

University of Waterloo
SENATE EXECUTIVE COMMITTEE
Notice of Meeting

Date: Monday 6 May 2019
Time: 3:30 p.m.
Place: Needles Hall, Room 3308

OPEN SESSION	Action
1. Minutes of the 1 April 2019 Meeting	Decision
2. Amendments to Senate Bylaws	Decision
3. Report of the Vice-President, Academic & Provost	Decision
a. Roster of Graduands	
4. Draft 21 May 2019 Senate Agenda	Decision
5. Other Business	
CONFIDENTIAL SESSION	
6. Other Business	

KJJ/ejg
29 April 2019

Karen Jack
University Secretary
Secretary to the Executive Committee

University of Waterloo
SENATE EXECUTIVE COMMITTEE
Minutes of the 1 April 2019 Meeting

Present: Jeff Casello, Tia Driver, Paul Fieguth, Mark Giesbrecht, Feridun Hamdullahpur (chair), Karen Jack (secretary), James Rush, Mark Seasons, James Skidmore, Richard Staines, Bryan Tolson

Regrets: Mungo Marsden, Naima Samuel, Richard Wu

Guest: Jeff Wilson

1. MINUTES OF THE 4 MARCH 2019 MEETING

Members heard a motion to approve the minutes of the 4 March 2019. Giesbrecht and Fieguth. Carried unanimously.

2. BUSINESS ARISING

There was no business arising.

3. EXECUTIVE COMMITTEE REPORT TO SENATE

Jack noted that there was no action to be taken on the report at members' places, but that the vacancies on the copy are expected to be filled in by Senate's meeting on the 15th.

4. DRAFT 15 APRIL 2019 SENATE AGENDA

The chair spoke to the proposed agenda and the committee heard a motion to approve it. Casello and Seasons. Carried unanimously.

5. OTHER BUSINESS

There was no other business.

2 April 2019

Karen Jack
University Secretary

University of Waterloo
SENATE EXECUTIVE COMMITTEE
6 May 2019

A number of changes are proposed to Senate bylaws 1, 2, and 4 in light of restructuring and title changes in the Office of Research, and the office of the Associate Vice-President, Graduate Studies and Postdoctoral Affairs. They are:

- the title “Vice-President, University Research” has been changed to “Vice-President, Research and International”;
- replacement of other former titles with current titles and revisions to reflect current structures;
- a change for 12 members from elected positions to *ex officio* positions to reflect actual, long-standing practice for these members to be the associate deans (graduate studies, and research) from the Faculties.

In addition, a correction has been made in bylaw 2, Section 4.02 to properly refer to the body as a council and the word “government” has been changed to “governance” in bylaw 2, Sections 4.03 and 5.03.

Thus, it is proposed that Senate Bylaws 1, 2, and 4 be revised as provided below. In accordance with Section 14.01* of Bylaw 1: A bylaw relating generally to the business and affairs of Senate of the University of Waterloo, and its committees and councils, the bylaw changes are recommended to Senate for first reading at the 21 May 2019 meeting.

For Approval

Motion: To recommend that Senate receive the proposed bylaw changes for first reading at its 21 May 2019 meeting.

**The passage of a new bylaw or amendment(s) to an existing bylaw is accomplished in two readings by Senate. At the first reading, such discussion as is deemed appropriate by Senate shall take place. At the second reading, further discussion may take place and the vote on the document shall be taken. The two readings shall take place at different, but not necessarily consecutive, meetings of Senate.*

Feridun Hamdullahpur
President

Senate Bylaw 1

A bylaw relating generally to the business and affairs of Senate of the University of Waterloo, and its Committees and Councils.

BE IT ENACTED as a bylaw of Senate of the University of Waterloo, as follows:

1. Interpretation

1.01	In all the bylaws of Senate,
	a. “academic year” means the twelve-month period dating from 1 May of one year to 30 April of the succeeding year.
	b. “Senate” means Senate of the University of Waterloo.
	c. “Executive Committee” means the Executive Committee of Senate as established in the Senate bylaws.
1.02	Throughout all the bylaws of Senate of the University of Waterloo:
	a. Where the title “president” appears, an acting president or president pro tem, so designated by the Board of Governors, shall serve in the place of the president, with the latter’s full rights and responsibilities.
	b. Where the title “vice-president, academic & provost” appears, an acting vice-president, academic & provost or vice-president, academic & provost pro tem, so designated by the president and/or the Board of Governors, shall serve in the place of the vice-president, academic & provost, with the latter’s full rights and responsibilities.
	c. Where the title “vice-president, administration & finance” appears, an acting vice-president, administration & finance or vice-president, administration & finance pro tem, so designated by the president, shall serve in the place of the vice-president, administration & finance, with the latter’s full rights and responsibilities.
	d. Where the title “vice-president, advancement” appears, an acting vice-president, advancement or vice-president, advancement pro tem, so designated by the president, shall serve in the place of the vice-president, advancement, with the latter’s full rights and responsibilities.
	e. Where the title “vice-president, university relations” appears, an acting vice-president, university relations or vice-president, university relations pro tem, so designated by the president, shall serve in the place of the vice-president, university relations, with the latter’s full rights and responsibilities.
	f. Where the title “vice-president, university research research and international” appears, an acting vice-president, university research research and international or vice-president, university research research and international pro tem, so designated by the president and/or the Board of Governors, shall serve in the place of the vice-president, university research research and international, with the latter’s full rights and responsibilities.
	g. Where the title “associate vice-president, academic” appears, an acting associate vice-president, academic or associate vice-president, academic pro tem, so named to serve by the president, shall serve in the place of the associate vice-president, academic, with the latter’s full rights and responsibilities.
	h. Where the title “associate vice-president, graduate studies and postdoctoral affairs appears, an acting associate vice-president, graduate studies and postdoctoral affairs or associate vice-president, graduate studies and postdoctoral affairs pro tem, so named to serve by the president, shall serve in the place of the associate vice-president, graduate studies and postdoctoral affairs, with the latter’s full rights and responsibilities.

i.	Where the title “deputy provost, integrated planning and budgeting” appears, an acting deputy provost, integrated planning and budgeting or deputy provost, integrated planning and budgeting pro tem, so designated by the president, shall serve in the place of the deputy provost, integrated planning and budgeting, with the latter’s full rights and responsibilities.
j.	Where the titles “dean of each faculty” appear, an acting dean, or dean pro tem, so named to serve by the vice-president, academic & provost, shall serve in the place of the dean, with the latter’s full rights and responsibilities.

