or computer tablets. We are also now at an exciting time in the energy sector where we will experience in our lifetime the shift from fossil fuel based energy systems in the power and transportation sectors to environmentally friendly technologies, many based on electrochemistry: energy production technologies like fuel cells or energy storage technologies like batteries are poised to experience unprecedented boom, leading to tremendous advances in technologies and to many jobs creation.

The University of Waterloo is particularly well positioned to take the lead nationally, and also internationally, in electrochemical energy R&D. Actually, UW is already a leader in this field with several internationally recognized experts in batteries and fuel cells, such as Linda Nazar in Chemistry, Zhongwei Chen in Chemical Engineering or Xianguo Li in Mechanical and Mechatronics Engineering. In addition to the above researchers, there are many others with excellent achievements and some, for the more junior ones, with tremendous potential.

The creation of WCEE will act as a catalyzer to boost R&D in electrochemical energy interdisciplinary research to an even higher level (both in terms of quality and quantity), to increase the visibility of the research carried out at UW in this domain and to attract high caliber graduate students and postdoctoral fellows.

WCEE fit superbly in several of the eighth themes of UW Strategic Plan (e.g. transformational research, experiential education, and likely entrepreneurship). Research carried out in WCEE is also directly relevant to most of the UW priority research areas in the Strategic Research Plan, for example Environment and Energy, Discovery and Design of Materials and Systems, Manufacturing and Devices, or Nanotechnology, with ramifications to Health and Well-Being.

At this time, researchers from two Faculties (Engineering and Sciences) have been identified (and have agreed) as founding members. However, WCEE membership is by no mean restricted to those founding

members and to the two Faculties mentioned above. In addition, it is intended that WCEE be self-funded through essentially industrial membership. Currently, enough fund has already been secured to ensure the hiring of a part-time WCEE manager for 5 years, and several companies have already expressed their strong interest in joining WCEE once it is officially established.

Consultation Process

The idea of a Centre on Electrochemical Energy started from discussions between Dr. Zhongwei Chen and myself.

We then approached twelve faculty members whom we know are heavily involved in this research area. Those faculty members are from two Faculties (Engineering and Sciences) and five Departments (Chemical Engineering, Chemistry, Civil and Environmental Engineering, Electrical and Computer Engineering, Mechanical and Mechatronics Engineering). All faculty members approached were very supportive of such Centre and agreed to be founding members of WCEE.

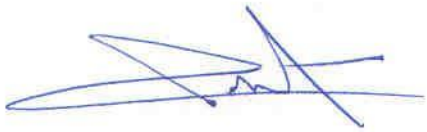
Finally, the Dean of Engineering and the Dean of Science were also approached to seek their support

Review and Approval Process

A first draft of the proposal was submitted to the Research Leader's Council to be discussed at their April 4, 2018 meeting, which I attended in person to present the proposed Centre. The main feedback from this meeting was that the proposal needs to be restructured along the lines of Policy 44 before submitting to SGRC. However, a motion to approve moving forward with WCEE, subject to governance policy of Policy 44 was carried.

The proposal was then restructured to follow as closely as possible Policy 44 and submitted to the Associate Vice-President, External Research for his feedback. The VP-ER's comments and corrections were taken into account, resulting in the final version of the proposal attached to this memo.

Yours sincerely,



Eric Croiset

UNIVERSITY OF WATERLOO

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MEMORANDUM

To: Charmaine Dean, Vice President, University Research

From: Pearl Sullivan, Dean of Engineering

cc: Eric Croiset, Professor and Chair, Department of Chemical Engineering

Date: January 15, 2018

Re: Establishment of the Waterloo Centre for Electrochemical Energy

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As Dean of Engineering, I am pleased to convey my full support for the creation of the Waterloo Centre for Electrochemical Energy (WCEE). Establishment of this Centre will bring together top researchers from the faculties of Engineering and Science in an area of critical strength and strategic priority for the University. The support of research in this field is also in the public interest of all Canadians, as issues associated with energy security and the environmental impacts of carbon-based energy are some of the most critical ones we face today.

In the broad field of Electrochemical Energy, the University of Waterloo has an international reputation, while in the specific area of electrochemical energy storage and production, we are home to some of the world's leading researchers. Proposed co-directors Professor Zhongwei Chen and Professor Linda Nazar are world-renown experts in electrochemical energy and have made transformative contributions in advanced energy materials, clean energy, solid state chemistry, electrochemistry, energy storage, and materials science. Other proposed founding members have thriving and innovative research programs in areas such as carbon capture, nanotechnology, fuel cells, green energy systems, hydrogen production and storage, and super capacitators. The establishment of the Centre will leverage these core areas of expertise by providing a platform for interdisciplinary collaboration, thereby stimulating innovative new approaches and ideas, and expanding the reach and impact of research output.

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Meeting the rapidly rising demand for energy that is accompanying global population growth, will require transformative changes in the way we generate, transmit, store, and use energy. The outcomes of research facilitated through the WCEE will generate an array of technologies for Canadian industries and governments to address this critical challenge. Applications of WCEE research will include the development of cleaner and more efficient energy technologies for portable electronics, transportation, portable and stationary backup power supplies, and smart grid systems. The Centre will also attract significant attention from industries interested in new electrochemical technologies, such as industrial battery manufacturing and clean tech companies. The WCEE will facilitate partnerships between such companies, along with other universities, and non-profit organizations seeking to work towards large-scale solutions for energy-related scientific and technological challenges.

WCEE will be housed in the Faculty of Engineering, and funding in this Centre will be provided by Professor Chen's research funds for the first few years. We anticipate other industry partnerships will sustain the operation in the longer term.

Establishment of the WCEE will bolster the University's standing as a leader in energy research, and enhance progress in two key strategic areas: energy generation and the creation of battery technologies (University of Waterloo Strategic Research Plan). This will in turn raise Canada's profile in the energy research community, further attracting talent, investment, and resources in this critical area of research.

Sincerely,

Pearl Sullivan

200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

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January 12, 2018

Dr. Charmaine Dean
Vice-President University Research
University of Waterloo

Re: Proposed Waterloo Center for Electrochemical Energy (WCEE)

Dear Charmaine:

I write to express my strong support for the proposed *Waterloo Centre for Electrochemical Energy* to be under the direction of Profs. Zhongwei Chen (Chemical Engineering) and Linda Nazar (Chemistry). This area of research is of significant strategic importance to the Faculty of Science, and the proposed Centre will contribute to further strengthening Waterloo's position nationally and internationally as leader in electrochemical energy research and development.

Sincerely,

Robert P. Lemieux, PhD
Dean of Science and Professor of Chemistry

200 UNIVERSITY AVENUE WEST, WATERLOO, ON, CANADA N2L 3G1

Waterloo Center for Electrochemical Energy (WCEE) Constitution

1. Overview

The goal of WCEE is to foster collaborative and interdisciplinary research on electrochemical energy storage and conversion systems in order to assist the Canadian industry and governments in the development of cleaner, more efficient and environmentally friendly energy technologies for portable electronics, transportation, portable and stationary backup power supply, smart grid systems, and to protect and clean our air, water, and soil while improving the competitiveness of Canadian industry and the standard of living of Canadians. WCEE will become an epicenter of electrochemical energy storage research development in Canada, attracting industrial battery manufacturing to Ontario, and cleantech companies relying on new electrochemical technologies. Not only will Canadians reap the environmental and technological benefits but will also benefit from significant expected job creation and the training of highly qualified personnel within Canada.

Our strengths are in the following areas:

- Batteries
- Fuel Cells
- Supercapacitors
- Hydrogen Production/Storage

2. Governance

2.1. Objectives of the Center

The general purpose of the Center is to promote the goals of the University of Waterloo, and in particular:

(i) to make Waterloo a world leader in electrochemical energy systems;

(ii) to foster development of transformational concepts and accelerate the translation of next generation electrochemical energy technology concepts from the lab to pre-commercial scale via device prototyping;

(iii) to build strategic relationships with industries, institutes and national laboratories nationally and internationally;

(iv) to acquire major research grants through joint proposals that would include support from CFI, Create, ORF, Strategic Network and industry partners, among others, to support world-class transformal research; and

(v) to seek outcomes that enhance global energy security, maintain technological leadership, and improve high-tech manufacturing activity in Ontario and Canada through innovative R&D.

2.2. Governing Body:

The central Governing Body is the Board of Directors. It is assisted by an Executive Committee and an Industrial Advisory Board.

Board of Directors

The Board of Directors oversees the activity of the Center and approves decisions, reports, and the financial statements of the Centre.

The composition is

- Dean of Engineering or delegate and the Dean of Science or delegate, as well as any other Dean or delegate should WCEE expand into other Faculties. They will be added as required.
- Chairs of the Departments which have 2 or more faculty as members of WCEE
- One representative from the Office of Research, level TBD
- Directors (two co-Directors) of the Center
- One industrial representative, elected by the Industrial Advisory Board for two years.
- Two representatives from the Regular members, nominated/elected for two years.

The Dean of Engineering or his/her delegate chairs the Board of Directors.

Executive Committee

The role of the Executive Committee is to promote the image of WCEE. The Executive Committee also sets the agenda for the Annual General Meeting and is responsible for preparing the financial statement. As well, it will oversee, as appropriate, the general operations of the WCEE on an annual basis.

The composition is

- Directors (Two co-Directors) of the Center
- Two regular members, nominated/elected for two years

Industrial Advisory Board

In addition to informal discussions with Center members, WCEE's industrial and governmental affiliates have the opportunity to contribute their expertise to the development of the Center through the Industrial Advisory Board. Its composition is:

- One member from each industrial and governmental affiliate, TBD
- Directors (Two co-Directors) of the Center

- One regular member, elected for two years

It is the goal of the Industrial Advisory Board to ensure that the scientific work undertaken by the Center, while also providing a sound pedagogical experience for students and a sound research result for faculty, results in a benefit to the Center's industrial affiliates.

2.3. Annual General Meeting

The Board of Directors meets once a year, at the Annual General Meeting (AGM).

The AGM is open to all members of the Centre.

The agenda is to be distributed to the membership at least two weeks prior to the date of the AGM.

2.4. Responsibilities of the Board of Directors

The Board of Directors has the authority to execute and monitor the affairs of WCEE, subject to all applicable University policies, procedures and guidelines. This includes the ability to:

- Enact rules and regulations for membership of the Board of Directors, Executive Committee and Industrial Advisory Board;
- Recommend appointment of the co-Directors;
- Recommend appointment and removal of staff;
- Appoint and remove Members, and establish categories of membership and associated fees;
- Plan and implement WCEE's development;
- Establish processes to manage and monitor WCEE's financial affairs;
- Establish and enforce rules and regulations governing WCEE's activities, provided such rules and regulations are consistent with the University policies, procedures and guidelines; and
- Establish such committees as it deems necessary to discharge its responsibilities.

2.5. Directors

WCEE is under the leadership of two co-Directors, one co-Director in charge of Fundamentals of Electrochemical Energy (likely from the Faculty of Science), while the other co-Director oversees the Engineering and Application of Electrochemical Energy Systems (likely from the Faculty of Engineering).

Both co-Directors must hold a University of Waterloo faculty appointment.

Appointment of Directors

The co-Directors are appointed by the Dean of Engineering or his/her delegate on the recommendation of the Board of Directors. In making its recommendation, the Board of Directors seeks the views of WCEE's members, inviting them to submit nominations. In the event of a unanimous recommendation the Board of Directors will convey the choice to the Dean of Engineering or his/her delegate, who will then submit the choice for Director(s) to the membership for ratification by secret ballot. If more than one nomination per position is received, an election will be held amongst the members of the Center to select a Director. Voting will be by secret mail ballot.

The term of office for WCEE co-Directors is four years, renewable for a second term of four years. Directors would not be expected to serve for more than two terms, after which he/she must be off the board for a minimum of four years (one full term) before being eligible for reappointment.

In the event of a co-Director's absence for any prolonged period, arrangements should be made for the Dean of Engineering or his/her delegate, on the recommendation of the Board of Directors, to appoint an Acting Director for a period of no more than one year.

If a co-Director's position becomes unexpectedly vacant, the Dean of Engineering or his/her delegate will appoint, after appropriate consultation, an interim Director if needed (the other co-Director could temporarily occupy both co-Directorships), and initiate the process of filling the vacancy.

Removal of the Director(s)

Directors may be removed from office by the Dean of Engineering acting on the advice of the Board of Directors.

If a simple majority of members of the Center present written requests to the Dean of Engineering or his/her delegate calling for the removal of one or both co-Director(s), the Dean of Engineering or his/her delegate must investigate the complaint and notify the Board of Directors of his/her action. If he/she concludes that the welfare of the Center requires the removal of one or both co-Director(s), he/she must consult with the Board of Directors and consider recommending such action. Before recommending removal of one or both co-Director(s), the Dean of Engineering or his/her delegate shall inform the Directors of his/her decision and reasons for it. The Directors have the right to state their case to the Board of Directors and the members of the Center.

A Director may only be removed from office for cause, which is to be understood in relation to the duties of the Director as described herein. Cause for removal includes negligence, incompetence, unprofessional conduct, and inability to maintain the confidence of the Members.

Duties of the Directors

The co-Directors are responsible for:

- Overseeing WCEE's operations and managing its budget;
- Supervising staff members;
- Establishing working groups or committees to provide appropriate guidance and advice in support of their responsibilities;
- Preparing an Annual Report to the Board of Directors;
- Discharging all responsibilities set out in the constitution, and as directed by the Board of Directors;
- To contact and visit clients (existing and potential).

The Directors will also have signing authority on finance. Two signatures will be required for financial commitments. Furthermore, the Directors shall delegate tasks to Center members to ensure an equitable distribution of the work of running the Center.

The Directors' performance is reviewed annually by the Dean of Engineering or his/her delegate. With the knowledge of the Directors, the Dean of Engineering or his/her delegate will seek confidential input from the Board of Directors, Executive Committee, Industrial Advisory Board, Members of WCEE, and its staff by any means s/he deems appropriate.

3. Membership and Appointments

3.1. Membership types

There are three types of membership:

- Regular membership
- Associate membership
- Affiliate membership

Regular and Associate memberships:

Regular membership in WCEE is extended to full-time faculty members at the University of Waterloo with active research programs in electrochemical energy systems.

Associate membership is for faculty members from other universities than the University of Waterloo.

The primary benefit for the academic members is to foster collaboration between members, particularly in multidisciplinary projects.

Affiliate membership:

Affiliate membership is extended to industry and government agencies. The program involves meetings at which both presentations and discussions will take place with the dual primary objectives of informing the affiliate members about the results of research in progress at WCEE and finding out about the affiliate members' basic research needs.

Affiliating companies are required to pay WCEE an annual membership fee of $1,000.

Benefits for Affiliate members include the following:

1) membership on the Industrial Advisory Board.
2) the right to send personnel to annual seminars reviewing the research activities of faculty members of WCEE.
3) priority access to WCEE facilities and services available on fee-for-service basis.
4) obtaining on a regular basis preprints of publications of faculty members of WCEE as soon as those become available.

All types of memberships are valid for a period of five years, after which they will be re-evaluated for renewal.

3.2. Member Appointment

Decisions regarding eligibility and renewal of individuals are made by the Executive Committee. New and renewed members have to be recorded in the Annual Report presented at the AGM.

4. Research/Educational Component and Participation in Academic Programs

4.1. Research/Educational Component

WCEE supports postdoctoral, graduate and undergraduate student education at the University of Waterloo to explore novel, high-reward research topics while seeding new collaborations in research and education that raise the profile of WCEE in ways that significantly increase the prospects for future extramural support. The professors will support the students through grants such as NSERC CRD, Strategic, Network and industry contract programs.

Students, postdoctoral fellows and visitors will have the opportunity to present their research at WCEE organized events.

4.2. Participation in Academic Programs

The main objective of WCEE is to serve as a catalyst for collaborations that may eventually develop into academic programs in departments, schools and/or Faculties, but WCEE understands that it has no autonomy (and no desire) to administer for-credit academic courses or programs leading to University of Waterloo degrees or diplomas.

5. Financial Support Contract Research and Initial Budget

5.1. Financial support

The Center will be a self-supporting organization whose financial administration is kept separate from that of the research operating grants of the individual members. As a result, services to academic members must be paid for, either indirectly or directly.

Indirect support comes from general income to WCEE from such sources as company affiliation fees or donations, NSERC infrastructure grants and equipment grants. It is not our intention to use WCEE general income to support specific research projects. Such monies should continue to come from individual researchers. WCEE funds will be used to maintain and operate research equipment, carry out liaison with industry, bring visiting researchers to this campus for shorter or extended stays and provide seed money for enterprises like special conferences or short courses.

5.2. Contract Research and Research Grant

The administration of contract research undertaken by a university researcher in cooperation with an industrial firm lies outside the jurisdiction of WCEE. Such exchanges are administrated by the Waterloo Office of Research acting on behalf of the individual member or members.

5.3. Initial Budget

Professor Zhongwei Chen has secured funding from industry contracts to support one manager assistant for 5 years. The manager assistant will contribute 30% of his/her time as in-kind to assist the Directors for WCEE operation. Professor Chen has contacted several companies about memberships and donations, and these companies have expressed strong interest. The following is a proposed five-year budget for WCEE.

Year	2018-2019	2020-2021	2021-2022	2022-2023	2023-2024
Projected Income					
Industry Memberships	10,000	20,000	20,000	20,000	20,000
Donations	10,000	25,000	30,000	30,000	30,000
TOTAL Income	20,000	45,000	50,000	50,000	50,000
Projected Expenses					
Workshop	19,000	24,000	29,000	29,000	29,000
Salaries for Manager Assistant (part-time)	0	20,000	20,000	20,000	20,000
Office Supplies/postage	1,000	1,000	1,000	1,000	1,000
TOTAL Expenses	20,000	45,000	50,000	50,000	50,000
Balances	0	0	0	0	0

6. Amendments to the Constitution

No constitution can foresee all situations which might arise during the evolution of WCEE. Amendments to the Constitution will be made if approved by a simple majority of Center members and will be submitted at the annual meeting to the Board of Directors for final approval.