2. Schedule of meetings

2.01	The schedule of meetings for Senate and its committees and councils shall be approved by the chair of Senate and published by the Secretariat prior to the new academic year.
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3. Meetings of Senate

3.01	General meetings Senate shall normally hold ten (10) general meetings during each academic year. Notice of each meeting shall be communicated to the university community in such places and ways as may be designated from time to time by Senate.
3.02	Place of meetings Meetings of Senate shall be held upon the campus of the university.
3.03	Notice of an agenda and background material for general meetings Notice in writing of each general meeting and the agenda and available background material for any such meeting, shall be available to all members of Senate at least seven (7) days prior to the date of each such meeting.
3.04	Special meetings Special meetings of Senate shall be called by one of the following: The chair of Senate, upon the receipt of a request of the Executive Committee for such meeting; or The secretary of Senate, upon receipt by the secretary of a written request for such meeting signed by at least twenty (20) members of Senate, with such request to state the reason for calling the special meeting. Special meetings shall be called promptly. Notice in writing of each special meeting, together with the agenda and available background material shall be available to each member of Senate at least seven (7) days prior to the date of the meeting, provided that the chair of Senate shall have the power and authority to abridge such seven-day period when, in the chair’s absolute discretion, the urgency of any item of business to be dealt with at such meeting so requires. Notice in writing of each special meeting shall be communicated to the university community in such places and ways as may be designated from time to time by Senate.

4. Committees and councils - agenda and background material to be available

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| 4.01 | Notice in writing of each general meeting of any committee or council shall be available at least seven (7) days prior to the date of each such meeting. |
| 4.02 | The agenda and available background material for any general meeting of any committee or council shall be available at least seven (7) days prior to the date of each such meeting. |

5. Quorum

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| 5.01 | At all meetings of Senate and of its committees and councils, a majority of the members shall constitute a quorum for the transaction of the business and affairs of the body. |
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6. Meetings in open session

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| 6.01 | Subject to section 7 of this bylaw, all general and special meetings of Senate and its committees and councils shall be open to members of the university community, the public-at-large, and representatives of the news media. Senate will make every effort to hold its meetings in a room sufficiently large to accommodate those who indicate to the secretary of Senate, two full working days in advance of the meeting, their desire to attend. |
| 6.02 | Non-members in attendance at meetings shall not disrupt the proceedings of the meeting nor cause any disturbance by unreasonable noise or vocal expression. The chair may remove any such person when, in the chair's sole judgment, such person is engaging in improper or disruptive conduct that is detrimental to Senate carrying out its business. |

7. Meetings in closed session

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| 7.01 | <p>Notwithstanding the provisions of section 6 of this bylaw, and provided that all meetings shall begin in open session, Senate and its committees and councils shall have the right to hold any meeting or part thereof in closed session. This provision may exclude therefrom all persons, save for members and such resource persons as may be agreed should be in attendance, for the purpose of considering confidential financial matters of the university or where intimate financial or personal matters of any person may be disclosed, unless such person requests that such part of the meeting be open to the public.</p> <p>The Executive Committee shall determine for purposes of the Senate agenda whether any matter is of a confidential nature and such matter shall be so designated on the agenda for such Senate meeting and shall be designated and described in a manner consistent with maintaining the confidentiality of such matter.</p> <p>The chair or chair(s) of any committee or council of Senate will determine whether any matter is of a confidential nature and such matter shall be so designated on the agenda for such meeting and shall be designated and described in a manner consistent with maintaining the confidentiality of such matter.</p> <p>Senate or its committees or councils shall initially deal with any such confidential matter in closed session, but, after receiving the pertinent information relative to the confidential matter, may direct that the matter be thereupon considered in open session.</p> |
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8. Declarations of conflict of interest

8.01	At the beginning of each meeting of Senate or any of Senate's committees or councils, the chair will call for members to declare any conflicts of interest with regard to any agenda item. For agenda items to be discussed in closed session, the chair will call for declarations of conflict of interest at the beginning of the closed portion of the meeting. Members may nonetheless declare conflicts at any time during a meeting.
8.02	A member shall be considered to have an actual, perceived or potential conflict of interest, when the opportunity exists for the member to use confidential information gained as a member of Senate, or any of Senate's committees or councils, for the personal profit or advantage of any person, or use the authority, knowledge or influence of the Senate, or a committee or council thereof, to further her/his personal, familial or corporate interests or the interests of an employee of the university with whom the member has a marital, familial or sexual relationship.
8.03	Members who declare conflicts of interest shall not enter into debate nor vote upon the specified item upon which they have declared a conflict of interest. The chair will determine whether it is appropriate for said member to remove themselves from the meeting for the duration of debate on the specified item(s).
8.04	Where Senate or a committee or council of Senate is of the opinion that a conflict of interest exists that has not been declared, the body may declare by a resolution carried by two-thirds of its members present at the meeting that a conflict of interest exists and a member thus found to be in conflict shall not enter into debate on the specified item upon which they have declared a conflict of interest. The chair will determine whether it is appropriate for said member to remove themselves from the meeting for the duration of debate on the specified item(s).

9. Representations to meetings

9.01	Any members of the university community, or of the public-at-large, wishing to make representations to any meeting of a committee or council shall file with the secretary of the relevant committee or council, at least two full working days prior to the date of such proposed meeting, written notice to that effect with such notice to designate the nature of the proposed representations.
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10. Time limit on representations

10.01	The chair of any committee or council may limit the time to be allotted to members of the university community and the public-at-large for committee or council representations.
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11. Secretary

11.01	The university secretary shall be the non-voting secretary of Senate.
11.02	The university secretary shall appoint one or more associate secretaries of Senate to act as secretary of Senate in the absence of the university secretary.
11.03	The university secretary, or designate, shall be the non-voting secretary of each committee or council of Senate.

12. Limit on service on committees

12.01	An elected member of Senate shall not serve on more than one of the Executive, Finance or Long Range Planning Committees.
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13. Term of office

13.01 Except where specified by Senate bylaws, the term of office on committees or councils shall be one year, with members eligible for re-election.

14. Bylaws - general

14.01 The passage of a new bylaw or amendment(s) to an existing bylaw is accomplished in two readings by Senate. At the first reading, such discussion as is deemed appropriate by Senate shall take place. At the second reading, further discussion may take place and the vote on the document shall be taken. The two readings shall take place at different, but not necessarily consecutive, meetings of Senate.

14.02 No proposed bylaw or amendment(s) will be given reading unless it has been bound into or accompanies the agenda portfolio distributed in advance of the meeting.

14.03 Any proposed bylaw or amendment(s) shall include the proposed wording of the bylaw or amendment(s), and where appropriate, a summary of the reasons for such bylaw or amendment(s).

14.04 In order to be approved by Senate, any new bylaw or amendment(s) to bylaws must receive the affirmative vote of at least two-thirds of the members of Senate present and voting at the meeting.

15. Faculty constitutions

15.01 Each faculty and each academic department and school of the university may adopt a formal constitution governing its operations, provided that each such constitution and any amendments thereto shall be inoperative and ineffective until approved by Senate. No provision of the constitutions shall be inconsistent with any provisions of *The University of Waterloo Act, 1972*, as amended, and no provision of any constitution shall be exempt from the provisions of any of the bylaws or established policies of the university which are within the final jurisdiction of Senate, except as expressly approved by Senate.

Amended/consolidated from Bylaws 1, 6, 7, and 10 in two readings in September and October 2014.

Senate Bylaw 2

A bylaw to establish Committees and Councils of Senate of the University of Waterloo.