7. Academic Members and their Research Interests in Electrochemical Energy

Proposed Co-Directors: Zhongwei Chen (ChE); Linda Nazar (ChEM)

Dr. Chen as Co-Director in the Engineering and Application of Electrochemical Energy;

Dr. Nazar as Co-Director in Fundamentals of Electrochemical Energy

Proposed Founding Members:
Zhongwei Chen (ChE); Eric Croiset (ChE); Bo Cui (ECE); Michael Fowler (ChE); Jeff Gostick (ChE); Feridun Hamdullahpur (MME); Hyung-Sool Lee (CEE); Xianguo Li (MME); Linda Nazar (ChEM); Mike Pope (ChE); Mark Pritzker (ChE); Luis Ricardez Sandoval (ChE); Rodney Smith (ChEM); Aiping Yu (ChE);

Zhongwei Chen (ChE)
Dr. Zhongwei Chen is Canada Research Chair Professor in Advanced Materials for Clean Energy at the University of Waterloo. His research interests are in the development of advanced energy materials and electrodes for metal-air batteries, lithium-ion batteries and fuel cells. He has published 1 book, 7 book chapters and more than 160 peer reviewed journal articles with over 10,000 citations with H-index 48 (Google Scholar). He is also listed as inventor on 15 US/international patents, with several licensed to companies in USA and Canada. Over the last seven years, he has secured roughly $8.0 million as a principal investigator, largely through NSERC RTI, CRD, and APC programs, and has helped secure an additional $11 million through large grants to the US Department of Energy and NSERC APC programs. These activities are currently supported by a large and highly integrated team, comprising 15 postdoctoral fellows and 28 graduate students. In addition, Prof. Chen has already trained more than 40 others through his research program, totaling 76 highly qualified personnel in all. He was recipient of was recipient of the 2016 E.W.R Steacie Memorial Fellowship and elected as the member of the Royal Society of Canada's College of New Scholars, Artists and Scientists in 2016, which followed shortly upon several other prestigious honors, including the Ontario Early Researcher Award, an NSERC Discovery Supplement Award, the Distinguished Performance and Research Excellence Awards from the University of Waterloo.

Linda Nazar (ChEM)
Dr. Nazar was educated at the University of British Columbia and the University of Toronto, receiving her undergraduate degree in chemistry and her Ph.D. degree in materials chemistry respectively. She then joined Exxon Corporate Research in NJ, USA, where she was an Exxon Postdoctoral Fellow. In 1987 she joined the faculty at the University of Waterloo, where she initiated her independent academic career. She was promoted to full professor in 2000 and established the Laboratory for Electrochemical Energy Materials. She has contributed to building the Waterloo Institute for

nanotechnology program, and the shaping of the WIN, its research programs and facilities, and the recruitment of its research staff. Dr. Nazar has achieved international recognition as a leader in the areas of solid state chemistry, electrochemistry, energy storage and materials science. She has co-authored over 170 publications, 8 patents, and over 300 contributed international conference papers. Dr. Nazar has also presented her work in over 150 invited distinguished lectures, colloquia and seminars around the globe. She is listed in the 2014 Highly Cited Research List (Thomson-Reuters) and in their 2014 World's Most Influential Scientific Minds. Dr. Nazar is the recipient of several academic and professional honours and awards, including the Electrochemical Society Battery Division Research Award (2009), the International Battery Association award (2011), the IUPAC Distinguished Women in Chemistry/Chemical Engineering award (2011), the August-Wilhelm-von-Hofman Lecture award (German Chemical Society, 2013), and was the 2010 Moore Distinguished Scholar at the California Institute of Technology. She was also elected to the Royal Society of Canada (2012).

Eric Croiset (ChE)

Eric Croiset is a Professor and the current Chair of the Chemical Engineering Department at the University of Waterloo. His main research interests include CO_2 capture from large point sources, solid oxide fuel cell (SOFC), syngas/hydrogen production, and reaction engineering. Of particular interest to WCEE is his work on SOFC where he is working on reducing the cost and improving the long term operation of SOFC. To that effect, he is developing low temperature metal-supported SOFC. He also has a particular interest on developing systems where practical fuels (such as syngas or natural gas) can be used while minimizing the problem of carbon deposition on the anode. He recently embarked in a research program on CO_2 reduction in Solid Oxide Electrolysis Cells. His approach is to combine experimental and modeling studies. Dr. Croiset has published more than 100 research papers resulting in an h-index of 33 (Google Scholar). He has also been a long standing member of the Electrochemical Society.

Bo Cui (ECE)

Dr. Cui is a Professor in the Department of Electrical and Computer Engineering at the University of Waterloo. Dr. Cui leads the Waterloo Nanofabrication Group whose research is focused on nano- and microstructure fabrication using Nano-Imprint Lithography (NIL), electron beam lithography, thin film deposition and etching, with applications in biomedical, nanoelectric and batteries. Dr. Cui won the 2014 Engineering Research Excellence Award.

Michael Fowler (ChE)

Professor Fowler is a Professor in the Department of Chemical Engineering at the University of Waterloo. Professor Fowler's primary research interests are the design and performance of fuel cell stacks and systems. Fuel cells are an emerging technology, and there will continue to be extensive research (especially applied research) over the next 20 years. At this stage in the development of fuel cells, long term test data is generally not available, or new designs are so radically advanced that previous data or experience are of limited use. Failure mode work that has been performed is generally preliminarily in nature, or not quantitative. Related fields, including accelerated testing, conductive

polymer blends, hydrogen production and distribution, greener energy system, life cycle analysis are also part of Professor Fowler's research interests.

Jeff Gostick (ChE)
Jeff Gostick is an Associate Professor in the Chemical engineering Department at the University of Waterloo. His research interest is on the characterization and modelling of transport phenomena in porous materials, particularly 'atypical' media such as electrodes, fibrous membrane or compressible materials. He has published more than 30 papers, the majority in the field of transport phenomena in porous electrodes in fuel cells.

Feridun Hamdullahpur (MME)
Feridun Hamdullahpur is a Professor of Mechanical and Mechatronics Engineering at UW. His teaching and research interests are in the areas of flow and thermo-kinetic modeling energy conversion systems specifically for bio-mass gasification and Fuel cell systems. His current research interest involves integration of methanol reforming into reformate gas-fueled fuel cell system. Dr. Hamdullahpur received his Bachelor's and Master's degrees in Mechanical Engineering at the Technical University of Istanbul, Turkey, and a Ph.D. in Chemical Engineering at the Technical University of Nova Scotia in Halifax, Canada. Dr. Hamdullahpur has been an active researcher and supervisor. He has published over 160 scientific and technical articles and supervised over 40 graduate students.

Hyung-Sool Lee (CEE)
Dr. Lee is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of Waterloo. His research topics include production of bio-energy (electricity, H_2, and CH_4) and bio-chemicals from biomass nutrients recovery from organic waste and waste water, thermodynamic/kinetic analyses on microbial metabolisms in engineered and natural systems, anaerobic metabolism of bacteria and archaea, extracellular electron transfer, biofilm conductivity, microbial electrochemical cells, bio-energy production, microbial ecology in engineered biological systems, bioelectrochemistry, and thermodynamic/kinetic analysis on microbial metabolisms. He is a current funding holder of several governmental and industrial fundings, from NSERC, MEDI, CFI, and GE. He is the guest editor to Bioresource Technology: Special Issue "Microbial Fuel Cells", 2015. He was the session organizer and program chair for "Sustainable Wastewater Treatment" American Chemical Society, Boston, August 2015.

Xianguo Li (MME)
Xianguo Li is a Mechanical and Mechatronics Engineering Professor at the University of Waterloo. Professor Li's main research interests and activities are in the area of thermal fluid/science, including energy systems and energy storage, various energy conversion devices, propulsion and power generation systems, aerosol generation and applications, and transportation fuel cell and battery systems. These research projects involve thermodynamics, fluid dynamics, hydrodynamic stability, multiphase flow, heat and mass transfer, liquid atomization and sprays, combustion, power generation and propulsion systems. Professor Li is the Founding Editor-in-Chief of the *International Journal of Green Energy*, which established the International Green Energy Conference series and

launched the annual review series Progress in Green Energy. He is currently serving on the editorial board of dozens of international scientific/technical journals, book series on fuel cells and energy systems, as well as an encyclopedia on Energy Engineering and Technology. Professor Li is a fellow of the Engineering Institute of Canada and a fellow of the Canadian Society for Mechanical Engineering (CSME), and serves as the CSME Division Chair for the Advanced Energy Systems technical division.

Mike Pope (ChE)
Dr. Pope is an Assistant Professor in the Department of Chemical Engineering at the University of Waterloo. His group is developing new materials and bottom-up processing strategies to fabricate improved, typically nanocomposite, device components in order to advance technologies in areas such as electrochemical energy storage, energy generation, sensing and separations. They use methods in interfacial engineering to direct the assembly of nanocomposites from a variety of nanomaterial building blocks and molecular precursors such as polymers, surfactants and ionic liquids. Some current research thrusts are: Graphene production and post-processing techniques, directed assembly of 2D nanomaterials at the air-water interface, bottom-up assembly approaches for energy storage, sensing and electrocatalysis.

Mark Pritzker (ChE)
Professor Pritzker is a Professor in the Department of Chemical Engineering at the University of Waterloo. Professor Pritzker's main research interests include, electrochemical engineering, electrochemical techniques for fabrication of nanostructures, leaching, adsorption and ion exchange processes, metal and alloy electrodeposition, proton exchange membrane fuel cell (PEMFC) and solid oxide fuel cell (SOFC) experimentation and modelling, process modelling, simulation and optimization of oriented strand board manufacturing.

Luis Ricardez Sandoval (ChE)
Dr. Sandoval is an assistant Professor in the Department of Chemical Engineering at the University of Waterloo. Major research topics in Dr Sandoval's group include integration of design and control, multiscale modelling and control, process improvement in CO_2 capture and gasification systems, The research developed by Dr. Ricardez-Sandoval has been generously supported by a network of collaborators from the federal government, i.e. Canada Foundation for Innovation (CFI), Natural Sciences and Engineering Research Council of Canada (NSERC), Mitacs, and CanmetENERGY, which is a part of Natural Resources Canada; the provincial government of Ontario, i.e. Ontario Centres of Excellence (OCE), Ontario Research Fund (ORF), and the Early Researchers Award (ERA) granted by the Ministry of Research and Innovation; and private companies in the analytical services and manufacturing sectors.

Rodney D. L. Smith (ChEM)
Assistant Professor in Chemistry. Rodney Smith's research involves the study of electrocatalysts for use in sustainable energy storage systems. His research examines the chemistry of electrode surfaces, measures electron transfer kinetics and probes

electrochemical reaction dynamics in an effort to guide the design and fabrication of solid-state electrocatalysts.

Aiping Yu (ChE)

Dr. Yu is an Associate Professor in the Department of Chemical Engineering at the University of Waterloo. Her research interests mainly cover simulation and optimization of oriented strand board manufacturing, nanomaterials synthesis and processing (nanotubes/nanowire/nanopalatets/ nanoparticle), functionalization of carbon nanotube and graphene, nanomaterials for engineering nanocomposites, nanomaterials for solar cell, nanomaterials for sensor/actuator. She is a recipient of Ontario Early Research Award in 2014. Her book of Electrochemical Supercapacitors for Energy Storage and Delivery: Fundamentals and Applications from Dr. Yu has received excellent review from the "IEEE Electrical Insulation" magazine. Her graphene sponge review paper is featured as “#1 downloaded papers” in journal of Energy and Environmental Science. Dr. Yu is the guest editor for the journal Applied Energy, focusing on special issues related to Electrochemical Supercapacitors for Energy Storage and Conversion, Advanced Materials, Technologies and Applications. Dr. Yu currently holds the position of Topical Editor for the journal of Electrochemical Energy Technology.

The complete list of Curriculum Vitae for Academic Members can be found here.

Graduate Studies
Program Revision Template

Prior to form submission, review the content revision instructions and information regarding major/minor modifications. For questions about the form submission, contact Trevor Clews, Graduate Studies Office.

Faculty: Arts

Program: Master of Fine Arts (MFA) in Studio Art

Program contact name(s): Tara Cooper, Sharon Dahmer

Form completed by: Tara Cooper, Sharon Dahmer, Cora Cluett

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).

Fine Arts would like to make the following changes:

1. Lower the minimum average for admission from 80% to 75%.
2. Lower the number of references required for admission from 3 to 2 and change the type of references required from "academic" to "academic and/or professional".
3. Update the current "Fields" (areas of research).
4. Input name change from Keith and Win Shantz Summer Internship to Keith and Win Shantz International Scholarship.

Is this a major modification to the program? Yes

Rationale for change(s):

We reviewed 20 MFA programs across Canada and discovered that UW Fine Arts is not in-line with some of the requirements in comparison with our competitors. In order to stay competitive and avoid deterrents that might discourage applicants from choosing Waterloo, we would like to make the changes as stated above.

1. In our admission process, the portfolio carries the most weight. Students must be strong academically, but ultimately the artwork produced within their studio is paramount and is what constitutes their thesis. In the past few years, we have admitted several students that fell within a B+ average based on the strength of their portfolios. It is also confusing for applicants as this percentage is based on their final 20 credits as opposed to an overall average—thus potential applicants might not apply due to how this requirement is currently stipulated (even though he or she might actually meet the 80% requirement). Moreover, we are the only MFA program in Canada out of the 20 that we looked at that have this stipulation. Most do not qualify an average, or state "B". There are only 3 programs that require a "B+" (Western, UBC and U of T), but this was the highest average indicated in the country and there wasn't a single program that put a numeric value to the average, or required an "A" average.
2. Again, the majority of programs (i.e. more than 50%) require only two academic references.
3. The current "Fields" (areas of research) are extremely out-of-date and requires an update to reflect current disciplines/fields within contemporary art practice as well as the research areas of new hires. Our primary concern is that the current list looks dated and does not match what our graduate students are making as part of their thesis research. We have combined Drawing and Painting into one field as these two fields are commonly listed together and are inter-related pedagogically. Digital Media replaces Electronic Imaging, as a more contemporary term, and encompasses a broad range of media based studio production – for example, video, photography, sound, animation, interactive artworks, wearable media.

Expanded Media effectively covers Performance Art and Social Practice. Print Media is the most commonly used descriptor for printmaking.

4. An additional change under Term 3 of the MFA from Keith and Win Shantz Summer Internship to the Keith and Win Shantz International Research Scholarship. This change was made officially (approved 2016 and is on our department website) to ease the of travel and avoid potential 'red tape' for our students crossing international borders. For example, several of our students have been turned away at borders (U.S.A. and the U.K.) for use of the term 'internship' which is flagged and implies working within the country they are attempting to enter and taking jobs away from nationals.

Proposed effective date: Term: Fall Year: 2018

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-fine-arts/master-fine-arts-mfa-studio-art

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
MASTER OF FINE ARTS (MFA) IN STUDIO ART **Fields (areas of research)** • Drawing • ~~Electronic Imaging~~ • Painting • Sculpture **Program information** • **Admit term(s)** o Fall • **Delivery mode** o On-campus • **Length of program** o Full-time students will require 5 consecutive terms to complete the program. It is expected and required that students reside in the Waterloo area during their period of active enrollment and make regular use of the studios provided. o The part-time option takes a minimum of 6 terms to complete; the maximum is 15 terms. • **Program type** o Master's	**MASTER OF FINE ARTS (MFA) IN STUDIO ART** **Fields (areas of research)** • Drawing and Painting • Digital Media • Expanded Media • Print Media • Sculpture **Program information** • **Admit term(s)** o Fall • **Delivery mode** o On-campus • **Length of program** o Full-time students will require 5 consecutive terms to complete the program. It is expected and required that students reside in the Waterloo area during their period of active enrollment and make regular use of the studios provided. o The part-time option takes a minimum of 6 terms to complete; the maximum is 15 terms. • **Program type** o Master's

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
o Research • **Registration option(s)** o Full-time o Part-time • **Study option(s)** o Thesis **Admission requirements** • **Minimum requirements** o Applications will be considered from those who have completed a four-year Honours Bachelor of Arts (BA) or Bachelor of Fine Arts (BFA) or equivalent with an ~~80~~% average or better. o Applicants will be required to complete an application form, provide 20 images of recent work, and a short statement of intention. o Applicants without a degree or formal academic qualifications, but showing exceptional promise, may be recommended for admission only in exceptional circumstances. Such prospective applicants should contact the Fine Arts Graduate Advisor prior to submitting their application. • **Application materials** o Portfolio o Résumé o Supplementary information form o Transcript(s) • **References** o Number of references: ~~3~~ o Type of references: academic • **English language proficiency (ELP) (if applicable)** **Degree requirements** **Thesis option:** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** o In their first term, candidates will carry out work in their chosen area of	o Research • **Registration option(s)** o Full-time o Part-time • **Study option(s)** o Thesis **Admission requirements** • **Minimum requirements** o Applications will be considered from those who have completed a four-year Honours Bachelor of Arts (BA) or Bachelor of Fine Arts (BFA) or equivalent with an 75% average or better. o Applicants will be required to complete an application form, provide 20 images of recent work, and a short statement of intention. o Applicants without a degree or formal academic qualifications, but showing exceptional promise, may be recommended for admission only in exceptional circumstances. Such prospective applicants should contact the Fine Arts Graduate Advisor prior to submitting their application. • **Application materials** o Portfolio o Résumé o Supplementary information form o Transcript(s) • **References** o Number of references: 2 o Type of references: academic and/or professional • **English language proficiency (ELP) (if applicable)** **Degree requirements** **Thesis option:** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses**

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
specialization in FINE 690 Graduate Studio 1 and will also complete at least 1 of 3 required elective courses. In addition, candidates will take the first of a series of seminar courses, 1 of which is required during each Fall and Winter term. These courses will deal with the issues which concern contemporary artists and critics. At the end of the first term, a committee of two faculty members will be selected to oversee the candidate's studio progress toward thesis completion. o Any candidate receiving a grade of less than 75% in one or more classes may be required to withdraw from the program. o Following is a term-by-term breakdown of the course requirements: o Term One (Fall) ▪ FINE 690 Graduate Studio (1.00 credit) ▪ FINE 680 Issues in Contemporary Art 1 (0.50 credit) ▪ Elective (0.50 credit) ▪ Pedagogy Elective (0.50 credit) ▪ Teaching Assistantship (TA) with one full time faculty member o Term Two (Winter) ▪ FINE 691 Graduate Studio 2 (1.00 credit) ▪ FINE 681 Issues in Contemporary Art 2 (0.50 credit) ▪ Elective (0.50 credit) ▪ Teaching Assistantship (TA) with one full time faculty member o Term Three (Spring) ▪ FINE 692 Graduate Summer Studio (1.00 credit) ▪ The Keith and Win Shantz Summer Internship program comprises the first half of this term. This involves six weeks, at thirty hours a week, working as an assistant to a professional artist. The second half of this term is continued development of independent studio work. An exhibition and evaluation of this work will take place in September in the Departmental gallery or agreed alternative. o Term Four (Fall)	o In their first term, candidates will carry out work in their chosen area of specialization in FINE 690 Graduate Studio 1 and will also complete at least 1 of 3 required elective courses. In addition, candidates will take the first of a series of seminar courses, 1 of which is required during each Fall and Winter term. These courses will deal with the issues which concern contemporary artists and critics. At the end of the first term, a committee of two faculty members will be selected to oversee the candidate's studio progress toward thesis completion. o Any candidate receiving a grade of less than 75% in one or more classes may be required to withdraw from the program. o Following is a term-by-term breakdown of the course requirements: o Term One (Fall) ▪ FINE 690 Graduate Studio (1.00 credit) ▪ FINE 680 Issues in Contemporary Art 1 (0.50 credit) ▪ Elective (0.50 credit) ▪ Pedagogy Elective (0.50 credit) ▪ Teaching Assistantship (TA) with one full time faculty member o Term Two (Winter) ▪ FINE 691 Graduate Studio 2 (1.00 credit) ▪ FINE 681 Issues in Contemporary Art 2 (0.50 credit) ▪ Elective (0.50 credit) ▪ Teaching Assistantship (TA) with one full time faculty member o Term Three (Spring) ▪ FINE 692 Graduate Summer Studio (1.00 credit) ▪ The Keith and Win Shantz International Research Scholarship ~~Keith and Win Shantz Summer Internship~~ program comprises the first half of this term. This involves six weeks, at thirty hours a week, working as an assistant to a professional artist. The second half of this term is continued development of independent studio work. An exhibition and

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
▪ FINE 682 Graduate Senior Seminar 1 (0.50 credit) ▪ Elective (0.50 credit) (only for those not following the pedagogy option) o Term Five (Winter) ▪ FINE 683 Graduate Senior Seminar 2 (0.50 credit) o Elective courses ▪ Candidates must complete 3 half credit (0.50 credit) elective courses as part of their degree requirements. Of the 3 courses, 1 may be taken at the undergraduate level and the other 2 must be taken as either FINE 694 or FINE 695. Candidates may choose from Fine Arts course offerings, or from courses offered by other departments within the University of Waterloo. If the latter option is chosen, the course must be approved by the Associate Chair before registration to ensure appropriateness and relevance. Similarly, a candidate may choose to take a course from another institution with Departmental approval. In all cases where a candidate chooses an elective from outside of the University of Waterloo Fine Arts Department, they must provide the Associate Chair with a full course description and a letter from the instructor confirming that the course will be taken by the MFA candidate at the graduate level. • **Link(s) to courses** o Fine Arts (FINE) courses o Graduate course search • **Academic Integrity Workshop** o This is a required workshop. It is for all Faculty of Arts students enrolled in graduate programs and the workshop typically takes place in September. • **Workplace Hazardous Materials Information System (WHMIS)**	evaluation of this work will take place in September in the Departmental gallery or agreed alternative. o Term Four (Fall) ▪ FINE 682 Graduate Senior Seminar 1 (0.50 credit) ▪ Elective (0.50 credit) (only for those not following the pedagogy option) o Term Five (Winter) ▪ FINE 683 Graduate Senior Seminar 2 (0.50 credit) o Elective courses ▪ Candidates must complete 3 half credit (0.50 credit) elective courses as part of their degree requirements. Of the 3 courses, 1 may be taken at the undergraduate level and the other 2 must be taken as either FINE 694 or FINE 695. Candidates may choose from Fine Arts course offerings, or from courses offered by other departments within the University of Waterloo. If the latter option is chosen, the course must be approved by the Associate Chair before registration to ensure appropriateness and relevance. Similarly, a candidate may choose to take a course from another institution with Departmental approval. In all cases where a candidate chooses an elective from outside of the University of Waterloo Fine Arts Department, they must provide the Associate Chair with a full course description and a letter from the instructor confirming that the course will be taken by the MFA candidate at the graduate level. • **Link(s) to courses** o Fine Arts (FINE) courses o Graduate course search • **Academic Integrity Workshop** o This is a required workshop. It is for all Faculty of Arts students enrolled in graduate programs and the workshop

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
o WHMIS training is a milestone requirement in the MFA program. Candidates cannot use the East Campus Hall (ECH) studios without WHMIS certification. WHMIS workshops are offered online through Waterloo LEARN (to take the online WHMIS course students must first "self-enroll" in the WHMIS course). MFA candidates must take WHMIS training in the first term of their program. • **Master's Thesis Exhibit** o In 4th and 5th terms of second year, the studio is a milestone, meaning that candidates are automatically registered in it by Graduate Studies and Postdoctoral Affairs. The actual exhibition of the student's artwork is considered the thesis and is a required milestone for an MFA in Studio Art degree at the University of Waterloo. The thesis work is accompanied by a Thesis Support Document; an illustrated, written document that is expected to be an insightful and scholarly sound explanation of the candidate's artwork. Both of these must be defended at a date specified by the Associate Chair and follow a specified structure.	typically takes place in September. • **Workplace Hazardous Materials Information System (WHMIS)** o WHMIS training is a milestone requirement in the MFA program. Candidates cannot use the East Campus Hall (ECH) studios without WHMIS certification. WHMIS workshops are offered online through Waterloo LEARN (to take the online WHMIS course students must first "self-enroll" in the WHMIS course). MFA candidates must take WHMIS training in the first term of their program. • **Master's Thesis Exhibit** o In 4th and 5th terms of second year, the studio is a milestone, meaning that candidates are automatically registered in it by Graduate Studies and Postdoctoral Affairs. The actual exhibition of the student's artwork is considered the thesis and is a required milestone for an MFA in Studio Art degree at the University of Waterloo. The thesis work is accompanied by a Thesis Support Document; an illustrated, written document that is expected to be an insightful and scholarly sound explanation of the candidate's artwork. Both of these must be defended at a date specified by the Associate Chair and follow a specified structure.

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

There will be zero impact to the current registered MFA students.

Departmental approval date (10/26/17):
Reviewed by GSO (for GSO use only) ☒ date (mm/dd/yy): 12/22/2017
Faculty approval date (mm/dd/yy): 02/15/2018
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

UNIVERSITY OF WATERLOO

Graduate Studies Program Revision Template

Prior to form submission, review the content revision instructions and information regarding major/minor modifications. For questions about the form submission, contact Trevor Clews, Graduate Studies Office.

Faculty: Mathematics

Program: Doctor of Philosophy (PhD) in Computer Science

Program contact name(s): Ian Goldberg

Form completed by:

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).

Adding an internship version of the Computer Science PhD program, in addition to keeping our existing program.

Is this a major modification to the program? Yes

Rationale for change(s):

By transferring into this new PhD program with a required internship, international students will be able to obtain a work permit to do an internship in any term, subject to the conditions stated herein.

Proposed effective date: Term: Fall Year: 2018

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/mathematics/david-r-cheriton-school-computer-science

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
DOCTOR OF PHILOSOPHY (PHD) IN COMPUTER SCIENCE **Fields (areas of research)** • Algorithms and Complexity • Artificial Intelligence • Bioinformatics • Computer Algebra and Symbolic Computation • Computer Graphics • Cryptography, Security and Privacy • Databases • Formal Methods	**DOCTOR OF PHILOSOPHY (PHD) IN COMPUTER SCIENCE – INTERNSHIP** **Fields (areas of research)** • Algorithms and Complexity • Artificial Intelligence • Bioinformatics • Computer Algebra and Symbolic Computation • Computer Graphics • Cryptography, Security and Privacy • Databases • Formal Methods

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

• Health Informatics
• Human-Computer Interaction
• Information Retrieval
• Machine Learning
• Programming Languages
• Quantum Computing
• Scientific Computing
• Software Engineering
• Systems and Networking
 	
Program information
 	
• **Admit term(s)**
  ○ Fall
  ○ Winter
  ○ Spring
 	
• **Delivery mode**
  ○ On-campus
 	
• **Program type**
  ○ Doctoral
  ○ Research
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Thesis
 	
Admission requirements
 	
• **Minimum requirements**
  ○ A Master's degree in Computer Science with a 78% average.
  ○ The Graduate Record Examination (GRE) General test is required of all applicants to the School of Computer Science, who have not completed a 4 year undergraduate degree at a North American University where English is the primary language of instruction.
  ○ Student with an undergraduate degree in Computer Science may apply for admission directly to the PhD program. Successful applicants will have an outstanding academic record, breadth of knowledge in computer science, and strong letters of recommendation.
  ○ PhD applicants may be admitted into the Master of Mathematics (MMath)
	• Health Informatics
	• Human-Computer Interaction
	• Information Retrieval
	• Machine Learning
	• Programming Languages
	• Quantum Computing
	• Scientific Computing
	• Software Engineering
	• Systems and Networking
	
	Program information
	
	• **Admit term(s)**
	  ○ Fall
	  ○ Winter
	  ○ Spring
	
	• **Delivery mode**
	  ○ On-campus
	
	• **Program type**
	  ○ Doctoral
	  ○ Research
	
	• **Registration option(s)**
	  ○ Full-time
	  ○ Part-time
	
	• **Study option(s)**
	  ○ Thesis
	
	Admission requirements
	
	• **Minimum requirements**
	  ○ Students in the Doctor of Philosophy (PhD) in Computer Science program can apply to transfer into the Doctor of Philosophy (PhD) in Computer Science – Internship program after completing at least one academic term. Admittance will be decided based on the student's progress to date, and is subject to approval by the student's supervisor(s) and the Director of Graduate Studies in the David R. Cheriton School of Computer Science.
	
	Degree requirements
	
	Thesis option:

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

program. Like all MMath students, they will have the option to transfer into the PhD program before completing the master's thesis if their performance warrants.
 	
• **Application materials**
  ○ Résumé
  ○ Supplementary information form
  ○ Transcript(s)
 	
• **References**
  ○ Number of references: 3
  ○ Type of references: at least 2 academic
 	
• **English language proficiency (ELP)** (if applicable)
 	
Degree requirements
 	
Thesis option:
 	
• **Graduate Academic Integrity Module (Graduate AIM)**
 	
• **Courses**
  ○ Students who already have a Master's degree must take 4 additional one-term Computer Science graduate courses after the Master's degree. At least 1 of these courses must be at the 800 level, and at most 1 can be at the 600 level.
  ○ Students who enter the PhD program directly from a bachelor's degree must take 8 additional one-term Computer Science graduate courses after the bachelor's degree. At least 3 of these courses must be at the 800 level, and at most 3 can be at the 600 level.
  ○ Note: courses need to be selected from the Categories and Areas table but exceptions can be granted by the School of Computer Science.
 	
• **Link(s) to courses**
  ○ Computer Science (CS) courses
  ○ Graduate course search
 	
• **PhD Comprehensive Examination I**
  ○ The Comprehensive I requirement ("breadth requirement") ensures that a student has sufficient breadth of
	• **Graduate Academic Integrity Module (Graduate AIM)**
	
	• **Courses**
	  ○ Students who already have a Master's degree must take 4 additional one-term Computer Science graduate courses after the Master's degree. At least 1 of these courses must be at the 800 level, and at most 1 can be at the 600 level.
	  ○ Students who enter the PhD program directly from a bachelor's degree must take 8 additional one-term Computer Science graduate courses after the bachelor's degree. At least 3 of these courses must be at the 800 level, and at most 3 can be at the 600 level.
	  ○ Note: courses need to be selected from the Categories and Areas table but exceptions can be granted by the School of Computer Science.
	
	• **Link(s) to courses**
	  ○ Computer Science (CS) courses
	  ○ Graduate course search
	
	• **PhD Internship**
	  ○ Students are required to complete one or more four-month internships working on a topic related to their program. The internships will be arranged by the student, possibly with assistance from the supervisor. The internship must be approved by the supervisor and the Director of Graduate Studies in the David R. Cheriton School of Computer Science. At most two consecutive terms can be taken for an internship. An internship may not be taken in the student's final term.
	
	• **PhD Comprehensive Examination I**
	  ○ The Comprehensive I requirement ("breadth requirement") ensures that a student has sufficient breadth of knowledge to undertake research at the PhD level. A student meets the requirement by taking a number of advanced courses in a broad range of categories and areas. The courses used must all have a minimum mark of 78% (or equivalent).

Current Graduate Studies Academic Calendar content:

knowledge to undertake research at the PhD level. A student meets the requirement by taking a number of advanced courses in a broad range of categories and areas. The courses used must all have a minimum mark of 78% (or equivalent).

- Categories and Areas for Breadth Requirement: the breadth requirement divides the subject matter of computer science into three broad categories. Each category is subdivided into areas that represent a range of the fields of computer science, as given in the table below. The table also indicates where computer science courses at the University of Waterloo fit in these categories and areas. A student must have at least 1 advanced course in six of the eleven areas, including at least one area from each category:

Category	Area	Computer Science (CS) courses
Computing Technology	Software Engineering	CS 645, CS 646, CS 647, CS 745, CS 746, CS 846
	Programming Languages	CS 642, CS 644, CS 744, CS 842
	Hardware and Software Systems	CS 650, CS 651, CS 652, CS 654, CS 655, CS 656, CS 657, CS 658, CS 755, CS 758, CS 854, CS 856, CS 858**,CS 869
Mathematics of Computing	Algorithms and Complexity	CS 662, CS 664, CS 666, CS 758, CS 761, CS 762, CS 763, CS 764, CS 765, CS 767, CS 840, CS 858**, CS 860
	Scientific and Symbolic Computing	CS 670, CS 672, CS 675, CS 676, CS 687, CS 770, CS 774, CS 775, CS 778, CS 779, CS 780, CS 870, CS 887
	Computational Statistics	CS 680, CS 685, CS 786, CS 885

Proposed Graduate Studies Academic Calendar content:

- Categories and Areas for Breadth Requirement: the breadth requirement divides the subject matter of computer science into three broad categories. Each category is subdivided into areas that represent a range of the fields of computer science, as given in the table below. The table also indicates where computer science courses at the University of Waterloo fit in these categories and areas. A student must have at least 1 advanced course in six of the eleven areas, including at least one area from each category:

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Computing Technology	Software Engineering	CS 645, CS 646, CS 647, CS 745, CS 746, CS 846
	Programming Languages	CS 642, CS 644, CS 744, CS 842
	Hardware and Software Systems	CS 650, CS 651, CS 652, CS 654, CS 655, CS 656, CS 657, CS 658, CS 755, CS 758, CS 854, CS 856, CS 858**,CS 869
Mathematics of Computing	Algorithms and Complexity	CS 662, CS 664, CS 666, CS 758, CS 761, CS 762, CS 763, CS 764, CS 765, CS 767, CS 840, CS 858**, CS 860
	Scientific and Symbolic Computing	CS 670, CS 672, CS 675, CS 676, CS 687, CS 770, CS 774, CS 775, CS 778, CS 779, CS 780, CS 870, CS 887
	Computational Statistics	CS 680, CS 685, CS 786, CS 885
	Quantum Information and Computation	CS 766, CS 768, CS 867
Applications	Artificial Intelligence	CS 684, CS 686, CS 784, CS 785, CS 787, CS 886

Current Graduate Studies Academic Calendar content:

	Quantum Information and Computation	CS 766, CS 768, CS 867
Applications	Artificial Intelligence	CS 684, CS 686, CS 784, CS 785, CS 787, CS 886
	Databases	CS 640, CS 648, CS 740, CS 741, CS 742, CS 743, CS 848, CS 856*
	Graphics and User Interfaces	CS 649, CS 688, CS 781, CS 783, CS 788, CS 789, CS 791, CS 888, CS 889
	Bioinformatics	CS 682, CS 782, CS 882
	Health Informatics	CS 792

- Note: * The versions of CS 856 entitled "Internet-Scale Distributed Data Management" and "Web Data Management" can be used as a Databases course.
- Note: ** CS 858 can be used as a Hardware and Software Systems course or as an Algorithms and Complexity course, depending on the course offering.
- Advanced courses taken in an undergraduate program as well as graduate courses can be used to meet the breadth requirement in each of the categories and areas. For example, at the University of Waterloo many of the 600-level graduate courses hold lectures in common with 400-level undergraduate courses. For the purposes of meeting the breadth requirement, the 400-level course is considered to be equivalent to the 600-level course. Although courses from other universities may not cover exactly the same material as the University of Waterloo courses, they will be evaluated by the Graduate Committee to determine if the topics covered and the depth of the material is appropriate. Offerings of CS 690B, CS 698, CS 798, CS 898 or equivalent may also count in

Proposed Graduate Studies Academic Calendar content:

	Databases	CS 640, CS 648, CS 740, CS 741, CS 742, CS 743, CS 848, CS 856*
	Graphics and User Interfaces	CS 649, CS 688, CS 781, CS 783, CS 788, CS 789, CS 791, CS 888, CS 889
	Bioinformatics	CS 682, CS 782, CS 882
	Health Informatics	CS 792

- Note: * The versions of CS 856 entitled "Internet-Scale Distributed Data Management" and "Web Data Management" can be used as a Databases course.
- Note: ** CS 858 can be used as a Hardware and Software Systems course or as an Algorithms and Complexity course, depending on the course offering.
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- Procedure: within a month of entering a PhD program, a new student submits a document to the Graduate Committee detailing their relevant past courses

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
an appropriate area. Courses offered by other departments may also have assigned areas. ○ Procedure: within a month of entering a PhD program, a new student submits a document to the Graduate Committee detailing their relevant past courses and future plans. Written in consultation with the student's supervisor, it should indicate: ▪ Courses or equivalent (including theses) already taken by the student that fulfil part of the breadth requirement. ▪ A proposed program of study (including the terms during which the courses will be taken), which the student intends to complete in order to fulfil the remaining part of the breadth requirement. ○ The Graduate Committee must be able to determine the content, level and mark for courses used to fulfil the requirement as compared to courses at Waterloo. The student must provide sufficient evidence to convince the Committee that a course (or courses) listed does indeed fulfil an area requirement. Pertinent information includes course syllabi, textbooks used, descriptions of prerequisites or co-requisites, and references to university catalogues (web-based or otherwise accessible). The Graduate Committee will ask the student for more information or certification in cases of doubt and will consult with experts in the Department as it deems appropriate. The Graduate Committee will be the final arbiter of whether courses taken and marks obtained satisfy the requirements. ○ By the end of the student's first term in the program, the Committee will inform the student which categories and areas the submitted courses have satisfied and whether the submitted plan will suffice to complete the breadth requirement. ○ A student must complete the breadth requirement by the end of their fourth	and future plans. Written in consultation with the student's supervisor, it should indicate: ▪ Courses or equivalent (including theses) already taken by the student that fulfil part of the breadth requirement. ▪ A proposed program of study (including the terms during which the courses will be taken), which the student intends to complete in order to fulfil the remaining part of the breadth requirement. ○ The Graduate Committee must be able to determine the content, level and mark for courses used to fulfil the requirement as compared to courses at Waterloo. The student must provide sufficient evidence to convince the Committee that a course (or courses) listed does indeed fulfil an area requirement. Pertinent information includes course syllabi, textbooks used, descriptions of prerequisites or co-requisites, and references to university catalogues (web-based or otherwise accessible). The Graduate Committee will ask the student for more information or certification in cases of doubt and will consult with experts in the Department as it deems appropriate. The Graduate Committee will be the final arbiter of whether courses taken and marks obtained satisfy the requirements. ○ By the end of the student's first term in the program, the Committee will inform the student which categories and areas the submitted courses have satisfied and whether the submitted plan will suffice to complete the breadth requirement. ○ A student must complete the breadth requirement by the end of their fourth term. • **PhD Comprehensive Examination II** ○ The Comprehensive II requirement ensures that a student has sufficient depth of knowledge in the chosen area of research. It comprises an oral presentation of a research proposal

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

term.
 	