BE IT ENACTED as a bylaw of Senate of the University of Waterloo, as follows:

1. Executive Committee

1.01	There shall be a standing committee of Senate called the Executive Committee.
1.02	<p>Executive Committee Membership</p> <p>The membership of this committee shall consist of the following:</p> <p><i>Ex Officio</i></p> <p>The president of the university, who shall chair this committee. The vice-president, academic & provost. The associate vice-president, graduate studies and postdoctoral affairs The president of the Faculty Association of the University of Waterloo.</p> <p>Elected</p> <p>One faculty member of Senate from each faculty of the university. Three members from the student members of Senate, at least one of whom shall be an undergraduate student and at least one of whom shall be a graduate student. One member of Senate from among the community-at-large members of the Board of Governors. One faculty member of Senate from the affiliated and federated institutions of Waterloo. One member from among the alumni members of Senate.</p>
1.03	The term of office of members elected pursuant to paragraph 1.02.b shall be one year. Each member is eligible for re-election.
1.04	<p>Powers and duties of Executive Committee</p> <p>The Executive Committee shall have the following powers and duties:</p> <p>To request special meetings of Senate, in accordance with Senate Bylaw 1. On those occasions when the agenda does not, in the estimation of the Executive Committee, warrant a meeting of Senate, to cancel any such meeting of Senate, and to exercise the powers of Senate, within the limits of <i>The University of Waterloo Act, 1972</i>, on all matters considered by the Executive Committee in its discretion to be of sufficient urgency that they must be decided prior to the next regular meeting of Senate, provided that the Executive Committee shall have no power under any circumstances to repeal, amend or modify Senate bylaws, or to exercise Senate's responsibilities under Policies 45, 48, 50 and 68. All such actions are to be reported to Senate. To prepare the agenda for all regular and special meetings of Senate. To receive and review reports from the deans of the university prior to their submission to Senate at each regular meeting. To present to Senate, normally at the last regular meeting in the academic year in April, a list of nominations for the committees and councils of Senate.</p>

	<p>To make recommendations to Senate as may be necessary from time to time regarding the establishment of ad hoc committees of Senate, such recommendations to include the terms of reference of any such committee and a list of nominations for the membership thereof.</p> <p>To receive and review the reports and recommendations of all committees and councils, prior to their presentation to Senate and to make at its discretion recommendations to Senate thereon.</p> <p>To act on behalf of Senate on such matters as Senate may from time to time designate.</p> <p>To report to Senate, as expeditiously as possible, with respect to the conduct of such matters as shall be delegated by Senate to the committee from time to time.</p>
1.05	<p>Meetings of the Executive Committee</p> <p>The committee shall normally hold ten (10) regular meetings during each academic year, each such meeting to be held approximately two weeks prior to the date of each general meeting of Senate. Special meetings of the committee shall be called by the chair of the committee.</p>

2. Finance Committee

2.01	<p>There shall be a standing committee of Senate called the Finance Committee.</p>
2.02	<p>Finance Committee Membership</p> <p>The membership of this committee shall consist of the following:</p> <p><i>Ex Officio</i></p> <p>The president of the university, who shall chair this committee. The vice-president, academic & provost. The vice-president, administration & finance. The vice-president, university research research and international. The associate vice-president, graduate studies and postdoctoral affairs The deputy provost, integrated planning and budgeting The dean of each faculty.</p> <p>Elected</p> <p>One member from the community-at-large members of the Board of Governors. One elected faculty member of Senate from each faculty and one faculty member of Senate from the affiliated and federated institutions of Waterloo. Three members from the elected student members of Senate, at least one of whom shall be an undergraduate student and at least one of whom shall be a graduate student. One member from among the alumni members of Senate.</p>
2.03	<p>The term of office of members elected pursuant to paragraph 2.02.b shall be one year. Each member is eligible for re-election.</p>
2.04	<p>Powers and Duties of Finance Committee</p> <p>The Finance Committee shall have the following powers and duties:</p> <p>To consider, study, and review all matters pertaining to the financial operations of the university and to make recommendations to Senate thereon. To consider, study, and review the general policies governing the internal allocation of the university's financial resources and to make recommendations to Senate thereon.</p>

To receive each year from the vice-president, academic & provost, for consideration, study, and review, on behalf of Senate, a detailed operating budget for the university and to make recommendations to Senate thereon.

3. Long Range Planning Committee

3.01 There shall be a standing committee of Senate called the Long Range Planning Committee.

3.02 Long Range Planning Committee Membership

The membership of this committee shall consist of the following:

Ex Officio

The president of the university.

The vice-president, academic & provost, who shall chair this committee.

The vice-president, administration & finance.

The vice-president, ~~university research~~ **research and international**.

The associate vice-president, graduate studies and postdoctoral affairs

The deputy provost, integrated planning and budgeting

The dean of each faculty.

Elected

One elected faculty member of Senate from each faculty and one faculty member of Senate from the affiliated and federated institutions of Waterloo.

One member from the Board of Directors of the Faculty Association of the University of Waterloo.

Three members of Senate from the elected student members, at least one of whom shall be an undergraduate student and at least one of whom shall be a graduate student.

One member of Senate from the community-at-large members of the Board of Governors.

One member from among the alumni members of Senate.

3.03 The term of office of members elected pursuant to paragraph 3.02.b shall be one year. Each member is eligible for re-election.

3.04 Powers and duties of Long Range Planning Committee

The Long Range Planning Committee shall have the following powers and duties:

To make recommendations to Senate in all matters pertaining to the co-ordination of the planning of the academic, physical, and operational development of the university and the achievement of a planned rate and scope of such development.

To receive from the president, for consideration, study and review, on behalf of Senate, plans for the development of the university and to make recommendations to Senate thereon.

To undertake such studies as Senate may designate from time to time.

To report to Senate, as expeditiously as possible, with respect to the conduct of such matters as shall be delegated by Senate to the committee from time to time.

4. Graduate & Research Council

4.01	There shall be a council of the university, appointed by and responsible to Senate, called the Graduate & Research Council.
4.02	<p>Graduate & Research Council Membership</p> <p>The membership of this council shall consist of the following:</p> <p><i>Ex Officio</i></p> <p>The president of the university. The vice-president, academic & provost. The vice-president, university research<u>research and international</u>, who shall co-chair this council. The associate vice-president, graduate studies and postdoctoral affairs, who shall co-chair this committee<u>council</u>. The associate dean of graduate studies in the graduate studies and postdoctoral affairs office<u>An assistant vice-president, graduate studies and postdoctoral affairs appointed on the recommendation of the associate vice-president, graduate studies and postdoctoral affairs.</u> The associate vice-president, university interdisciplinary research. The associate vice-president, external-research <u>oversight and analysis</u>. <u>The associate dean for graduate studies from each Faculty.</u> <u>The associate dean for research from each Faculty.</u> The chief ethics officer<u>director of research ethics</u>. The director, research partnerships. The director, graduate academic services. The university librarian, or designate. The president of the Graduate Student Association.</p> <p>Elected / Appointed</p> <p>Two faculty members with Approved Doctoral Dissertation Supervisor status from each faculty, one of whom must be an associate dean with a research and/or graduate studies portfolio. Associate deans serve without term limits; others serve for a two year term.</p> <p>One faculty member from the affiliated and federated institutions of Waterloo, who shall serve for a term of two years. One graduate student from each faculty, each of whom shall serve for a term of two years.</p>
4.03	<p>Powers and Duties of the Graduate & Research Council</p> <p>The Graduate & Research Council shall consider all questions relating to the academic quality of graduate studies and research activity within the university and, without intending to restrict the generality of the foregoing, the Graduate & Research Council shall,</p> <p>Make recommendations to Senate with respect to the government<u>governance</u>, direction and management of, or any changes in rules, regulations or policies for graduate studies and research in the university. Advise the vice-president, academic & provost on all matters relating to graduate studies and research. Receive, consider, study and review briefs on any aspect of graduate studies and research from members of the university.</p>

Make recommendations to Senate with respect to any financial matter pertaining to graduate studies and research.