• **PhD Comprehensive Examination II**
  ○ The Comprehensive II requirement ensures that a student has sufficient depth of knowledge in the chosen area of research. It comprises an oral presentation of a research proposal (not a thesis proposal) together with questioning by the Advisory Committee. The presentation and questioning are held in closed session. The Committee will determine whether the chosen research area is suitable for a thesis topic and whether the student has demonstrated an appropriate depth of knowledge of the chosen area and is capable of undertaking such a thesis. The Committee reports its decision to the student and to the Graduate Committee: either "pass" or "fail and re-take later". In the latter case, the report details the reasons for the decision and what needs to be done to satisfy the Committee.
  ○ An Advisory Committee is struck for each PhD student. It consists of the student's supervisor, co-supervisor (if any) and at least two other faculty members in the David R. Cheriton School of Computer Science chosen by the mutual agreement of the Committee, the student and the Director of Graduate Studies. Normally, this committee forms the basis of the student's PhD thesis defence committee.
  ○ PhD students are normally expected to complete the Comprehensive II requirement within the first six terms of their program. If the student changes research area, they should pass a new Comprehensive II examination in the new area.
 	
• **PhD Seminar**
  ○ Students must present at least 3 publicly announced seminars during the program. The purpose of this requirement is twofold: first, it ensures that each student participates in the academic life of the Department and, second, it provides an opportunity for
	(not a thesis proposal) together with questioning by the Advisory Committee. The presentation and questioning are held in closed session. The Committee will determine whether the chosen research area is suitable for a thesis topic and whether the student has demonstrated an appropriate depth of knowledge of the chosen area and is capable of undertaking such a thesis. The Committee reports its decision to the student and to the Graduate Committee: either "pass" or "fail and re-take later". In the latter case, the report details the reasons for the decision and what needs to be done to satisfy the Committee.
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	• **PhD Seminar**
	  ○ Students must present at least 3 publicly announced seminars during the program. The purpose of this requirement is twofold: first, it ensures that each student participates in the academic life of the Department and, second, it provides an opportunity for students to hone their presentational skills. Each seminar should be attended by at least the student's supervisor and one other faculty member of the David R. Cheriton School of Computer Science, who will be required to assess and approve the quality of the

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

students to hone their presentational skills. Each seminar should be attended by at least the student's supervisor and one other faculty member of the David R. Cheriton School of Computer Science, who will be required to assess and approve the quality of the presentation.
 	
• **PhD Thesis**
  ○ Students must submit a thesis embodying the results of their own original research. Upon completion of the thesis, the student defends the final document before an examination board consisting of the supervisor, co-supervisor (if any), two faculty members from the David R. Cheriton School of Computer Science, one University of Waterloo faculty member external to the School of Computer Science and an external examiner. The examination exposes the student's work to scholarly criticism and gives the student the opportunity to defend it.
	presentation.
	
	• **PhD Thesis**
	  ○ Students must submit a thesis embodying the results of their own original research. Upon completion of the thesis, the student defends the final document before an examination board consisting of the supervisor, co-supervisor (if any), two faculty members from the David R. Cheriton School of Computer Science, one University of Waterloo faculty member external to the School of Computer Science and an external examiner. The examination exposes the student's work to scholarly criticism and gives the student the opportunity to defend it.

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

Students currently in the PhD in Computer Science program will be allowed to take advantage of the opportunities afforded by the new Internship version of the program.

Departmental approval date (04/11/18):
Reviewed by GSO (for GSO use only) ☒ date (mm/dd/yy): 05/03/2018
Faculty approval date (04/17/18):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

UNIVERSITY OF WATERLOO

GRADUATE STUDIES OFFICE
Waterloo, Ontario, Canada N2L 3G1
uwaterloo.ca/graduate-studies | gsoffice@uwaterloo.ca
Fax 519-746-3051

Senate Graduate and Research Council – Course/Milestone – New/Revision/Inactivation form

Faculty: Math

Effective term: Term/Year Fall 2018

Course ☐ New ☐ Revision ☐ Inactivation ☐

Milestone ☒ New ☒ Revision ☐ Inactivation ☐

New milestone title: Choose an item. **PhD Internship**

For course revisions, indicate the type(s) of changes:
(e.g. consent, description, title, requisites)

Course Subject code: Choose an item. Course number:

Course Title (max. 100 characters incl. spaces):

Course Short Title (max. 30 characters incl. spaces):

Grading Basis: Choose an item.

Course Credit Weight: Choose an item.

Course Consent Required: ☐ Choose an item.

Course Description:

New course description (for revision only):

Meet Type(s): Choose an item. Choose an item. Choose an item. Choose an item.

Primary Meet Type: Choose an item.

Requisites:

Special topics course: Yes ☐ No ☐

Cross-listed: Yes ☐ No ☐

Course Subject(s) to be cross-listed with and approval status:

Sections combined/heldwith:

Rationale for request:

Adding an internship version of the Computer Science PhD program, in addition to keeping our existing program. By transferring into this new PhD program with a required internship, international students will be able to obtain a work permit to do an internship in any term, subject to the conditions stated in the attached Graduate Studies Program Revision Template.

The milestone should be applied to the following program:
Doctor of Philosophy (PhD) in Computer Science - Internship

Prepared by: Date: Click here to enter a date.

UNIVERSITY OF WATERLOO
Graduate Studies and Postdoctoral Affairs
Waterloo, Ontario, Canada N2L 3G1
uwaterloo.ca/graduate-studies | gsoffice@uwaterloo.ca

May 4, 2018

TO: Kathy Winter, Privacy Officer and Assistant University Secretary,
Senate Graduate and Research Council

FROM: Lynn Judge, Director, Graduate Academic Services

RE: Graduate Studies Regulations and Academic Calendar Changes for Senate Graduate and Research Council

Items for Approval:

A. Drop/Add Deadline Date - Fee Arrangement Deadlines - Graduate Student Class Enrolment
B. Apply for Graduation
C. Inactive Status
D. Master's Thesis Regulations
E. PhD Comprehensive Examinations

A. Drop/Add Deadline Date - Fee Arrangement Deadlines - Graduate Student Class Enrolment

Issues related to the length of time that some graduate students are class enrolled without fee arrangement were discussed at the Graduate Operations Committee meeting held on February 20, 2018 and the Graduate Student Relations Committee held on March 29, 2018. Both committees endorsed the recommendations. The Graduate Studies Academic Calendar changes are identified below.

Recommendations:
• Change the drop/add deadline to the end of the third week of classes to align with the 100% refund period for tuition fees. The current regulation is the fourth week.

• Require graduate students to make their fee arrangements by the end of the third week of classes. (Students admitted after the start of term can be fee arranged and class enrolled on an exceptional basis).

Note that graduate students who are not fee arranged and have enrolled in classes would have their classes dropped at the end of the third week of classes. Students would be reminded of the outstanding fees and the drop of classes a week prior to the end of the third week of classes/100% refund deadline.

General information and regulations

Enrolment and time limits - Course drop/add date

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/enrolment-and-time-limits

During the first three ~~four~~ weeks of term, students must drop or add graduate courses using Quest, the University of Waterloo's online student information system. For courses with enrolment restrictions, students must obtain permission through their Department Graduate Assistant.

Graduate students who wish to enrol in an undergraduate course may petition using a Drop/Add form, obtainable through their Department or the Graduate Studies and Postdoctoral Affairs (GSPA). Signature of the instructor, supervisor and Department Graduate Officer are required.

After the first three ~~four~~ weeks of term, students may not drop or add a course except by petition using the Drop/Add form, and only under exceptional circumstances with the signature of the instructor, supervisor, Department Graduate Officer and the Associate Dean (Graduate Studies) of their home Faculty.

These are Graduate Studies and Postdoctoral Affairs (GSPA) deadlines. Individual Faculties may have earlier deadlines. (*Please check with your Associate Dean's Office.*)

Courses may not be dropped or added, nor course status changed, after the examination period begins.

Academic deadlines and events - Academic term deadlines

https://uwaterloo.ca/graduate-studies-academic-calendar/academic-deadlines-and-events

Table of academic term deadlines			
Terms and Deadlines	**Spring 2018 May 1 - August 31**	**Fall 2018 September 1 - December 31**	**Winter 2019 January 1 - April 30**
Graduate Open Class Enrolment Begins	March 27 (T)	August 2 (Th)	December 3 (M)
Term Begins	May 1 (T)	September 1 (S)	January 1 (T)
Co-operative Work Term Begins	May 1 (T)	September 4 (T)	January 7 (M)
Classes Begin	May 1 (T)	September 6 (Th)	January 7 (M)
100% Tuition Refund Deadline	May 22 (T)	September 26 (W)	January 25 (F)
Mid-Term Study Break	N/A	October 9, 10 (T, W)	February 19-22 (T-F)
Make-up Day(s) for in-term holidays and Mid-Term Study Break	May 22 (T), July 25 (W)	October 11, 12 (Th, F), December 3 (M)	N/A
Graduate Open Class Enrolment Ends	May 28 (M)	September 26 (W)	January 27 (U)
Convocation	June 12-16 (T-S)	October 19, 20 (F, S)	N/A
50% Tuition Refund Deadline	June 19 (T)	October 24 (W)	February 15 (F)
~~Registration/Enrolment Closes - Last day for students to pay fees/enrol or change status~~	~~June 30 (S)~~	~~November 1 (Th)~~	~~February 1 (F)~~
Government Reporting Date	June 30 (S)	November 1 (Th)	February 1 (F)
Classes End	July 25 (W)	December 3 (M)	April 5 (F)
Pre-Examination Study Days	July 26, 27 (Th, F)	December 4, 5 (T, W)	April 8, 9 (M, T)
On-Campus Examinations Begin	July 28 (S)	December 6 (Th)	April 10 (W)
Online Class Examination Days	July 28 (S), August 3 (F)	December 7, 8 (F, S)	April 12, 13 (F, S)
On-Campus Examinations End	August 11 (S)	December 21 (F)	April 27 (S)
Co-operative Work Term Ends	August 24 (F)	December 21 (F)	April 26 (F)
Program Completion Deadline for Convocation (see below)	Fall Convocation August 31 (F)	Spring Convocation April 30, 2019 (T)	Spring Convocation April 30 (T)
Grades available on Quest	September 1 (S)	January 1 (T)	May 1 (W)

Notes:

1. For information on payment instructions and graduate student fees please refer to the Finance website.
2. Graduate students who are not fee arranged and have enrolled in classes will have their classes dropped at the end of the third week of classes (end of open enrolment).
3. Students who are not fee arranged will have their enrolment lapse and must apply to re-enter the program.

B. Apply for Graduation

Effective June 2018, graduate students apply for graduation in Quest one month prior to their expected program completion.

Notes:

1. Students must remain enrolled and fee arranged until their final degree requirements are completed. For programs with a thesis, completion includes submission and approval from Graduate Studies and Postdoctoral Affairs of the thesis in UWSpace.
2. Faculties and/or departments and schools will verify degree completion.
3. Graduate students are notified of degree completion approval by Graduate Studies and Postdoctoral Affairs.
4. The completion, degree, and convocation dates will appear on student academic records/transcripts.

Full Convocation information is available through the Graduate Studies and Postdoctoral Affairs website.

~~Deadlines for application for graduation Graduate studies intention to graduate/program completion form to Graduate Studies and Postdoctoral Affairs (GSPA) are:~~

~~Table of convocation ceremonies and deadlines~~	
~~**Convocation ceremony**~~	~~**Deadline**~~
~~Spring Convocation (June)~~	~~April 30 - for students degree completing in the Fall (Sept-Dec) and Winter (Jan-April) terms~~
~~Fall Convocation (October)~~	~~August 31 - for students degree completing in the Spring (May-Aug) term~~

~~**Note:**~~

1. ~~Students who have completed all program requirements must submit the Graduate studies intention to graduate/program completion form to their department to initiate a formal review and verification of their program completion status and approval to graduate. Once approved by the department the form will be submitted to GSPA for completion processing.~~
2. ~~Receipt of this completed form (in GSPA) by the deadline indicated above, acknowledges a student's intention to graduate and completion of all degree requirements (for programs with a thesis, completion includes submission and approval from GSPA of the thesis in UWSpace).~~

~~Full Convocation information is available through the Graduate Studies and Postdoctoral Affairs website.~~

C. Inactive Status

Recent clarifications from Immigration, Refugees and Canadian Citizenship Canada (IRCC) confirm that international graduate students on a Study Permit may not enroll as inactive for the purpose of work. Full-time international students may work up to 20 hours per week. International graduate students may apply for a Work Permit if the work is required as part of the degree requirements for the program.

General information and regulations

Enrolment and time limits - Inactive Status

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/enrolment-and-time-limits

Students may request up to two consecutive terms of Inactive status by completing a Change of enrolment status form, which must be approved by the Associate Dean (Graduate Studies) of their Faculty.

Valid reasons for Canadian citizens or permanent residents to request Inactive status include illness, limited external research or work opportunity which is not related to their University of Waterloo program, personal or family obligations, lack of suitable courses (for students in coursework-only programs), or temporary financial difficulties for which the University cannot provide funds.

Valid reasons for international graduate students to request Inactive status include illness, personal or family obligations, lack of suitable courses (for students in coursework-only programs), or temporary financial difficulties for which the University cannot provide funds.

International students must consider the immigration regulations/conditions (R220.1 (1)) pertaining to their Study Permit and eligibility for the Post-graduation Work Permit Program when requesting Inactive status. Individual circumstances may vary. International students should meet with an Immigration Consultant in the Student Success Office for advice.

Students should not request Inactive status to work on their thesis or any other activity related to their graduate program. Normally, Inactive status is approved for a maximum of two consecutive terms. Students who request more than two consecutive terms of leave because they have other commitments such as a full-time job or travel plans, should voluntarily withdraw from their program and may reapply when they are prepared to resume their studies. Normally, students who have incomplete courses on their record are not eligible for Inactive status.

Students who have been granted Inactive status for a term are not expected to study or conduct research while on leave, and thus should not expect access to their supervisor. Students with Inactive status will have limited access to the services of the university. More information about access to services is available on the Graduate Studies and Postdoctoral Affairs (GSPA) website.

D. Master's Thesis Regulations

The membership for a master's theses examination committee was reviewed by the Graduate Operations Committee to ensure that the minimum requirement included a more flexible membership for collaborative programs, and opportunity for the Associate Dean (Graduate Studies) of the Faculty to appoint an adjunct who is not a regular tenured or tenure track faculty member of the University of Waterloo.

General information and regulations

Minimum Requirements for the Master's degree - Master's degree with Thesis

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/minimum-requirements-masters-degree

In the case of a Master's program involving a thesis, one copy of the thesis is required for each member of the Reading Committee or Examining Committee. The Committee shall be comprised of:
at least one tenured or tenure track faculty member of the student's home department who will normally be the student's supervisor(s); an additional tenured or tenure track faculty member from the University of Waterloo; and at least one additional examiner whose expertise can support the evaluation of the Master's thesis. External adjunct appointments require the approval of the Associate Dean, Graduate from the student's home Faculty. No more than one adjunct faculty member (including Professors Emeriti) may serve on the Examining Committee. ~~which consists of at least two faculty members in addition to the supervisor appointed in the student's department or co-supervisors. The supervisor and one member are faculty members of the student's department.~~ One copy of the thesis is submitted either to the department or to the Office of the Associate Dean (Graduate Studies) of the Faculty upon being given to the Reading/Examining Committee for acceptance/defence. The thesis should normally be on public display for two weeks.

In departments that do not normally require an oral defence of the Master's thesis the Associate Dean (Graduate Studies) may require such defence if circumstances warrant it or if the department or student requests it.

When an oral defence for a Master's thesis is a requirement and where the protection of intellectual property is sought by the filing of a patent application, the student and supervisor(s) may request a closed thesis examination and/or a restriction on the circulation of the thesis as outlined in the Graduate Thesis Regulations.

When the thesis is accepted by the department and Faculty, and all other requirements for the degree have been met, the student must provide the University with an electronic copy of their approved thesis as a final University degree requirement. Theses must be prepared and submitted as outlined in the Graduate Thesis Regulations.

E. PhD Comprehensive Examinations

In 2017, a study to identify established PhD Comprehensive Examination regulations and procedures at the Faculty, department or school levels was completed. A proposal for university-level minimum requirements was approved by the Graduate Operations Committee, and the Graduate Student Relations Committee in 2018.

General information and regulations

Minimum Requirements for the PhD degree - Comprehensive examination

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/minimum-requirements-phd-degree

Comprehensive Examinations

PhD programs, except those noted here, require doctoral students to successfully complete a comprehensive exam as part of their academic requirements. In some cases, students may be required to successfully complete a series of exams in order to satisfy the comprehensive requirement.