Consider, study and review all proposals for new graduate programs, the deletion of graduate programs, major changes to existing graduate programs, arrange for internal appraisals as the council shall see fit, and make recommendations to Senate thereon.

On behalf of Senate, consider and approve all new graduate courses, the deletion of graduate courses, and proposed minor changes to existing graduate courses and programs, and provide Senate with a brief summary of council's deliberations in this regard. Any matter of controversy that might arise may be referred to Senate.

Consider, study and review all proposals for new centres and institutes, and the closure of centres and institutes, and make recommendations to Senate thereon.

On behalf of Senate, consider and approve renewals for centres and institutes, and report such renewals to Senate for information. Any matter of controversy that might arise may be referred to Senate.

On behalf of Senate, consider and approve all new graduate scholarships and awards. Any matter of controversy that might arise may be referred to Senate.

5. Undergraduate Council

5.01 There shall be a council of the university, appointed by and responsible to Senate, called the Undergraduate Council.

5.02 Undergraduate Council Membership

The membership of this council shall consist of the following:

Ex Officio

The president of the university.

The vice-president, academic & provost.

The associate vice-president, academic, who shall co-chair this council.

The dean of the federated university.

The associate dean for undergraduate studies for each faculty.

The registrar of the university.

The university librarian, or delegate.

The vice-president (education) or equivalent from the Undergraduate Student Association of each faculty of the university.

Elected / Appointed

One member of the faculty from each faculty of the university which offers undergraduate programs, each of whom shall serve for a term of two years.

One member of faculty from the federated university, who shall serve for a term of two years.

One member of faculty from the affiliated university colleges, who shall serve for a term of two years.

A director appointed from Co-operative Education & Career Action.

An executive member appointed from the Federation of Students.

5.03 **Powers and Duties of the Undergraduate Council**

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

Make recommendations to Senate with respect to rules and regulations for the ~~government~~governance, direction and management of undergraduate studies in the university.

Make recommendations to Senate with respect to new undergraduate programs/plans, the deletion of undergraduate programs/plans, and major changes to undergraduate programs/plans.

On behalf of Senate, consider and approve all new undergraduate courses, the deletion of undergraduate courses, and proposed changes to existing undergraduate courses and minor changes to programs and/or plans, and provide Senate with a summary of council's deliberations in this regard. Any matter of controversy that might arise may be referred to Senate.

Advise the vice-president, academic & provost on all matters relating to undergraduate studies.

Consider, study and review briefs on any aspect of undergraduate studies from members of the university.

Amended/consolidated from Bylaws 2, 3, 4, 8 and 9 in two readings, September and October 2014.

Senate Bylaw 4

A bylaw relating to the naming of additional *ex officio* members of Senate of the University of Waterloo.

BE IT ENACTED as a bylaw of Senate of the University of Waterloo, as follows:

1. *Ex officio* members

WHEREAS *The University of Waterloo Act, 1972* provides in section 18.a.9 that Senate of the university may add to its membership such other *ex officio* members as Senate by bylaw may, from time to time, designate; and

WHEREAS *The University of Waterloo Act, 1972* provides in section 18.b.2 that elected members of the faculty shall equal in number one more than the total number of all other members of Senate; and

WHEREAS *The University of Waterloo Act, 1972* provides in section 18.c. that upon the designation of and addition, from time to time, by Senate of any additional *ex officio* members, the number of elected members from the Board of Governors, the undergraduate students, the graduate students and the alumni shall be increased by whatever numbers are necessary to retain the ratios, in each case, of the number of such elected persons to the number of elected faculty.

BE IT THEREFORE enacted as a bylaw of Senate of the University of Waterloo as follows:

That the following be named as *ex officio* members of Senate:

- a. The vice-president, advancement.
- b. The vice-president, university relations.
- c. The vice-president, ~~university research~~research and international.
- d. The associate vice-president, academic.
- e. The deputy provost, integrated planning and budgeting.
- f. The president of the Faculty Association of the University of Waterloo.
- g. The president of the Federation of Students, University of Waterloo.
- h. The president of the Graduate Student Association - University of Waterloo.

That the chief returning officer be empowered upon passage of this bylaw to take whatever steps are necessary to carry out such elections or by-elections as may be necessary to comply with the provisions of *The University of Waterloo Act, 1972*, cited above and arising from the designation of *ex officio* members of Senate by the passage or amendment of this bylaw.

Approved by Senate 20 May 1975.

Amended by Senate in two readings, December 1980 and January 1981.

Amended by Senate in two readings, December 1983 and January 1984.

Amended by Senate in two readings, May and June 1987.

Amended by Senate in two readings, May and June 1990.

Amended by Senate in two readings, October and November 2012.

Amended by Senate in two readings, November 2013 and January 2014.

Amended from Bylaw 11 by Senate in two readings, September and October 2014.

Amended by Senate in two readings, March and May 2015.

University of Waterloo
SENATE EXECUTIVE COMMITTEE
Report of the Vice-President, Academic & Provost
6 May 2019

FOR APPROVAL

Roster of Graduands

Since the roster of graduands will not be available until after the regular meeting of Senate in May and approval is required before the June meeting, the following motion is proposed:

Motion: That the Senate Executive Committee recommend that Senate delegate such approval to its Executive Committee for its 3 June 2019 meeting.

James Rush
Vice-President, Academic & Provost

**University of Waterloo
SENATE
Notice of Meeting**

DRAFT

Date: Tuesday 21 May 2019
Time: 3:30 p.m.
Place: Needles Hall, room 3407

	OPEN SESSION	Action
3:30	<p><u>Consent Agenda</u> Motion: To approve or receive for information by consent items 1-5 below.</p> <ol style="list-style-type: none"> 1. Minutes of the 15 April 2019 Meeting 2. Reports from Committees and Councils <ol style="list-style-type: none"> a. Graduate & Research Council b. Undergraduate Council 3. Report of the President <ol style="list-style-type: none"> a. Recognition and Commendation 4. Reports from the Faculties 5. Committees & Appointments 	<p>Decision</p> <p>Decision/Information Decision/Information</p> <p>Information</p> <p>Information</p> <p>Decision</p>
3:35	<p><u>Regular Agenda</u> 6. Business Arising from the Minutes</p>	Information
3:40	7. Research Presentation – TBD	Information
3:55	8. Reports from Committees and Councils	
4:00	<ol style="list-style-type: none"> a. Executive Committee b. Graduate & Research Council c. Undergraduate Council 	Decision Decision Decision
4:05		
4:10	9. Report of the President	Information
4:25	10. Q&A Period with the President	Information
	11. Report of the Vice-President, Academic & Provost	
4:35	<ol style="list-style-type: none"> a. Roster of Graduands 	Decision
4:40	12. Report of the Vice-President, University Research & International	Information
4:45	13. Other Business	
	CONFIDENTIAL SESSION	Action
4:50	14. Minutes of the 15 April 2019 Meeting	Decision
4:55	15. Business Arising from the Minutes	
5:00	16. Other Business	

*to be distributed

29 April 2019

KJJ/ejg

Karen Jack
University Secretary
Secretary to Senate

University of Waterloo
SENATE
Minutes of the Monday 15 April 2019 Meeting

Present: Bilal Akhtar, Michael Balogh, Sandra Banks, Katherine Bergman, Anne Bordeleau, Carmen Bruni, Claudio Canizares, Jeff Casello, Fred Chereski, David Clausi, Mario Coniglio, Simon Courtenay, Joan Coutu, Eric Croiset, Shannon Dea, Peter Deadman, Charmaine Dean, Mathieu Doucet, Tia Driver, David Edwards, Paul Fieguth, Wendy Fletcher, George Freeman, Matthew Gerrits, Mark Giesbrecht, Julia Goyal, Kelly Grindrod, John Haddock, Feridun Hamdullahpur (chair), Craig Hardiman, Dennis Huber, Marios Ioannidis, Karen Jack (secretary), Spiro Karigiannis, Martin Karsten, Alysia Kolentzis, Kesen Ma, Mungo Marsden, Teferi Mergo, Ian Milligan, Katie Misener, Grant Mitchell, Barb Moffatt, Rick Myers, Cathy Newell Kelly, Daniel O'Connor, William Pristanski, Jim Rush, Beth Sandore Namachchivaya, Mark Seasons, Hannah Sesink, Marcus Shantz, Joanne Shoveller, James Skidmore, Richard Staines, Paul Stolee, Pearl Sullivan, Susan Tighe, Bryan Tolson, Ross Willard, Dan Wolczuk, Richard Wu

Guests: Bruce Campbell, Aldo Caputo, Amelia Clarke, Madison Cox, Donna Ellis, Erin Gillespie, Kevin Hare, Andrea Kelman, Derek Madge, Nick Manning, Norah McRae, Ian Rowlands, Robert Park, Diana Parry, Chris Read, Emily Schroeder, Karl Schuett, Daniela Seskar-Hencic, Jason Small, Allan Starr, Brandon Sweet, Shirley Tang, Jeff Wilson

Absent: Jean Andrey*, Dominica Barton, Chris Bauch*, Lisa Bauer-Leahy, Steven Bednarski*, Kankar Bhattacharya*, Brian Cepuran*, Tara Collington*, Fraser Easton*, Marlene Epp*, Cindy Forbes, Shikha Gandhi, Rob Gorbet*, Thorsten Heins, Craig Janes, Scott Kline*, Robert Lemieux*, Tyler Marques, Erin O'Connell*, Linda Ogechi Iheme, Doug Peers*, Neil Randall*, Max Salman*, Naima Samuel*, Hamid Tizhoosh*, Thomson Tran, Stephen Watt*, Maya Venters*, En-Hui Yang

*regrets

**telephone

OPEN SESSION

CHAIR'S REMARKS

The president thanked departing members for their service: Craig Janes, James Skidmore, Simon Courtenay, David Edwards, Marios Ioannidis, Spiro Karigiannis, Mungo Marsden, Daniel O'Connor, Ross Willard, Daniel Wolczuk, Marlene Epp, Alysia Kolentzis, Tia Driver, Richard Wu, Thomson Tran, Grant Mitchell, Bilal Akhtar, Tyler Marques, Matthew Gerrits, Hannah Sesink, Brian Cepuran and Thorsten Heins. A round of applause followed.

Consent Agenda

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

Dea and O'Connor.

1. MINUTES OF THE 25 MARCH 2019 MEETING

Senate approved the minutes of the meeting.

2. REPORTS FROM COMMITTEES AND COUNCILS

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

Undergraduate Council. Senate heard the following motions:

Faculty of Applied Health Sciences

Department of Kinesiology – Admission Requirements

Senate heard a motion that the admission requirements for the Bachelor of Science, Kinesiology, be revised as follows, effective 1 September 2020.

School of Public Health and Health Systems – Admission Requirements

Senate heard a motion that the admission requirements for the Bachelor of Science, Honours Health Studies, be revised as follows, effective 1 September 2020.

Senate heard a motion that the admission requirements for the Honours Bachelor of Public Health, be revised as follows, effective 1 September 2020.

Faculty of Arts

Academic Standing Definition

Senate heard a motion that the academic standing definition for the Faculty of Arts be revised as follows, effective 1 September 2020.

Non-Degree Students

Senate heard a motion that the academic standing regulations for non-degree students be revised as follows, effective 1 September 2020.

Faculty of Environment

Examinations and Standings – Residency Rule

Senate heard a motion that the residency rule outlined below be removed from the calendar, effective 1 September 2018.

Registrar’s Office

Senate heard a motion that it endorse the Senate Undergraduate Council curricular submission guidelines as presented, effective 1 April 2019.

Senate received the remainder of the report for information.

3. REPORT OF THE PRESIDENT

Recognition and Commendation. Senate received the report for information.

4. REPORT OF THE COUNCIL OF ONTARIO UNIVERSITIES ACADEMIC COLLEAGUE

Senate received the report for information.

5. REPORTS FROM THE FACULTIES

Senate received the reports for information.

The question was called and the motion carried unanimously.

Regular Agenda

6. BUSINESS ARISING FROM THE MINUTES

Members heard that Casello will speak to graduate recruitment activities during the Vice-President, Academic & Provost’s report.

7. PRESENTATIONS

Bryan Tolson, president, Faculty Association of the University of Waterloo

Tolson walked senators through his presentation, highlighting: the faculty grievance and appeal process; the separation of the AF&T committee from the FAUW Board; the general process for managing issues; supports available for members; current areas of focus for FAUW; data re: Waterloo’s sessional instructors. In discussion, agreement that continuing to monitor use of sessional instructors is worthwhile.

Beth Sandore Namachchivaya, University Librarian

Namachchivaya provided senators with an overview of the library's role, its activities, and goals. Members heard: data re: resources and use; the library's role in advancing research and inquiry; costs and resource concerns; the library's role in building graduate student skills; emerging initiatives; support services; spaces and use, including revitalization and innovation efforts. In discussion: Waterloo's good position with online support in the U15; the role of ambassadors in obtaining feedback; future aspirations, and the way the library is participating in the development of the University's next strategic plan.

8. REPORTS FROM COMMITTEES AND COUNCILS

Executive Committee. Senate heard that the deans, the chair of the heads of the affiliated and federated institutions of Waterloo, and the presidents of the Federation of Students and Graduate Student Association have recommended names of nominees as provided on the list of nominees. Senate heard a motion to acclaim the membership of Senate committees and councils and the Board of Governors as provided on the list of nominees.

Gerrits and Tolson. Carried unanimously.