The purpose of this document is to provide university-level guidance to students, supervisors and Departments / Schools (referred to as Departments in this document) on comprehensive exams. This document also presents links to Faculty level guidelines that are consistent with the principles established here. Links to Departments' guidelines are available on the Faculty pages.

Comprehensive Exam Purpose

Comprehensive exams serve multiple purposes depending on the discipline. Permitted purposes for comprehensive exams at the University of Waterloo include demonstrating that:

- PhD students have the appropriate academic background – a foundation and breadth of knowledge in the field of study– to be successful in their PhD program;
- PhD students have the capacity to engage in scholarly communications – both oral and written – necessary to be successful in their PhD studies;
- PhD students have developed a novel research topic to be evaluated during their PhD studies.

The purpose(s) of the exam shall be communicated clearly to students.

Comprehensive Exam Timing

The comprehensive exam is an important accomplishment in the completion of students' PhD program. Normally, completing the comprehensive exam allows students to advance to the research or dissertation phase of their studies. The timing of the exam should allow sufficient time for students to achieve the foundational knowledge to be successful in their programs. The exam timing should allow for timely feedback to students on their progress and should motivate appropriate times to completion. To balance these two objectives, the University requires that:

- Students with no previous studies at the PhD level successfully complete the comprehensive exam not later than the end of their seventh term of studies;
- Students who have completed previous studies in another PhD program at the University of Waterloo or at another university, successfully complete the comprehensive exam not later than their fourth term of studies in their current program or their seventh term of study at the PhD level, whichever is longer.

Earlier deadlines are at the discretion of the Faculty, Department or Program level.

A student who anticipates not meeting these requirements (up to the final evaluation of the exam) may seek an extension to the deadline to complete the comprehensive exam. The student is required to submit a petition (link to policy 70) providing evidence of extenuating circumstances to the student's Associate Dean, Graduate Studies.

Valid extenuating circumstances are normally limited to issues related to the student's (or student's immediate family's) health or documented incidents involving graduate student supervision that can be demonstrated to have delayed the student's progress. The conduct of research or other projects is not considered a valid extenuating circumstance to delay beyond the normal comprehensive examination completion deadline. Guidance on seeking accommodation due to health reasons shall be managed by the University's AccessAbility Office (link to AccessAbility Office website).

If the petition is granted, the Associate Dean, Graduate Studies shall coordinate with the student's Graduate Officer to establish a new deadline by which the comprehensive exam shall be completed. This deadline shall be communicated to the student in the notice of decision on the petition.

If no petition has been previously adjudicated, and a student fails to meet these requirements by the end of the seventh term, the student's academic status will be changed to **Required to Withdraw**. Students may seek to have their standing changed to allow them to continue in their programs by submitting a petition under Policy 70 to the student's Associate Dean, Graduate Studies, not later than 10 business days from the change of status. The petition rules described in this section apply.

Comprehensive Examinations and Students' Academic Requirements

A student is encouraged to communicate with supervisor(s) and / or instructors regarding the need to balance the student's effort toward preparing for and completing the comprehensive exam, and any other academic requirements in the term during which the comprehensive exam takes place. Additional guidance for students serving as a TA are outlined in Policy 30.

In cases where agreement cannot be reached on revised expectations, the Department's Graduate Officer shall determine and communicate the revised expectations, if any, to the student and the supervisor / instructor.

Comprehensive Examining Committee

In many cases a student's comprehensive exam written and / or oral components are evaluated by an examining committee constituted for a given student. These rules govern the composition of these examining committees.

The comprehensive examining committee shall engage those who can advance the purpose(s) of the exam. The University requires that the committee includes at least three examiners who:

- hold a PhD or equivalent degree (as determined by the Associate Vice President, Graduate Studies and Postdoctoral Affairs),
- two of whom are not the student's supervisor(s),
- at least one of whom is a tenured or tenure-track member of the student's Department or School, and
- at least two of whom hold regular faculty appointments at the University of Waterloo.

Additional committee members may be required at the discretion of the Faculty, Department or Program. When examining committee members are external to the University of Waterloo, their purpose in the exam process shall be clearly communicated to the student.

Normally, the examining committee will not exceed five examiners.

The comprehensive exam shall be chaired by a tenured or tenure-track faculty member at the University of Waterloo with Approved Doctoral Dissertation Supervision (ADDS) status, normally from the student's home Department / School, who is not the student's supervisor or co-supervisor. The Chair's role is at a minimum to ensure that this portion of the exam is conducted in a manner that is consistent with appropriate guidelines. The Chair is a non-voting member of the comprehensive examining committee.

The composition of the comprehensive examining committee will be approved by the Associate Dean, Graduate Studies for the student's Faculty, or delegate.

The method by which the comprehensive examining committee is constituted and the timing of the examining committee formation shall be clearly articulated and communicated to students.

Comprehensive Exam Format and Content

The format and content of the comprehensive exam shall be directly related to the stated purpose(s) of the exam. These elements shall be clearly articulated and communicated to students to ensure transparency and clarity of expectations. If a student in a program perceives a lack of clarity on these issues, these concerns should immediately be communicated to the student's Department's Graduate Officer.

Students may warrant an accommodation to allow for an alternative exam format other than the norm as described by a Faculty or Department. For accommodations related to health, the student shall provide supporting medical documentation to the University's AccessAbility Office where the request will be vetted. As a result of that evaluation, AccessAbility shall determine whether an accommodation is warranted. When an accommodation is determined appropriate, AccessAbility shall communicate the decision and the nature of the accommodation to the Graduate Officer in the student's home Department.

Requests for accommodation not related to health issues shall be made by students to the Graduate Officer in the student's home department, who will coordinate the process by which the request for accommodation will be advanced.

Outcomes of the Comprehensive Exam

This section defines permitted outcomes of Comprehensive examinations at the University of Waterloo. On a candidate's first attempt at the comprehensive exam, the outcome shall be one of:

- Passed: the candidate successfully completed all requirements of the examination;
- Passed conditionally: the candidate will be considered to have completed the exam successfully upon having satisfied conditions established by the examining committee. The conditions shall:
    - Be communicated to the student in writing;
    - Contain the date by which the conditions must be satisfied;
    - Identify the member(s) of the examining committee responsible for determining that the conditions have been met. Normally, this determination will be made by at least one member of the committee other than the student's supervisor or cosupervisors.
      Failure to satisfy the conditions within the designated time limit shall result in an outcome of Re-examination.

- Re-examination: the candidate will be required to repeat the exam. In this case, the student shall be provided written communication that identifies the deficiencies in the exam that led to this outcome and the deadline by which the re-examination must take place. In the case of re-examination it is anticipated that the committee membership will be the same as the initial committee. Any change in membership must adhere to committee guidelines and be approved by the student's Associate Dean Graduate Studies or delegate.

When a candidate is re-examined, the outcomes are limited to:

- Passed
- Exam Unsuccessful: the candidate will be deemed to have failed to satisfy the program's comprehensive exam requirement. In this case, the student shall receive written communication identifying the deficiencies in the exam that led to this outcome.

A student who is deemed to have failed to satisfy the comprehensive exam requirement (Exam Unsuccessful) may not continue in the current PhD program. The student's status will change to **Required to Withdraw** in the term immediately following the term in which the examination took place. The student may seek admission to another PhD program or to any Master's degree program at the University of Waterloo.

The outcome of the exam is determined by the majority vote of the examining committee. The following rules govern the voting process:

- In the case where the student is co-supervised, the co-supervisors' votes shall count collectively as one vote. In the case where co-supervisors vote for different outcomes, these votes shall count as 0.5 votes for each outcome.
- In the case where only two outcomes receive votes and the number of votes is equal for both outcomes, the decision shall be for the less positive outcome, provided that outcome is not exam unsuccessful.
- If the previous case results in an exam unsuccessful outcome, or if no majority is obtained, the case shall be referred to the Associate Dean, Graduate Studies, who shall make the final determination of the outcome of the exam.

Those members of the examining committee who are voting members shall be clearly communicated to the candidate.

In programs where the comprehensive exam involves multiple components, a student may obtain different outcomes on each component of the exam. The comprehensive exam will be considered satisfied when the candidate has passed all components of the exam. The comprehensive exam will be considered failed if the candidate receives an exam unsuccessful outcome on any component. No component may be repeated more than once.

A student may seek reassessment of the exam evaluation only when the outcome is reexamination or exam unsuccessful based on the written element of the comprehensive exam. A student may not seek a reassessment of the oral component. A request for reassessment shall follow the process described in Policy 70 (reassessment challenge).

Academic Integrity and the Comprehensive Exam

The University considers academic integrity to be an integral part of all scholarship. Violations of academic integrity are handled under University Policy 71.

When the comprehensive exam involves a written submission of original work by the candidate completed in a non-invigilated setting, the student shall employ the University's plagiarism detection software leading up to the submission of the written document to the examining committee. The student is encouraged to discuss the reports generated from the software with their supervisor(s) to avoid academic integrity violations. The report generated related to the document submitted to the examining committee shall be included with the student's written element and shall be made available to the committee.

In cases where comprehensive exams involve the submission of a written document followed by an oral exam component, the following process shall be followed regarding suspected violations of academic integrity on the written element: the person identifying the possible violation shall communicate the concern in writing only to the Associate Dean, Graduate Studies in the student's home Faculty. The Associate Dean shall then assess the allegations. If the vetting cannot be completed prior to the scheduled date of the oral component of the exam, the oral exam shall be postponed, pending the outcome of the investigation. If the vetting is completed prior to the oral exam, and no violation is identified, then the exam can be held as scheduled.

When a change in comprehensive examination date is necessary, the Associate Dean Graduate Studies shall inform the candidate, the supervisor or co-supervisors and the graduate officer not later than one week prior to the date of the scheduled exam. If a violation is determined to have happened, the Associate Dean shall proceed under Policy 71.

If no violation is deemed to have occurred, the exam shall be rescheduled to the satisfaction of the student, the supervisors, and the examining committee. This rescheduling of the exam shall be considered a valid extenuating circumstance to extend the examination deadline.

If an academic integrity violation is believed to have occurred during the oral component of the comprehensive exam, the person suspecting the violation shall ask the chair to pause the exam. The concerns identified shall be communicated to the chair (only) who will then determine the course of action. If the Chair believes that uncertainty exists regarding the concerns identified, the Chair may determine that the exam shall continue and the potential academic integrity violation will be vetted after the completion of the exam. If the Chair believes that the suspected violation is likely to be valid or that the alleged occurrence precludes a fair evaluation of the candidate, the Chair shall then suspend the exam until a determination can be made as to whether an academic integrity violation has occurred.

In both cases, the suspected academic integrity violation shall be reported to and investigated by the Associate Dean, Graduate Studies in the student's home Faculty under Policy 71.

When the comprehensive exam includes the completion of a written exam in a controlled environment, suspected violations of academic integrity in these cases should be reported to the Associate Dean, Graduate Studies in the student's home Faculty.

~~The departmental Graduate Officer will establish a Comprehensive Examination Committee (and advise the student of the membership of the Committee), which will submit an examination to the Graduate Officer or Graduate Committee for approval, where there are written or oral examinations. In certain departments the comprehensive requirement is met by a series of examinations or other special assignments rather than by a single examination. In both cases, such procedures must begin within four academic terms of the student's first enrolment in the PhD program and completed within at least seven academic terms from initial enrolment. Candidates who fail to pass the comprehensive the first time or who are required to complete additional requirements must satisfy the comprehensive requirement of their department within one calendar year after the unsuccessful attempt, provided the decision made at the time of the comprehensive allows for another opportunity. Students who fail to meet these conditions will be required to withdraw.~~

University of Waterloo
SENATE UNDERGRADUATE COUNCIL
Report to Senate
18 June 2018

Senate Undergraduate Council met on 15 May 2018 and agreed to forward the following items to Senate for approval. Council recommends these items be included in the regular agenda.

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

FOR APPROVAL

NEW ACADEMIC PLANS

Faculty of Arts
Human Rights Minor

1. **Motion:** To approve the proposed new minor in human rights as described below, effective 1 September 2019.

Description:
Students enrolled in any degree program may pursue a minor designation in Human Rights.

The Human Rights Minor requires successful completion of a minimum of four academic course units (eight courses) with a minimum cumulative average of 65%, including:

- HRTS 101, HRTS 102, HRTS 201, HRTS 202, HRTS 203, HRTS 301, HRTS 305/INDG 305
- one of the following approved courses:
  - GSJ 102, GSJ 206/LS 206, HIST 221, HIST 321/LS 331, INDG 201/CDNST 201, PACS 318, PACS 324, PHIL 328/LS 352, PSCI 463/LS 463

Rationale: The University of Waterloo has made "interdisciplinarity" one of the pillars of its new strategic planning process. In the humanities and social sciences, human rights is one of the most prominent emerging interdisciplinary fields of study in Canada. Twenty years ago, there were only two academic programs in human rights in this country. Today there are more than a dozen. It is therefore natural that our university should embrace the development of an academic program in human rights.

St. Paul's University College is a natural home for this program. The subject area of human rights fits well with our general focus and campus programming.

St. Paul's has the expertise and the resources to develop and deliver this minor. The Principal was directly responsible for creating one of the earliest human rights programs in Canada at one of the universities in the Maritimes. Other full-time faculty have relevant expertise and an interest in teaching in the program. St. Paul's will commit to ensuring resources are available to support the program fully once approved.

St. Paul's has consulted with those departments whose courses are listed as electives for the program. The proposal has been approved by the Academic Council at St. Paul's.

The Minor in Human Rights contributes to the UDLES in the following ways:

- Providing students with an opportunity for interdisciplinary learning
- Demonstrating how a particular subject can be examined from a variety of methodological approaches
- Providing students with a greater appreciation of diversity
- Exposing students to a global or international way of looking at concepts (notably in HRTS 202, 301 and 305)
- There will be a small experiential learning component in HRTS 301 (a United Nations Human Rights Council [UNHRC] simulation)

A new subject code was created HRTS, which stands for Human Rights. All HRTS courses listed above are new courses. The list of approved courses is taken from existing courses.

A student cannot complete the Minor in Human Rights in a single year but could complete it in two academic years. A student must complete HRST 101 (Introduction to Human Rights) before doing most of the other required courses. If HRTS 101 and 102 (Human Rights Codes, Commissions, and Policies) were completed in the fall and winter terms of a given year, a student would be able to access the remaining six courses in the fall and winter terms of the following year. Students can take HRTS 101 as late as their 3A term and still complete the Minor by the end of 4B.

CHANGES TO ACADEMIC PLANS

Faculty of Arts
French Teaching Specialization

2. **Motion:** To approve the following changes to the French teaching specialization: (a) clarifying restrictions around plan combinations; and (b) removing the requirement to complete a BEd degree at Nipissing University (or elsewhere) in order to have the specialization recognized on a student's diploma, effective 1 September 2019.

Description:
Current calendar text can be found at: http://ugradcalendar.uwaterloo.ca/page/ARTS-Honours-French.

Calendar text with revisions in line (strike out = deleted text, bold = new entry).

French Teaching Specialization
…
Notes

1. The French Teaching Specialization (FTS) is only open to students majoring in the Honours French academic plan. **This specialization may not be taken in combination with any other major or Arts and Business.**
2. ~~This is a consecutive Bachelor of Arts/Bachelor of Education program. In order to graduate with a FTS designation, students must complete all requirements prior to graduating from the University of Waterloo at the end of Year Four and from Nipissing University at the end of Year Six. Students graduate with an Honours Bachelor of Arts (BA) degree from the University of Waterloo and a Bachelor of Education (BEd) degree awarded by Nipissing University. Students not intending to complete the BEd degree at Nipissing University are not eligible to graduate with the FTS designation.~~
2. **Students who graduate from the University of Waterloo with the French Teaching Specialization are guaranteed admission to a Bachelor of Education program at Nipissing University, according to the Waterloo-Nipissing FTS agreement. Students who choose not to attend Nipissing University will still receive the French Teaching Specialization designation.**

3. Students must achieve a cumulative major average of at least 75% in all French courses counted towards their Honours French major, including other courses listed in the specialization's requirements.
4. Students who have completed courses towards this specialization but are not able to sustain the required 75% major average but are still eligible for Honours standing will normally be allowed to continue in the Honours French major but without the specialization.
5. The Education courses have prerequisites: PSYCH 101/PSYCH 101R for PSYCH 212/PSYCH 212R and SOC 101/SOC 101R for SOC 207.
6. Students may enrol in either the French Teaching Specialization or the Intensive French and Francophone Literatures and Cultures Specialization, but not both.

Rationale: The addition of text in Note 1 formalizes current practices in the Department and provides transparency to students. Students enrolled in the French Teaching Specialization may not pursue a double major or enrol in Arts and Business. This restriction is in place to prevent students from facing unnecessary academic hardship with these unrealistic plan combinations.

The current calendar requirements as outlined in Note 2 mean that only students who choose to attend the Faculty of Education at Nipissing University are awarded the French Teaching Specialization (FTS) designation on their diploma. The proposed change means that all Waterloo students having completed the FTS requirements will receive an FTS degree, regardless of whether or where they choose to attend teacher's college. This change will recognize the fact that students have completed all of the University of Waterloo's required elements for an FTS degree (extra courses, mandatory third year at one of our francophone university partners, and 160 hours of classroom volunteer experience).

The Waterloo-Nipissing FTS agreement outlines the conditions for the guaranteed admission of FTS students into the Nipissing BEd, but does not stipulate anything regarding the FTS designation on the Waterloo BA degree. It was a department decision, when the program was first launched, to add this note to the calendar. The proposed change responds to students' requests that the additional elements required by the Specialization be recognized on their diploma. This change will also align the FTS program with a similar plan in the Faculty, the Fine Arts Teaching Preparation Specialization, which awards the specialization even if students do not attend teacher's college at Nipissing. Nipissing University has been contacted and is fully supportive of the proposed change to Note 2; there will be no change to the Waterloo-Nipissing FTS Agreement.

Faculty of Mathematics
Math/FARM online

3. **Motion:** To approve the offering of a fully online Math/Financial Analysis and Risk Management (Math/FARM) degree, effective 1 September 2019.

Description and Rationale: The online Math/FARM degree is intended to be identical in content and course offerings to the existing on-campus degree. Most of the online courses required for this program either exist or are in the process of being developed. The traditional sequence of the degree may be modified slightly, if necessary, to accommodate the development of new online courses.