Graduate & Research Council. Senate heard the following motion:

Program Change

Faculty of Engineering

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

Dean and Sullivan. Carried unanimously.

Undergraduate Council

Faculty of Applied Health Sciences

Recreation and Leisure Studies

Senate heard a motion to approve the proposed Event Management Minor as described, effective 1 September 2020.

Coniglio and Stolee. Carried unanimously.

Senate heard that the motion relating to the Faculty of Engineering's special topics has been withdrawn since they already were approved appropriately by Undergraduate Council on behalf of Senate.

Faculty of Mathematics

Actuarial Science

Senate heard a motion to approve the proposed changes to the structure of the Actuarial Science Option plans to a Plan 10 (Actuarial Science) and Plan 20 (Specialization), effective 1 September 2020.

Coniglio and Hare. Carried unanimously.

9. REPORT OF THE PRESIDENT AND Q&A PERIOD

The president provided an overview of recent activities, including: Waterloo Professor Avery

Broderick's involvement in the recent publication of the first image of a black hole; a strategic plan update; commentary on the recent provincial budget; activities of the committee on student mental health. During his presentation, he spoke to the sad occasion of the death of one of the University's students recently and offered thoughts on future training efforts to increase awareness of mental health matters. In discussion: future work of the advisory committee on student mental health; the University's role in the broader conversation in the community re: mental health matters.

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

The provost introduced Newell Kelly and Casello and invited them to speak to admissions updates in their respective areas. Newell Kelly advised: undergraduate applications are on track, but have slightly declined in engineering, something that she noted is being seen across the sector; challenges exist in some areas; there is an expectation that Waterloo will admit to the 80% average threshold. Casello spoke to: his office's marketing, recruitment and enrollment management strategies; specific efforts re: recruitment; applicant pools and targets, and applications at the graduate level; positive developments on domestic targets. In discussion: associate deans have data re: research/professional studies; coming changes to the application system for domestic students.

11. REPORT OF THE VICE-PRESIDENT, UNIVERSITY RESEARCH

Following a brief review of aspects of the report, Senate received it for information. Senate also heard that an announcement from Minister Duncan regarding a Canada Excellence Research Chair at Waterloo is forthcoming this week.

12. OTHER BUSINESS

There was no other business.

Senate convened in confidential session.

16 April 2019

Karen Jack
University Secretary

CONFIDENTIAL SESSION

Confidential meeting minutes have been removed.

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

Senate Graduate & Research Council met on 8 April 2019 and agreed to forward the following items to Senate for approval or information as part of the consent agenda.

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

FOR APPROVAL

GRADUATE STUDIES ACADEMIC CALENDAR CHANGES

Motion: To approve the following Graduate Studies Academic Calendar changes, effective 1 May 2019, as attached.

- 1) Number of terms a student can be inactive for parental leave.
Rationale: Changing the number of terms a student can be inactive for parental leave to match the federal government legislation of 18 months (this falls between 4 to 5 terms). The Graduate Operations Committee agreed to allow 5 terms for parental leave.
- 2) Full-time student definition
Rationale: Expanding the full-time student definition to include information from the Ontario Council on Graduate Studies, 2017, “Principles for Graduate Study at Ontario’s Universities, Resolution 5 - The principle on timely completion”.

FOR INFORMATION

GRADUATE STUDIES ACADEMIC CALENDAR CHANGES

On behalf of Senate, council approved the following Graduate Studies Academic Calendar changes, effective 1 May 2019, as presented.

- 1) Student records ownership and access
- 2) Editorial updates

CURRICULAR SUBMISSIONS

On behalf of Senate, council approved new courses, course revisions, course inactivation, new milestones, and minor program revisions (e.g., updated the PhD comprehensive examination descriptions and requirements) for the Faculties of Arts (accounting, economics, English, French, German, global governance, political science, psychology, religious studies, sociology), Engineering (civil and environmental engineering, conrad school of entrepreneurship and business, electrical and computer engineering, management science, mechanical and mechatronics engineering, systems design engineering), Environment (geography and environmental management, environment enterprise and development, environment resource and sustainability, planning), Mathematics (computer science, pure mathematics, applied mathematics, statistics and actuarial science), and Science (biology, chemistry, earth and environmental science, vision science, pharmacy, physics).

RENEWAL OF CENTRES AND INSTITUTES

On behalf of Senate, council approved the renewal, for a 5-year term, of the Waterloo Institute for Nanotechnology, as presented.

On behalf of Senate, council approved the renewal, for a 5-year term, of the South Western Ontario Research Data Centre, as presented.

GRADUATE AWARDS

On behalf of Senate, council approved the Howard Armitage Graduate Community Leadership Award (endowment), Soprema Award: Tomorrow's Leaders (trust), Mathematics Doctoral Prize (trust), and Cybersecurity and Privacy Excellence Graduate Scholarship (operating).

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

Charmaine Dean
Vice President, Research & International

1) Number of terms a student can be inactive for parental leave

Description and rationale for proposed changes:

Changing the number of terms a student can be inactive for parental leave to match the federal government legislation of 18 months (this falls between 4 to 5 terms). The Graduate Operations Committee agreed to allow 5 terms for parental leave.

Proposed effective date: Term: Spring Year: 2019

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

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

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Parental leave</p> <p>Students who become parents through birth or adoption may take up to <u>3</u> terms of uninterrupted leave during the first year of birth or adoption. If both parents are University of Waterloo students, the leave can be split between the two. Both University of Waterloo parents cannot be on parental leave at the same time; however, one partner can be on parental leave while the other partner is on birth leave. Parental leaves must coincide with the start and end dates of academic terms.</p> <p>Students planning on going on parental leave must request a change of their enrolment status to Inactive by completing the Change of enrolment status form.</p> <p>Students on parental leave are not expected to study or conduct research while on leave, and thus should not expect access to their supervisor. Students on parental leave will have limited access to the services of the University,</p>	<p>Parental leave</p> <p>Students who become parents through birth or adoption may take up to <u>5</u> terms of uninterrupted leave during the first year of birth or adoption. If both parents are University of Waterloo students, the leave can be split between the two. Both University of Waterloo parents cannot be on parental leave at the same time; however, one partner can be on parental leave while the other partner is on birth leave. Parental leaves must coincide with the start and end dates of academic terms.</p> <p>Students planning on going on parental leave must request a change of their enrolment status to Inactive by completing the Change of enrolment status form.</p> <p>Students on parental leave are not expected to study or conduct research while on leave, and thus should not expect access to their supervisor.</p>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>More information about access to services is available on the Graduate Studies and Postdoctoral Affairs (GSPA) website.</p> <p>Students who wish to apply for a University of Waterloo parental leave bursary should complete the Graduate Studies Parental Leave Bursary application.</p>	<p>Students who wish to apply for a University of Waterloo parental leave bursary should complete the Graduate Studies Parental Leave Bursary application.</p>

Graduate Operations Committee approval date (mm/dd/yy): 09/18/2018

2) Full-time student definition

Description and rationale for proposed changes:

Expanding the full-time student definition to include information from the Ontario Council on Graduate Studies, 2017, “Principles for Graduate Study at Ontario’s Universities, Resolution 5 - The principle on timely completion”.