The demand for this degree, in particular, from international students is very high. For 2018, there were more than 1,600 applicants for a target of 125 admitted students. There is an expectation that the demand for the on-campus degree will translate into registrations for the online degree.

Despite anticipated demand, the intention is to start with a very small cohort (e.g. five students) in order to allow the staged development of the remaining courses, provide time to assess and respond to differences in offering the degree online, and ensure there is not an undue burden on any of the departments involved in

offering the courses required for the degree. The initial students will enroll in existing online sections to further offset start-up costs.

There has been consultation, and there is support, within the Faculty of Mathematics and Faculty of Arts. For more detailed information on the online degree, see Attachment #1.

Mario Coniglio
Associate Vice-President, Academic

/rmw

Effective September 1, 2019
To approve the Math/Financial Analysis and Risk Management (FARM) online regular degree. A motion will be brought forward at a later date to add co-op once the co-op feasibility study has been completed.

Rationale: Given the expense, effort, reputational risk, and logistical overhead associated with online degrees, why should the Faculty of Mathematics consider an online degree especially in the presence of an abundance of applicants for its on-campus degrees?

There are two driving reasons and then a host of advantages that come with the digital assets and online course offerings that accompany the degree.

Impact
Consider the case of actuarial science and risk management in Indonesia. Indonesia has a population of roughly 260,000,000, a growing middle class seeking life, casualty, property and health insurance, and a newly introduced crop insurance program supporting 27,000,000 rice farmers. An acute and chronic shortage of actuaries and risk professionals have left the country exposed to substantial risk from a shortage of skilled professionals who can manage insurance programs. The provision of in-country training, resources and credentialing has the possibility of impacting tens of millions of people in Indonesia alone.

Future Proofing
There has been a dramatic growth in digital assets whether as textbook replacements, stand alone courses or wholly online credentials. For example, the publishing house Pearson intends to spend well over a billion dollars in the current fiscal year in the creation, maintenance and acquisition of digital assets. Georgia Tech's Computer Science program, ranked 21st in the world in the QS rankings, now offers a highly regarded online Master of Science in Computer Science with more than 6400 students enrolled in spring 2018. Where will Waterloo stand among the online competition in ten years?

Among the side effects of the degrees are a large number of advantages because of the availability of digital assets and online courses. For students, these include the opportunity to review content presentation on demand, lack of classroom distractions for second language learners, flexibility in timetabling, the opportunity to see some things that cannot be done on a board, improved learning the Testing Effect, and dramatically reduced textbook costs. For instructors and departments, the advantages include flexibility in timetabling and teaching assignments, broader choice for students, expanded audiences, and the opportunity to experiment pedagogically through alternate presentations, flipped classes or blended classes. Cumulatively, these amount to significant gains for the University.

Why FARM?
FARM has high demand and a large number of international students, so on the face of it, applicant interest that may turn into registered students. For the entering class of 2018, there were more than 1600 applicants for a target of 125 admitted students. Courses are distributed across departments and so do not impose an onerous burden on any one specific academic unit. The Mathematics and Business Group is strongly supportive. The Dean of Arts and the relevant departments have also provided their support.

Specific Concerns

Academic Integrity
This has been one of the most frequently expressed concerns. Three broad principles will be supported by specific actions. The broad principles, which apply equally to the classroom, are listed below.

1. *Create a culture of academic integrity.*
2. *Establish multiple check points for detection.*
3. *Support for highly stressed students.*

As an example of a specific action, brief, recorded video interviews as part of the assessment process when matched against exam centre photographs and government issued ID will reduce the likelihood of impersonation.

Resources
Most of the courses needed for this online degree have either already been created or are in the process of being developed. The only courses that are taken in the first two years that will not be completed by

the start date are CS 115 and CS 116. These will be developed a year later. The traditional sequence of the program will be slightly modified in terms of the ordering of courses to accommodate for this for the first year.

Financial Information

Since most of the online courses required for this program will already be scheduled, and we aim to have a small number of students initially who can be enrolled in existing online sections, there is no significant new cost for the program. The tuition paid by these students should be more than sufficient to pay for whatever costs arise (eg. extra invigilation of exams and counselling support).

Program Content

It is intended that the online degree be identical in content and course offerings to the existing on campus degree. The current degree requirements are provided below.

Math/Financial Analysis and Risk Management (FARM)

Students in this plan must fulfil all the requirements in Table I and Table II and the following specific requirements along with four academic milestones which must be completed at or before specified times:

One of
MATH 237 Calculus 3 for Honours Mathematics
MATH 247 Calculus 3 (Advanced Level)

All of
ACTSC 231 Introductory Financial Mathematics
ACTSC 371 Introduction to Investments
ACTSC 372 Corporate Finance
AMATH 350 Differential Equations for Business and Economics
CS 330 Management Information Systems
STAT 334 Probability Models for Business and Accounting or (STAT 330 Mathematical Statistics and STAT 333 Applied Probability)
STAT 371 Applied Linear Models and Process Improvement for Business – approved at April 2018 SUC

One of
ACTSC 446 Mathematics of Financial Markets
MATBUS 470 Derivatives

One of
CO 250 Introduction to Optimization
CO 255 Introduction to Optimization (Advanced Level)

One of
CS 335 Computational Methods in Business and Finance
CS 476 Numeric Computation for Financial Modeling (Note: CS 476 may require additional courses as prerequisites.)

All of
AFM 101 Introduction to Financial Accounting
AFM 102 Introduction to Managerial Accounting
AFM 131 Introduction to Business in North America – approved at April 2018 SUC
COMM 101 Introduction to Financial Markets – approved at April 2018 SUC
COMM 231 Commercial and Business Law for Mathematics Students
ECON 101 Introduction to Microeconomics
ECON 102 Introduction to Macroeconomics

One additional 300- or 400- level math course. – approved at April 2018 SUC

All of the courses required for one of the two specialization choices below.

Chartered Financial Analyst Specialization

All of
CO 372 Portfolio Optimization Models
MATBUS 471 Fixed Income Securities

All of
ECON 344 Marketing 1: Principles of Marketing and Consumer Economics (course will be renamed MGMT 244 pending approval) – approved at April 2018 SUC`
COMM 321 Intermediate Accounting for Finance
COMM 421 Financial Statement Analysis
COMM 433 Income Tax for Finance students

One of
ECON 206 Money and Banking I
ECON 207 Economic Growth and Development I
ECON 290 Models of Choice in Competitive Markets

One of
HRM 200 Basic Human Resources Management
MSCI 211 Organizational Behaviour
PSYCH 238 Organizational Psychology

Professional Risk Management Specialization

All of
AMATH 331/PMATH 331 Applied Real Analysis
CS 338 Computer Applications in Business: Databases
MATBUS 471 Fixed Income Securities

One of
ACTSC 445 Quantitative Enterprise Risk Management
MATBUS 472 Risk Management

One of
STAT 340 Computer Simulation of Complex Systems
STAT 341 Computational Statistics and Data Analysis

One of
CO 370 Deterministic OR Models
CO 372 Portfolio Optimization Models

One additional course (.50 unit) labelled BUS, COMM, ECON, HRM, or MSCI.

Two additional non-math courses (1.0 unit).

Milestones
1. Students receive $1,000,000 CAD in a virtual brokerage account and they use this cash during their study to manage a portfolio which includes stocks, bonds, options, futures, currencies, and other securities from over 55 exchanges in over 30 countries. Students will be required to trade various securities, engage in various trading strategies and portfolio allocation strategies. Each milestone comes with explicit deliverables that students must submit electronically and meet to receive credit. The first milestone cannot be completed before eight months from the date of their first trade has elapsed. The last milestone must be completed in the student's final 4B term, not less than two months prior to the end of the term. No milestone can be submitted within six months of the most recent milestone submission date.

Notes
1. Any Financial Analysis and Risk Management (FARM) student who meets all the course requirements for one of the two specializations, but who does not meet the special major average (SMAV) requirements, will be eligible to graduate in the Mathematics/Business Administration plan, either regular or co-op, as appropriate.
2. W courses are offered by Laurier. See the Laurier Calendar for course details.

MEMORANDUM

May 22, 2018

TO: Members of Senate

FROM: Charmaine B. Dean, Vice-President, University Research

SUBJECT: University Research Chair – Revised Policy

Changes to the Canada Research Chair program implemented last Fall resulted in Tier 1 Chairs having term limits of two terms, each of length seven years. That is, Tier 1 Canada Research Chairs are now renewable only once, whereas previously there was no restriction on renewals.

To recognize our Tier 1 Canada Research Chairs ending their second term who have demonstrated exceptional scholarship and leadership in their field and to support those on an accelerated trajectory at the conclusion of their Chairship, a new pathway to the University Research Chair is being proposed to Senate.

The attached description of a revised policy on University Research Chairs provides a description of this new pathway and the process for approval. This revised policy on University Research Chairs has been developed over recent months and discussed at Deans' Council; it is now ready for Senate discussion and approval.

THE UNIVERSITY OF WATERLOO

University Research Chairs

The University of Waterloo owes much of its reputation and stature to the quality of its professors and their scholarly accomplishments. Waterloo recognizes exceptional achievement and pre-eminence in a particular field of knowledge through the designation 'University Research Chair'.

University Research Chair

A faculty member with the University Research Chair title will receive either an annual stipend of $10,000 or a teaching reduction of one course per year, allocated to the Department/School, for the duration of the University Research Chair appointment. The University Research Chair title and benefits will be relinquished if a Canada Research Chair or other major research chair is awarded. It is anticipated that there will be a limited number of University Research Chairs; at steady state, the intention is to make at most five appointments each year. The number of appointments will be reviewed annually by the Vice-President, Academic & Provost in consultation with Deans' Council. A title may be held for up to seven (7) years, with the possibility of a re-nomination.

The selection process is as follows:

1. A faculty Dean may forward one [Applied Health Sciences, Environment] or two [Arts, Engineering, Mathematics, Science] nominations of CRC-eligible faculty members to the Vice-President, Academic & Provost, who will make the final decision.
2. A nomination must be accompanied by a curriculum vitae and short, non-technical description of the nominee's scholarly contributions, together with any other documentation the Dean considers necessary to make a compelling case.

University Research Chair in recognition of exemplary trajectory after the second term of a Tier 1 Canada Research Chair

A faculty member at the conclusion of the second term as a Tier 1 Canada Research Chair, may also be considered for a University Research Chair. The award recognizes distinguished record of accomplishments and a continued outstanding trajectory of excellence in research and scholarship, as well as research leadership. The successful candidate will receive either an annual stipend of $10,000 or a teaching reduction of one course per year, allocated to the Department/School, for the duration of the University Research Chair appointment, with this support provided by the faculty Dean. The University Research Chair title may be held for up to seven (7) years, and is not renewable.

The selection process is as follows:

1. A faculty Dean may forward nominations for individuals to the Vice-President, University Research, who will make the final decision.
2. A nomination must be accompanied by a curriculum vitae and short, non-technical description of the nominee's scholarly contributions, together with any other documentation the Dean considers necessary to make a compelling case of exceptional

achievement over the term of the Tier 1 Canada Research Chairship as well as an accelerated trajectory in the final years of the Chairship.

The Vice-President Academic & Provost will consult with the President of the Faculty Association before announcing any University Research Chair appointments.

Report of the Vice-President, University Research to Senate

June 2018

Research Funding

As mentioned at May Senate meeting the total sponsored research funding for 2017/18 is just about the $225M mark, precisely $224,251,365. Current funding represents a 12% increase over last year. Appendix A provides information on total research funding over the past 10 years, as well as the distribution of sponsored research funding in Y17/18.

Research Partnerships

Waterloo has become the second Canadian university accepted as a member of the University-Industry Demonstration Partnership (UIDP). The UIDP is an American-based organization of top universities and research-intensive corporations. Waterloo was invited to apply for membership based on our research strength, our reputation for working with industry, and our ability to contribute to best practices; other members include University of Toronto, Princeton University, MIT, Harvard University, Caltech, Lockheed Martin, SONY, Toyota. https://www.uidp.org/

International Research and Partnerships Highlights

1. Collaborative Research Program for Artificial Intelligence and Connected Autonomous Driving - Collaborative Research Initiative with Qingdao Academy of Intelligent Industries (QAII) and State Key Laboratory for Management and Control of Complex Systems (SKL-MCCS) China
   PI: Amir Khajepour, Mechanical and Mechatronics Engineering

   Funding: $9 million in total. University of Waterloo to contribute $4 million to build a new autonomous lab facility. QAII and SKL-MCCS will collectively provide up to $5 million CDN ($1 million per year for 5 years) to support collaborative research activities. (Administrative agreement pending).

2. Mitacs Globalink Research Awards

   Waterloo has received 40 Mitacs Globalink Research Awards totalling almost $200,000 since the inception of the award in 2014. This has allowed undergraduate and graduate students from all six faculties to conduct 12 to 24 week research projects internationally at universities around the world. For the 2018-2019 fiscal year Waterloo has already surpassed awards for all previous years with 10 Globalink Research Awards, totalling $52,500 thus far.

ORF-RI results (since April, 2018):

Grit Liebscher was awarded $40,000 from ORF-RI for the Social Interaction, Language and Culture Laboratory (SILC).

ORF-RE results:

On September 25, 2017, the University of Waterloo submitted 13 Waterloo-led applications to the MRIS Ontario Research Fund –Research Excellence (ORF-RE) for a total of $35,810,061 in requested funds

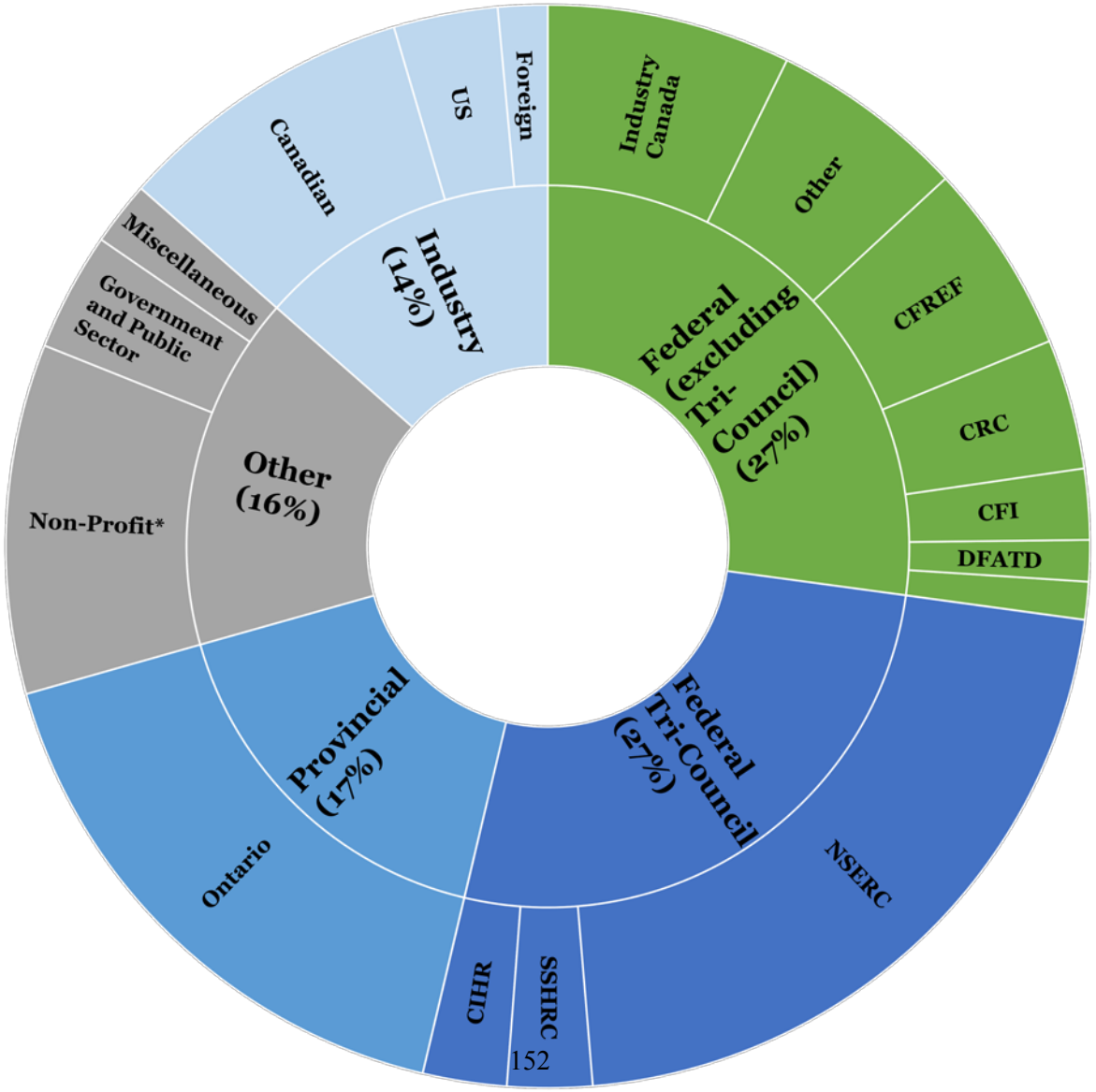
(direct costs = $25,578,615; indirect costs = $10,231,446). Four of the 13 applications were successful with $12,141,681 awarded of $35,810,061 requested. The successful applicants include:

- David Blowes = $4,000,000
- Wendi Adair = $1,000,000
- Ali Safavi-Naeini = $4,000,000
- Hamid Tizhoosh = $3,141,681

Thirteen applications were submitted externally with Waterloo Co-I's for a total of $6,829,886 (direct costs = $4,878,490; indirect costs = $1,951,396) in funding that could come to Waterloo if successful. Of these, the successful applications yielded at total of $1,956,446; direct costs = $1,397,461; indirect costs = $558,985 in requested funding. The Co-I's from Waterloo for these applications are listed below as well as the funding amounts, the lead institutions identified in parenthesis.