Proposed effective date: Term: Spring Year: 2019

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/full-time-students>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Regular full-time graduate students</p> <p>Students who have been accepted by the University to study for a higher degree on a full-time basis must:</p> <ol style="list-style-type: none"> 1. Be engaged in studies requiring an Honours undergraduate degree or its equivalent as a prerequisite for admission. 2. Be making substantial demands upon the resources of the University. 3. Be pursuing his or her studies as a full-time occupation. 4. Identify himself or herself as a full-time graduate student. 	<p>Regular full-time graduate students</p> <p>Students who have been accepted by the University to study <u>on a full-time basis</u> for a higher degree must <u>meet the following criteria</u>:</p> <ol style="list-style-type: none"> 1. Be engaged in studies requiring an Honours undergraduate degree or its equivalent as a prerequisite for admission. 2. Be making substantial demands upon the resources of the University. 3. Be pursuing his or her studies as a full-time occupation. 4. Identify himself or herself as a full-time graduate student.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ol style="list-style-type: none"> 5. Be designated by the University as a full-time student. 6. Be geographically available and visit the campus regularly. Without forfeiting full-time status, a graduate student, while still under supervision, may be absent from the University (e.g., visiting libraries, doing field work, attending a graduate course at another institution, etc.) provided that, if any such period of absence exceeds four weeks in any one term, written evidence shall be available in Graduate Studies and Postdoctoral Affairs (GSPA) to the effect that the absence (in the form of full-time off-campus registration status) has the approval of the Supervisor, Department Graduate Officer, and the Associate Vice-President, Graduate Studies and Postdoctoral Affairs. 7. Be considered to be a full-time graduate student by his or her supervisor. 8. Not be employed by the University for more than an average of ten hours per week for any term during which they are enrolled as full-time graduate students. If a student is employed as a teaching assistant or demonstrator, the ten hours per week should represent the total time spent by the student in connection with the appointment - including preparation, marking examinations, etc. 	<ol style="list-style-type: none"> 5. Be designated by the University as a full-time <u>graduate student*</u>. 6. Be geographically available and visit the campus regularly. Without forfeiting full-time status, a graduate student, while still under supervision, may be absent from the University (e.g., visiting libraries, doing field work, attending a graduate course at another institution, etc.) provided that, if any such period of absence exceeds four weeks in any one term, written evidence shall be available in Graduate Studies and Postdoctoral Affairs (GSPA) to the effect that the absence (in the form of full-time off-campus registration status) has the approval of the Supervisor, Department Graduate Officer, and the Associate Vice-President, Graduate Studies and Postdoctoral Affairs. 7. Be considered to be a full-time graduate student* by his or her supervisor. 8. Not be employed by the University for more than an average of ten hours per week for any term during which they are enrolled as full-time graduate students*. If a student is employed as a teaching assistant or demonstrator, the ten hours per week should represent the total time spent by the student in connection with the appointment - including preparation, marking examinations, etc. <p><u>*Full-time graduate students are expected to pursue their graduate degree on a full-time basis and make satisfactory progress toward timely completion of all program requirements. It is not possible, or desirable, for the University to monitor and enforce the employment activities of its graduate students outside the University. However, it is both possible and desirable for the University to ensure that it does not itself create a structural situation that jeopardizes the ability of the graduate student to make full-time progress towards the completion of graduate program requirements. Accordingly, Ontario Council on Graduate Studies (OCGS) is committed to the principle that full-time graduate students are employed no more than an average of 10 hours per week on campus.</u></p>

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

Senate Undergraduate Council met on 9 April 2019 and agreed to forward the following items to Senate. Council recommends that these items be included for information or approval, as noted, in the consent agenda.

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

FOR APPROVAL

ACADEMIC REGULATION CHANGES

Faculty of Arts

Breadth Requirements

- 1. Motion:** That the breadth requirements for the Bachelor of Arts, be revised as follows, effective 1 September 2020.

Background and Rationale:

The following changes to the breadth requirements are proposed (strikeout = deleted text; bold = new text):

Bachelor of Arts Breadth Requirements

All Bachelor of Arts (BA) students must meet the BA Breadth Requirements:

Requirement	Units	Subjects
Fine, Performing, and Communication Arts	0.5 unit	DAC, FINE, MUSIC, SPCOM, THPERF, VCULT
Humanities	1.0 unit	CLAS, ENGL, HIST, MEDVL, PHIL, RS
Languages and Cultures	1.0 unit	ASL, CHINA, CI, CROAT, DUTCH, EASIA, FR, GER, GRK, ITAL, ITALST, JAPAN, JS, KOREA, LAT, MOHAWK , PORT, REES, RUSS, SI, SPAN. See Note 4 below.
Social Sciences	2.0 units	ANTH, ECON, PSCI, PSYCH, SDS, SOC. See Note 2 below.
Transdisciplinary Studies	0.5 unit	AFM, APPLS, ARBUS, ARTS, CMW, CNDST, GBDA,

		GSJ, HRM, HRTS, HUMSC, INDG, INTST, IS, LS, MENN, MGMT, PACS, SMF, SOCWK. Also any course taken in another University of Waterloo faculty. See Notes 1 and 5 below.
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Rationale: MOHAWK is a new subject code that needs to be added to one of the five categories of the breadth requirements. MOHAWK courses fit within the languages and cultures category. Due to the timing of the creation of MOHAWK, the Registrar has also approved this as an addition to the live 2019-2020 calendar.

Registrar's Office

Residency Requirement

- 2. Motion:** To amend undergraduate calendar text to recognize there are exceptions to the residency rule in agreements with other institutions and to clarify that the location of offering is not intended to impact the requirement, effective 1 September 2020.

Background and Rationale:

The current text can be found at: <http://ugradcalendar.uwaterloo.ca/page/Acad-Regs-Residency-Requirement>

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

At least 50% of the University of Waterloo total degree requirements must be ~~taken while registered as a student at the University of Waterloo~~ **courses**. A graduate who is readmitted to pursue an additional degree must complete at least 50% of the requirements for the additional degree ~~at the~~ **with** University of Waterloo **courses**.

~~Note:~~ Degrees offered jointly with another academic institution (e.g., ~~2+2~~ **3+1** agreements) are ~~not~~ **normally** subject to the residency ~~policy~~ **requirement unless otherwise stipulated in the letter of agreement between institutions**.

Proposed text (clean):

At least 50% of the University of Waterloo total degree requirements must be University of Waterloo courses.

Degrees offered jointly with another academic institution (e.g., 3+1 agreements) are normally subject to the residency requirement unless otherwise stipulated in the letter of agreement between institutions.

A graduate who is readmitted to pursue another degree must complete at least 50% of the requirements for the additional degree with University of Waterloo courses.

INACTIVATION OF ACADEMIC PLANS
Faculty of Science

Honours Science and Business, Earth Sciences Specialization (Reg.)

3. **Motion:** That Senate approve the inactivation of the Honours Science and Business, Earth Sciences Specialization, regular stream, effective 1 September 2020.