- Hyung-Sool Lee (University of Guelph) = $394,800
- Josh Neufeld (Western University) = $992,040
- Paul Parker (Wilfrid Laurier University) = $228,200
- Carolyn Ren (University of Toronto) = $411,406

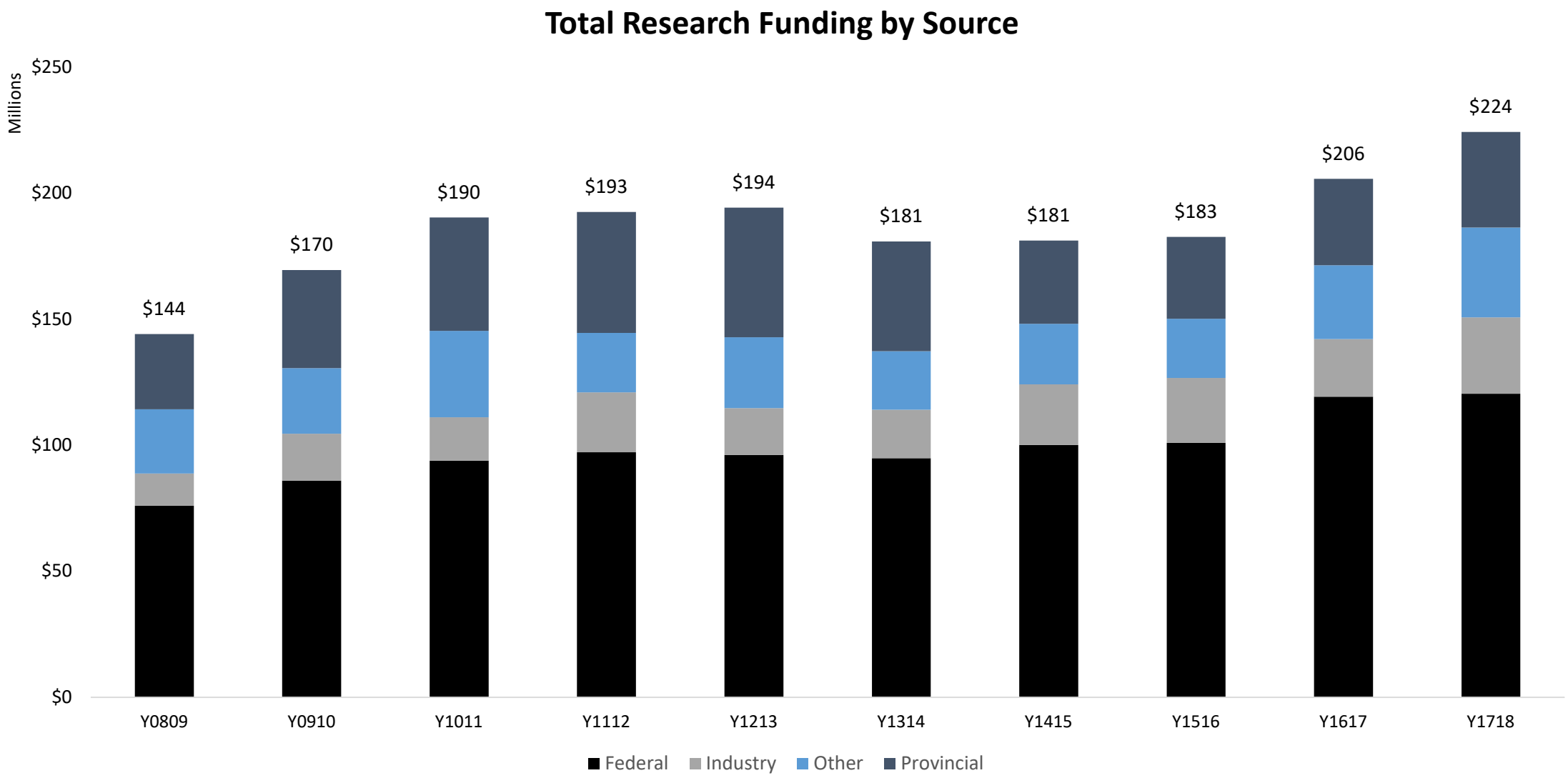
Distribution of Sponsored Research Funding in Y1718



Canada First Research Excellence Fund (CFREF)
Canada Research Chairs (CRC)
Canadian Foundation for Innovation (CFI)
Department of Foreign Affairs, Trade and Development (DFATD)
Natural Sciences and Engineering Council of Canada (NSERC)
Social Sciences and Humanities Research Council (SSHRC)
Canadian Institutes of Health Research (CIHR)

* 54% of non-profit funds are internal UW contributions

Appendix A


Total Research Funding by Source
Millions
$250
$200
$150
$100
$50
$0
$144
$170
$190
$193
$194
$181
$181
$183
$206
$224
Y0809
Y0910
Y1011
Y1112
Y1213
Y1314
Y1415
Y1516
Y1617
Y1718
Federal
Industry
Other
Provincial

UNIVERSITY OF WATERLOO
FACULTY OF ARTS

To: Senate

From: Douglas Peers, Dean
Faculty of Arts

Date: 25 May 2018

Re: Proposed Changes to the Constitution of the Faculty of Arts

Motion: Pursuant to Section 15 of Senate Bylaw 1, that Senate approve the revised Constitution of the Faculty of Arts.

Rationale: The proposed changes updates our Faculty's constitution, brings it in line with current governance documents and nomenclature, and sets a new meeting schedule intended to increase participation in Faculty governance. Many of the changes are not substantive. We have revised it by removing references to positions, committees and officers that no longer exist, and have updated it to include current Faculty standing committees and their membership. We have revised the membership for some of the committees to ensure equal representation for departments and schools. In addition, we have made explicit the role of the Faculty Council to recommend and approve significant changes to the structure of Faculty departments and schools and to their names, as well as explicitly noting its role in strategic planning.

The substantive changes involve the scheduling of meetings, and specifying voting rights when it comes to administrative and personnel responsibilities. As far as scheduling meetings are concerned, we have moved away from the current situation where there is in theory a meeting scheduled each month, but which is very often cancelled a week ahead due to the fact that nothing had been taken off the consent agenda. In order to allow our colleagues to plan better, and to create fewer but more certain and more meaningful Faculty Council meetings, we have set out a schedule of three meetings a year. We expect that the committees who report to AFC will coordinate their activities to meet the dates for these meetings.

It is our intention that these three meetings will have more robust and prearranged agendas (e.g. reports on the state of the Faculty, updates on the strategic plan, and presentations of broad Faculty interest). This will encourage wider participation by adding a more strategic and consultative role for Arts Faculty Council. In light of the shift towards a more strategic and planning role, we have added two staff members with

voting rights: the Executive Officer of the Faculty and the chair of the Arts Staff Advisory Council.

Because we will be relying less on a consent agenda, we have dispensed with a Faculty Council Executive and have instead delegated agenda setting to the Dean and the elected Chair and Deputy Chair of Arts Faculty Council. We have made sure that there are provisions for extraordinary meetings to be called by members of Arts Faculty Council.

The other major change is that we have had to adjust voting rights for matters involving conditions of employment and administrative matters. The Arts Constitution has historically recognized faculty members of the AFIW as having full voting rights. This became an issue when the latest MOA requires faculty-level APR guidelines to be approved by Faculty Councils. We have amended voting rights to specify that AFIW members have full voting rights in academic matters, but cannot vote on administrative and employment-related business.

Faculty of Arts Constitution Consultations to date

- In light of the changes to the MOA, the Dean and the Chair of Arts Faculty Council decided in late 2016 to move ahead with revisions to our Constitution
- The need for a revised Constitution discussed at Arts Faculty Council, 9 May 2017
- A detailed review of our constitution was initiated in the summer of 2017 and preliminary discussions held with the Secretariat, the management group in the Faculty of Arts, and chairs of the major committees
- The objectives and requirements for a revised constitution discussed at several General Group meetings in October and November 2017
- Meetings held with representatives from the AFIW in October 2017 to discuss proposed revisions
- Meetings held with the Secretariat in November 2017 to review new constitution
- Arts Faculty Council Executive approved on 28 November 2017 the distribution of the proposed constitution to Arts Faculty Council at their December 2017 meeting
- Draft of the Constitution presented to Arts Faculty Council for information on 12 December 2017. Discussion was encouraged and feedback sought with the intention of bringing it to a vote in late winter 2018
- Further discussions with the Deans of the AFIW held in February and March 2018
- Revised constitution brought to Arts Faculty Council Executive on 27 February 2018
- Constitution with minor amendments approved at Arts Faculty Council on 13 March 2018. Approved unanimously.

CONSTITUTION

of the

FACULTY OF ARTS

at the

UNIVERSITY OF WATERLOO

I. PREAMBLE

The Faculty of Arts at the University of Waterloo (the "University") is committed to the discovery, application, and communication of knowledge and creativity across the humanities, social sciences, and creative arts to benefit the peoples, economies, and cultures of Canada and the world.

II. FACULTY and FACULTY COUNCIL

1. There shall be a unit of the University called the Faculty of Arts (the "Faculty").

2. The Faculty shall consist of such departments and schools as may be approved in accordance with the Act.

3. The plenary organ of the Faculty shall be the Faculty of Arts Faculty Council ("Faculty Council").

4. The principal officers of the Faculty are the Dean and the Chairs/Directors of its Departments and Schools as defined by university policies 40 and 45

5. Faculty Council shall consist of the following, all as voting members except as may otherwise be provided in this Constitution:

   (a) <u>*ex officio* from the University</u>

   The President of the University
   The Vice-President, Academic & Provost
   The Associate Vice President, Graduate and Postdoctoral Studies
   The Associate Vice-President, Academic
   The Academic Deans of each of the Affiliated and Federated Institutions of Waterloo ("AFIW")
   The Dean of the Faculty
   The Faculty Relations Manager (Arts) in the Department of Co-operative Education and Career Action (non-voting)
   The University Librarian or delegate

The University Registrar or delegate
The Executive Officer of the Faculty of Arts
The Chair of the Arts Staff Advisory Council

(b) <u>From other faculties</u>

One representative from each of the other faculties in the University

(c) <u>From each Department or School</u>

All professors, associate professors, assistant professors, and lecturers holding a regular, full-time faculty appointment in the Faculty

(d) <u>From AFIW</u>

All professors, associate professors, assistant professors, and lecturers holding a regular, full-time faculty appointment in a program in any of the AFIW institution that is accountable to Arts Faculty Council for academic oversight

(e) <u>Students</u>

Three full-time undergraduate students registered in a program offered through the Faculty, appointed by the Arts Student Union
Three full-time graduate students registered in a program offered through the Faculty, appointed by the Graduate Student Association

AFIW Academic Deans and members of Faculty Council identified in paragraph II.4(d) above shall vote at meetings of Faculty Council only on matters related to academic programs and plans, and not on matters related to administrative and operational considerations in the Faculty (including, without limitation, personnel management issues including appointments, tenure and promotions; structural changes in the Faculty; and Department and School name changes). The agenda for each meeting will explicitly indicate those matters upon which AFIW may not vote. The decision as to whether they can speak to any matters will be up to the chair. Notwithstanding this, deans, chairs, and directors of academic units in the Faculty of Arts and in the AFIW will consult with each other on those administrative and operational considerations that have a bearing on those academic programs and plans in which there is a shared interest.

6. In addition to the members of Faculty Council named in section II.4 above, Faculty Council may invite representatives of other departments and schools of the University to attend and participate in meetings of Faculty Council on such terms as Faculty Council may determine.

7. Except as may otherwise be determined by Faculty Council, meetings of Faculty Council shall be open. Observers may be given the privilege of the floor at the discretion of the chair of the

meeting. Faculty Council may, on 48 hours' notice, close a meeting to any or all categories of spectators. Student members of Faculty Council shall not participate in meetings or parts of meetings in which individual student cases are discussed. .

8. Faculty Council shall meet at least three times annually ("Regular Meetings"), normally on the third Tuesday in November, March, and May, at such time as may be determined by the Dean, the Chair of Faculty Council, and the Deputy Chair of Faculty Council, acting together. The March meeting (the "AGM") shall be the annual general meeting of Faculty Council. Elections to Council positions will be held at and annual reports will be delivered to the Annual General Meeting
9. Additional meetings ("Special Meetings") may be held either at the joint call of the Dean, Chair of Faculty Council, and Deputy Chair of Faculty Council, or within 15 working days of receipt by either the Chair or Secretary of Faculty Council of one of the following, indicating the proposed purpose of such Special Meeting:

   (a) the written request of the Dean of the Faculty,
   (b) the written request of the Chair of Faculty Council, or
   (c) a petition signed by not less than 15 members of Faculty Council, at least half of whom shall hold regular full-time continuing appointments in departments or schools of the University of Waterloo.

   Items on the agenda for any Special Meeting shall be restricted to those matters that cannot be postponed until the next Regular Meeting.

10. A quorum at all meetings of Faculty Council shall consist of 25 members of Faculty Council, present either in person, by teleconference, or by videoconference. For the purposes of identifying the members of Faculty Council so as to calculate quorum, *ex officio* members of Faculty Council as listed in paragraph II.4(a) above, AFIW members, and representatives from other faculties as listed in paragraph II.4(b) above, shall not be counted. Except as otherwise provided in this Constitution, all members of Faculty Council shall have one vote on any matter coming before Faculty Council for determination. Proxy votes shall not be permitted.

11. Meetings of Faculty Council shall be conducted in accordance with Robert's Rules of Order (to the extent that Robert's Rules of Order is not inconsistent with this Constitution) and such bylaws as may be adopted by Faculty Council pursuant to section XII.1 below. Except as otherwise provided for in this Constitution, notices of meetings with agenda and all relevant documentation (including without limitation the full text of any major motions to be made at the meeting, full reports from any standing or *ad hoc* committees that wish to report or make recommendations to Faculty Council together with the text of such recommendations, and written reports from any other body or individual wishing to raise a matter for discussion at the meeting) shall be circulated to members of Faculty Council by email, and posted to the website of the Dean of the Faculty, at least 5 working days in advance of its meetings.

12. Faculty Council shall have the following powers, duties and responsibilities:

    (a) Subject to the approval of the Senate of the University (the "Senate"), to approve general principles and standards with respect to the programs and courses of study in the Faculty and the conditions of admission into, and continuation within, these courses of study.

    (b) To consider and approve new academic programs and courses, and changes to existing curriculum.

    (c) To consider and report to Senate upon such matters related to academics or scholarship affecting the Faculty as the Faculty Council may consider appropriate.

To appoint such standing and *ad hoc* committees of Faculty Council as it shall determine, to establish the terms of reference of such committees, to populate such committees, and to delegate to such committees the powers and responsibilities that Faculty Council itself possesses.

    (d) To conduct long range academic planning within the Faculty

    (e) To recommend to Senate any changes in the departmental structure including departmental and school names

    (f) To formulate and express opinions in the name of the Faculty Council on matters deemed by Faculty Council to be of concern to it, and to forward such expressions of opinion to the appropriate body within the University.

    (g) To review and approve Faculty Performance Evaluation Guidelines.

    (h) To make rules and regulations governing its proceedings and the proceedings of any standing or *ad hoc* committees of Faculty Council.

13. The agenda for any meeting of Faculty Council will be prepared jointly by the Dean, the Chair of Faculty Council, and the Deputy Chair of Faculty Council. Relying on historical patterns and in anticipation of routine business, the Dean, the Chair of Faculty Council, and the Deputy Chair of Faculty Council will use their best efforts to generate a work plan for Faculty Council, that will include agendas for each regular meeting of Faculty Council for the ensuing year, to be tabled at the AGM. Provided that notice is given to the Chair of Faculty Council not less than fourteen calendar days before any Regular Meeting of Faculty Council, any member of Faculty Council may request that an additional item be placed on the agenda for any Regular Meeting. Any anticipated motions that are submitted are to be accompanied by supporting materials. The chair will determine whether such a request will be entertained.

14. The Secretary of Faculty Council shall maintain a complete file of all minutes of meetings of Faculty Council and each of its standing and *ad hoc* committees, and, subject to such exceptions

as may be established through University policy or at law, such file shall be open to inspection by any member of Faculty Council on request.

III. OFFICERS

The Dean

1. The senior executive officer of the Faculty shall have the title "Dean of Arts" (the "Dean").

2. The Dean is an officer of the University and is appointed in accordance with University Policy 45, The Dean of a Faculty, as it may be amended from time to time, or any document in substitution therefor.

3. Reporting to the Vice-President, Academic & Provost, the Dean leads the Faculty with respect to curriculum development, teaching, learning, research, and fostering its best interests. The Dean represents the Faculty and acts on its behalf in any administrative and ceremonial matters pertaining to the Faculty as a whole. The Dean manages the Faculty, including matters relating to resourcing, resource allocation and Faculty development, and performs such other duties or functions as required for the academic program of the Faculty.

4. On the recommendation of the Honours and Awards Committee established pursuant to section VIII.1 below, the Dean has the authority to submit names to the Senate Honorary Degrees Committee for the awarding of honorary degrees and for distinguished professor *emeritus* appointments, and to the Senate Honorary Member of the University Committee for awarding of the designation "honorary member of the university."

The Chair and Deputy Chair of Faculty Council

5. At the AGM in each year, Faculty Council shall elect one of its members to serve as Chair (the "Chair") and one of its members to serve as Deputy Chair (the "Deputy Chair"). The Chair and Deputy Chair shall serve for two years and may be re-elected for an additional two year term.

6. In the case of all elections required to be held pursuant to section III.5 above, the Secretary of Faculty Council will conduct the election. With respect to elections of Chair and Deputy Chair to be held at the AGM, the Secretary of Faculty Council shall conduct the elections in accordance with the following rules:

   (a) Nominations for Chair and Deputy Chair shall be solicited by the Secretary from members of Faculty Council for presentation at the AGM.
   (b) Each candidate nominated for either Chair or Deputy Chair must indicate to Faculty Council their willingness to stand or, if they are not in attendance, must provide their nominator with written consent to stand.

(c) In the case of a contest for the position of either Chair or Deputy Chair, balloting will proceed by secret ballot at the AGM, and the Secretary of Faculty Council shall act as sole scrutineer.

7. The duties of the Chair shall consist of chairing all meetings of Faculty Council, and such other duties as may be assigned to the Chair by this Constitution, or by the bylaws and resolutions of Faculty Council. In the absence of the Chair, the Deputy Chair shall assume all duties of the Chair. In the absence of both the Chair and the Deputy Chair, Faculty Council will elect a presiding officer for the meeting from among those members of Faculty Council in attendance at that meeting

<u>The Secretary of Faculty Council</u>

8. The Secretary of Faculty Council (the "Secretary") is appointed by the Dean from among staff members in the Faculty, and is a non-voting member of Faculty Council. In the absence of the Secretary, the Chair will appoint an acting Secretary from among the membership of Faculty Council in attendance at the meeting, on the express understanding that an acting Secretary in such a situation will not lose their voting rights at the meeting at which they serve.

9. The duties of the Secretary shall consist of:

   (a) Giving notice of all meetings of Faculty Council in accordance with section II.9 above, including circulation of all required documentation and arranging for posting such documentation to the Dean's web site.

   (b) Maintaining the attendance roll for all meetings of Faculty Council.

   (c) Recording the minutes of all meetings of Faculty Council, and maintaining a file of minutes of all meetings of Faculty Council and its standing and *ad hoc* committees in accordance with section II.12 above.

   (d) Such other duties as may be assigned to the Secretary by this Constitution, or by the bylaws and resolutions of Faculty Council.

IV. STANDING and *AD HOC* COMMITTEES – GENERAL

1. Except as may otherwise be provided in this Constitution and subject always to the bylaws of Senate as they may be established from time to time, Faculty Council shall have the power, pursuant to paragraphs II.10(c) and (f) above, to appoint such standing and *ad hoc* committees of Faculty Council as it shall determine, to delegate to such committees the powers and responsibilities that Faculty Council itself possesses, and to make rules and regulations governing the proceedings of such committees.

2. Without limiting the generality of section IV.1 above, Faculty Council shall have the power to determine the composition and terms of reference of any standing or *ad hoc* committee it may establish, and to appoint the initial members of such committees.

3. No *ad hoc* committee of Faculty Council shall remain a committee of Faculty Council for more than two years from the date of the meeting of Faculty Council at which it was established, unless its composition and terms of reference are incorporated into this Constitution by amendment.

4. Unless otherwise determined by a resolution of Faculty Council, the quorum at any meeting of a standing or *ad hoc* committee of Faculty Council shall be a simple majority, present in person, by teleconference or by videoconference. All members of any standing or *ad hoc* committee of Faculty Council shall have one vote on any matter coming before such committee for determination. Proxy votes shall not be permitted. Except as may otherwise be determined by the relevant standing or *ad hoc* committee of Faculty Council, all committee meetings shall be open.

5. Except as may otherwise be provided in this Constitution, and unless otherwise determined by resolution of Faculty Council, any standing or *ad hoc* committee of Faculty Council shall, at its first meeting, elect from among its membership a chair and a secretary, both of whom shall retain all rights of participation in and voting at all meetings of such committee. Except as may otherwise be provided in this Constitution, such chair and secretary shall serve two year terms in their respective positions, and shall be eligible for re-election.

6. The chair of any standing or *ad hoc* committee shall set the agenda for, and call and preside at, all meetings. The secretary of any standing or *ad hoc* committee shall give notice of all meetings, circulate all meeting materials (including the agenda and any reports and proposed motions) by email to all members of the committee at least 5 working days in advance of its meetings, and keep the minutes and attendance roll for all committee meetings. So as to allow the Secretary to fulfill the responsibility referred to in paragraph II.12 above, the secretary of any standing or *ad hoc* committee shall provide a true copy of all minutes of meetings of the committee to the Secretary as soon as reasonably practicable after such minutes are approved by the committee.

7. It shall be inherent in the powers of every standing committee of Faculty Council that it may appoint such sub-committees as it shall in its discretion determine, to establish the terms of reference for such sub-committees, to populate such sub-committees, and to delegate to such sub-committees the powers and responsibilities that such standing committee itself possesses.

V. UNDERGRADUATE AFFAIRS GROUP

1. There shall be a standing committee of Faculty Council to be called the "Undergraduate Affairs Group" (the "UGAG").

2. The UGAG shall be composed of the following as members:

   (a) The Associate Dean, Undergraduate Programs in the Faculty, *ex officio*, who shall be chair
   (b) The Associate Dean, Undergraduate Students in the Faculty, *ex officio*
   (c) The Associate Dean, Planning & Co-op in the Faculty, *ex officio*.
   (d) The chair of the Examinations and Standings Committee established pursuant to section XI.1 below, *ex officio*, unless such chair already holds an *ex officio* seat on UGAG.
   (e) The chair of the Admissions Committee established pursuant to section X.1 below, *ex officio*, unless such chair already holds an *ex officio* seat on UGAG.
   (f) The Academic Deans or designates from each of the AFIW, *ex officio*
   (g) The Associate Chair, Undergraduate from each Department or School in the Faculty of Arts at the University of Waterloo, *ex officio*. In instances where a department may host more than one academic plan, additional non-voting representatives may attend meetings but the principle remains that there is one vote for each department, school, affiliated college or university
   (h) The academic directors or equivalents of undergraduate students in interdisciplinary or non-departmentalized academic plans offering the Bachelor of Arts degree (e.g. Arts and Business), *ex officio*
   (i) The Assistant Registrar, Admissions for the Faculty in the Office of the Registrar for the University, *ex officio*.
   (j) As many as three full-time undergraduate students appointed by the Arts Student Union and registered in a program offered through the Faculty, the number of such students to be determined by the Arts Student Union.
   (k) Student representatives shall serve one year terms, and are eligible for renewal.

3. In addition to the members of UGAG named in section V.2 above, UGAG may invite representatives of other departments and schools of the University to attend and participate in meetings of UGAG on such terms as UGAG may determine.

4. UGAG shall have the following powers, duties and responsibilities:

   (a) To receive submissions from departments and schools, sub-committees of UGAG, and individual members of Faculty Council on any matter related to undergraduates and undergraduate study in the Faculty, including without limitation, examinations and promotions, curriculum, program development, and undergraduate advising, and to make recommendations to Faculty Council on any such matter.

   (b) To prepare and promulgate such policies, rules, regulations, procedures, and guidelines as it may consider appropriate for the development, submission, consideration and re-consideration of any submissions contemplated under paragraph V.4(a) above.

   (c) To conduct preliminary investigations and make reports and recommendations to Faculty Council on anything within the mandate of UGAG where such is implicated on the agenda

for any meeting of Faculty Council, or where such is requested by the Dean or any Associate Dean in the Faculty.

VI. GRADUATE AFFAIRS GROUP

1. There shall be a standing committee of Faculty Council to be called the "Graduate Affairs Group" (the "GAG").

2. The GAG shall be composed of the following as members:

   (a) The Associate Dean, Graduate Studies in the Faculty, *ex officio*, who shall be chair
   (b) The Associate Chair, Graduate from each Sub-Unit offering graduate programs, *ex officio*. In instances where a department may host more than one academic program or plan, additional non-voting representatives may attend meetings but the principle remains that there is one vote for each department, school, affiliated college or university
   (c) As many as three full-time graduate students appointed by the Graduate Student Association and registered in a program offered through the Faculty, the number of such students to be determined by the Graduate Student Association. Student members shall serve a one year term, and are eligible for renewal.

3. In addition to the members of GAG named in section VI.2 above, GAG may invite representatives of other units and sub-units of the University to attend and participate in meetings of GAG on such terms as GAG may determine.

4. GAG shall have the following powers, duties, and responsibilities:

   (a) To receive submissions from Sub-Units, sub-committees of GAG, and individual members of Faculty Council on any matter related to graduate students and graduate study in the Faculty, including without limitation admissions, examinations and promotions, curriculum, program development, and graduate student advising, and to make recommendations to Faculty Council on any such matter.

   (b) To prepare and promulgate such policies, rules, regulations, procedures, and guidelines as it may consider appropriate for the development, submission, consideration, and re-consideration of any submissions contemplated under paragraph VI.4(a) above.

   (c) To conduct preliminary investigations and make reports and recommendations to Faculty Council on anything within the mandate of GAG where such is implicated on the agenda for any meeting of Faculty Council, or where such is requested by the Dean or any Associate Dean in the Faculty.

VII. FACULTY COMMITTEE on STUDENT APPEALS

1. There shall be a standing committee of Faculty Council to be called the "Faculty Committee on Student Appeals" (the "FCSA").

2. The FCSA, from which members of the tribunals shall be drawn, shall be composed of the following as members:

   (a) One faculty member of Faculty Council who shall be chair, appointed by the Dean.
   (b) Five faculty members of Faculty Council, appointed by the Dean, one of whom shall be designated vice-chair in case of a conflict.
   (c) As many as two full-time undergraduate students appointed by the Arts Student Union and registered in a program offered through the Faculty, the number of such students to be determined by the Arts Student Union.
   (d) As many as two full-time graduate students appointed by the Graduate Student Association and registered in a program offered through the Faculty, the number of such students to be determined by the Graduate Student Association.

   All faculty members of the FCSA shall serve two year terms, and are eligible for renewal.

3. The FCSA shall have the following powers, duties and responsibilities:

   (a) To exercise the powers, duties and responsibilities vested in faculty committees on student appeals pursuant to Policy 72 of the University, Student Appeals.

   (b) To make reports and recommendations to Faculty Council on anything within the mandate of the FCSA.

VIII. HONOURS and AWARDS COMMITTEE

1. There shall be a standing committee of Faculty Council to be called the "Honours and Awards Committee."

2. The Honours and Awards Committee shall be composed of the following as members:

   (a) The Dean, *ex officio*, as chair.
   (b) The Associate Dean, Research in the Faculty, *ex officio*.
   (c) The Executive Officer in the Office of the Dean, *ex officio*.
   (d) The chair of Arts Staff Advisory Council
   (d) The Research Development Officer in the Office of the Dean, *ex officio*.
   (e) One faculty member of Faculty Council appointed by the Dean from among Sub-Units offering programs in the fine and creative arts.
   (f) One faculty member of Faculty Council appointed by the Dean from among Sub-Units offering programs in the social sciences.

(g) One faculty member of Faculty Council appointed by the Dean from among Sub-Units offering programs in languages and culture.
(h) One faculty member of Faculty Council appointed by the Dean from among Sub-Units offering programs in the humanities.
(i) One faculty member of Faculty Council appointed by the Dean from the School of Accounting and Finance.
(j) One full-time undergraduate student appointed by the Arts Student Union and registered in a program offered through the Faculty.
(k) One full-time graduate student appointed by the Graduate Student Association and registered in a program offered through the Faculty.

All faculty members of the Honours and Awards Committee, other than *ex officio* members, shall serve two year terms, and are eligible for renewal. Student representatives shall serve one year terms, and are eligible for renewal.

3. The Honours and Awards Committee shall have the following powers, duties, and responsibilities:

(a) To recommend to Faculty Council the establishment of such honors and awards to be based in the Faculty as the Honours and Awards Committee may consider appropriate, and to make recommendations to Faculty Council on the terms and conditions on which such honors and awards might be granted. This committee may also be adjudicating those awards

(b) To provide input and guidance to the Dean on names to be considered for recommendation for internal and external awards.

(c) To consider and make recommendations to the Dean on names to be submitted to the Senate Honorary Degrees Committee for the award of honorary degrees.

(d) To consider and make recommendations to the Dean on names to be submitted to the Senate Honorary Degrees Committee for conferring of the title "Distinguished Professor *Emeritus*."

(e) To consider and make recommendations to the Dean on names to be submitted to the Senate Honorary Member of the University Committee for conferring of the title "Honorary Member of the University."

IX. FACULTY TENURE and PROMOTIONS COMMITTEE

1. There shall be a standing committee of Faculty Council to be called the "Faculty Tenure and Promotions Committee" (the "FTPC").

2. The FTPC shall be composed of the following as members:

(a) The Dean, *ex officio*, who shall be chair.
(b) At least five faculty members of Faculty Council identified in paragraph II.4(c) above, elected in accordance with the provisions of University Policy 77, Tenure and Promotion of Faculty Members ("Policy 77"), and serving subject to the conditions and restrictions set forth in Policy 77.
(c) One tenured member of faculty at the University who is not a member of Faculty Council, appointed by the Vice-President, Academic & Provost of the University.
(d) One member of the University Tenure and Promotion Advisory Committee to be appointed by that committee, to serve as a non-voting advisor to the FTPC.

All members of the FTPC, other than *ex officio* members, shall serve three year terms, and are eligible for one renewal.

3. The FTPC shall have the following powers, duties and responsibilities:

(a) To exercise the powers, duties and responsibilities vested in faculty committees on tenure and promotion of faculty members pursuant to Policy 77.

(b) To make reports and recommendations to Faculty Council on anything within the mandate of the FTPC.

X. ADMISSIONS COMMITTEE

1. There shall be a standing sub-committee of Arts Faculty Council to be called the "Admissions Committee."

2. The Admissions Committee shall be composed of the following as members:

(a) The Associate Dean, Undergraduate Students in the Faculty, *ex officio*, who shall be chair.
(b) Director, Arts & Business, ex officio
(c) Director GBDA, ex officio
(d) Assistant Registrar Admissions, *ex officio*
(e) Academic Dean (or designate), St Jerome's University
(f) Academic Dean (or designate), Renison University(g)Registrar's Office admissions officers
(h) Registrar's Office Pathways Manager
(i) Manager Academic Advising Arts Undergraduate Office, ex officio
(j) representative from the School of Accounting and Finance
(k) representative from Centre for Extended Learning
(l) representative from Centre for Cooperative Education and Career Action
(m) Advising Staff from Arts Undergraduate Office
(n) Arts Recruitment Team Members

All members of the Admissions Committee, other than *ex officio* members, shall serve one year terms, and are eligible for renewal.

3. The Admissions Committee shall have the following powers, duties and responsibilities:

   (a) To develop and implement regulations and procedures for the admission of all undergraduate applicants to the Faculty.

   (b) To develop and implement regulations and procedures for evaluating transfer credits.

   (c) To initiate and undertake research on undergraduate admissions as such may be required to support the work of the Admissions Committee, UGAG, Faculty Council, or the Dean.

   (d) To advise in the preparation of admission booklets and information statements for the Faculty.

   (e) To advise UGAG on matters pertaining to University-wide admissions policies.

   (f) To set minimum academic standards for admission considering the Faculty's admission projections and enrolment levels.

   (g) To appraise individual admissions cases, and to hear and appraise appeals from admissions decisions.

   (h) To prepare an annual report for presentation to UGAG and Arts Faculty Council.

XI. EXAMINATIONS and STANDINGS COMMITTEE

1. There shall be a standing sub-committee of UGAG to be called the "Examinations and Standings Committee" ("E&S"). The Dean shall name either the Associate Dean, Undergraduate Students or the Associate Dean, Undergraduate Programs to be responsible for of the operations of E&S.

2. E&S shall be composed of the following as members:

   (a) A faculty member of Faculty Council who shall act as chair, to be appointed by the responsible Associate Dean.
   (b) The Associate Dean, Undergraduate Students or the Associate Dean, Undergraduate Programs who does not have principal responsibility, *ex officio*.
   (c) The Manager of Academic Advising in the Arts Undergraduate Office, *ex officio*.
   (d) The Assistant Registrar, Records Operations on the Office of the Registrar for the University, *ex officio*.
   (e) One faculty member of Faculty Council representing Renison University College, to be appointed by the Academic Dean of Renison University College.

(f) One faculty member of Faculty Council representing St. Jerome's University, to be appointed by the Academic Dean of St. Jerome's University.
(g) Five faculty members of Faculty Council from among those identified in paragraph II.4(c) above, appointed by the Overseer.

All members of E&S, other than *ex officio* members, shall serve one year terms, and are eligible for renewal.

3. The E&S shall have the following powers, duties and responsibilities:

(a) To hear undergraduate student petitions for exception to or relief from Faculty academic regulations, including without limitation dropping or adding courses outside the prescribed drop or add period, registering for courses beyond the normal course load, and changing academic decisions, all in accordance with University Policy 70, Student Petitions and Grievances.

(b) On the request of any of Faculty Council, UGAG, the Dean, an associate dean, or the chair or director of any Sub-Unit, to review any academic decision related to undergraduate students made in the Faculty and to report the results of such review to UGAG.

(c) To devise and recommend to UGAG such policies, procedures and guidelines with respect to undergraduate student academic standing and promotion as the E&S may consider appropriate.

(d) To prepare an annual report for presentation to UGAG.

XII. GENERAL

1. Bylaws of Faculty Council shall be adopted by a super majority (2/3) of the votes cast at a duly constituted meeting of Faculty Council at which a quorum is present. Notice of proposed amendment, repeal or adoption of bylaws of Faculty Council must be given in writing to members of Faculty Council not less than 30 days prior to the meeting at which those proposals are intended to be considered.

2. This Constitution, and any amendments thereto, shall come into force and effect following approval by a two-thirds majority of those present with at least half of those voting holding regular full time appointments in the Faculty of Arts and voting at a duly constituted meeting of Faculty Council called for such purpose and at which a quorum is present, and following subsequent approval by Senate in accordance with its bylaws. Notice of proposed amendments to this Constitution must be given to members of Faculty Council not less than 30 days prior to the meeting at which those proposals are intended to be considered.

3. Once approved pursuant to section XII.2 above, this Constitution shall repeal and replace any and all versions of the Faculty constitution previously in force.

Approved at a meeting of Faculty Council held March 13th, 2018.
*Approved at a meeting of Senate held ** *** 2018.*

University of Waterloo
SENATE
18 June 2018

FOR APPROVAL

1. Delegation of Authority: Chair of the Dean of Applied Health Sciences Nominating Committee

Motion: That Senate grant the Vice-President, Academic & Provost the authority to delegate the role of chair of the Dean of Applied Health Sciences Nominating Committee.

Rationale: The membership of the nominating committee is filled per Policy 45 and the committee has been properly constituted, and Policy 45 prescribes that the Vice-President, Academic & Provost shall serve as chair of decanal nominating committees. With George Dixon currently serving in that office and with Jim Rush commencing his appointment effective 1 July 2018, both parties agree that it would be optimal for the former to serve as chair of the nominating committee to its likely conclusion in Fall term of 2018 or Winter term of 2019.

2. Delegation of Authority: Chair of the Dean of Arts Nominating Committee

Motion: That Senate grant the Vice-President, Academic & Provost the authority to delegate the role of chair of the Dean of Arts Nominating Committee.

Rationale: The membership of the nominating committee is filled per Policy 45 and the committee has been properly constituted, and Policy 45 prescribes that the Vice-President, Academic & Provost shall serve as chair of decanal nominating committees. With George Dixon currently serving in that office and with Jim Rush commencing his appointment effective 1 July 2018, both parties agree that it would be optimal for the former to serve as chair of the nominating committee to its likely conclusion in Fall term of 2018 or Winter term of 2019.