Rationale: The regular stream of the Science and Business, Earth Sciences specialization was not inactivated with the co-op stream, effective September 1, 2018, because there were still China partner students being enrolled into the program. As a result of a steady decline in enrolment numbers and a discussion with the China partner University of Geosciences in Beijing (CUGB) to confirm that no new students would be accepted into the program after fall 2018, there is support to inactivate the program for September 1, 2020. The small number of students interested in the Earth Sciences specialization can readily be accommodated in the unspecialized stream of Science and Business.

FOR INFORMATION

Final Assessment Report – English Language Institute. Council’s reviewers commented favorably on the program and the report. Following discussion, Council approved the final assessment report on behalf of Senate. See Attachment #1.

MINOR PLAN & CURRICULAR MODIFICATIONS

Council approved the following on behalf of Senate:

- minor plan changes for the faculty of science (Honours Science and Business, Biology Specialization (Reg. and Co-op)).
- course changes for the faculties of arts (anthropology, special topics courses); science (pharmacy, science and business).
- course inactivations for the faculty of science (pharmacy)

/rmw

Mario Coniglio
Associate Vice-President, Academic



Final Assessment Report

English Language Institute (EFAS and BASE)

February 2019

Executive Summary

External reviewers found the non-credit programs –English for Academic Success (EFAS) and Bridge to Academic Success in English (BASE) – delivered by the English Language Institute (ELI) at Renison University College to be in very good standing.

“Overall, we conclude that this program is in very good standing, not least because it appears committed to continuous improvement. It has improved significantly in response to a previous external review and delivers high-quality, student-centered instruction that brings a significant number of international students to our region and to UW.”

A total of 8 recommendations were provided by the reviewers. These recommendations revolved around enhancing the profile of ELI and its instructors, integrating ELI with the main campus and recognizing the role of ELI in internationalization, as well as working to improve program metrics. In response, the English Language Institute created a plan outlining the specific actions proposed to address each recommendation as well as a timeline for implementation. The next cyclical review for this program is scheduled for 2024-2025.

Enrollment over the past three years

	EFAS	BASE (incl. iBASE)
2017-2018	455	194
2016-2017	518	166
2015-2016	441	103

Background

In accordance with the University of Waterloo’s Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the evaluation of the non-credit programs that pathway into UW delivered by the English Language Institute and the ELI’s response. A self-study (Volumes I, II, III) was submitted to the Associate Vice-President, Academic on December 18, 2017. The self-study (Volume I) presented the program descriptions and learning outcomes, an analytical assessment of the programs, including the data collected from a student survey,



along with the standard data package prepared by the Office of Institutional Analysis & Planning (IAP). The CVs for each faculty member with a key role in the delivery of the programs were included in Volume II of the self-study.

From Volume III, two arm's-length reviewers were selected by the Associate Vice-President, Academic: Dr. Brendon Larson, Professor and Associate Dean – Undergraduate Studies in the Faculty of Environment, and Dr. Victoria Lamont, Associate Professor in the Department of English Language and Literature.

Reviewers appraised the self-study documentation and conducted a site visit to the University on March 1, 2018. The visit included interviews with the President of Renison University College, the Director of Non-Degree Programs and Student Affairs, the Assistant Directors of ELI, instructors, program managers, staff and current students, and the Associate Vice-President, Academic. The review team also had an opportunity to tour the facilities and to meet with the librarian and student services staff.

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

Program characteristics

English for Academic Success (EFAS): The EFAS program consists of three 14-week terms running in the fall, winter, and spring as well as one 6-week summer intensive program (iEFAS). EFAS meets the English language requirement for both [undergraduate](#) and [graduate](#) studies and offers conditional admission to upper year studies.

Bridge to Academic Success in English (BASE): This program is designed to create a pathway to undergraduate studies for the Faculties of Arts, Applied Health Sciences, Engineering, Environment, and Science. The BASE program consists of two 12-week terms, which run concurrently with the University of Waterloo's fall and winter terms. There is also a 7-week intensive summer program ([iBASE](#)).

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

Strengths

- Validated curricula that corresponds to standardized tests
- Dedicated ELI staff
- Variety of student leadership opportunities
- Excellent working relationships with campus partners



Challenges

- Dependent upon existing University of Waterloo admissions framework
- ELI's goals and missions are often misunderstood
- Reliance on international students and therefore sensitive to global geopolitics and domestic policies that limit international student admissions (e.g., visa regulations)

Weaknesses

- Lack of a formal student information system
- Lack of appropriate space and student resources
- Lack of reflection time for analysis regarding program improvements

Summary of key findings from the external reviewers

The reviewers found that this program is in very good standing. It delivers high-quality, student-centered instruction that brings a significant number of international students to our region and to UW. The reviewers believe that the partnership of ELI with UW offers an exemplary model for other universities to follow. Both programs offer multilingual speakers a substantial learning experience that prepares them for success in all aspects of their academic program.

Program response to external reviewers' recommendations

Recommendations

1. Develop a comprehensive plan to raise the profile of the ELI as a key agent of internationalization for UW.

Response

The Director will have meetings with Waterloo International, Registrar's Office, Student Success Office (SSO), and Graduate Studies and Postdoctoral Affairs to discuss messaging and establish key stakeholders. The ELI will work with the SSO to devise a communication plan aimed at providing information to the UW community highlighting the support systems in place for international students. Further communication strategies will be considered to increase awareness of the ways ELI can be a part of Waterloo's internationalization strategy, which would include discussions with those who are working on the strategic plan (internationalization) as well as individuals in various units (including Centre of Teaching Excellence) and across campus. Although the ELI was not included in initial discussions regarding Waterloo's internationalization issue paper, which is meant to be the first step in strategic planning, ELI is hopeful, through multiple meetings with individuals, as suggested by the reviewers, that the ELI will still be considered as part of Waterloo's upcoming internationalization strategy. An initial meeting with Waterloo International has taken place and a discussion with the Director



of the SSO has confirmed the desire for a shared communication plan. Meetings with the SSO will continue throughout the summer with the hopes of creating a joint communication plan in the fall of 2018.

2. Improve recognition of the important role of ELI instructors at Renison and for UW.

Response

Because the instructors in the ELI are considered staff, not faculty, inequities exist between instructors in ELI and those within credit-bearing programs. The Assistant Directors and Director are having discussions on how to incorporate research into ELI instructors' responsibilities in order to bridge some of the gaps. There is research happening within the ELI, but because it is done in addition to the instructors' full workload, there is no time for the research to move to the steps of publication and presentation. Currently the results of the research are used to improve the program and are not shared broadly within the field of international education. In EFAS, the plan is to investigate the feasibility of having one non-teaching term every two years to work on a special project or conduct research (as explained under program characteristics, EFAS operates over 4 terms: Fall, Winter, Spring and an intensive 6-week summer term). BASE runs in the fall, winter and summer, and so most instructors are on 80% contracts. There is a plan to investigate the feasibility of moving people to full year contracts to work on special projects (i.e. curriculum and program development) or conduct research within the added 20% of the contract. Once these plans have been fleshed out with Renison's Finance, they will be brought to the President of Renison for approval. If all goes as planned, HR could create new contracts for May 2020 to coincide with the new fiscal year.

3. Work towards resolving space limitations at the ELI.

Response

Gaining sufficient access to space is an ongoing issue for many units at the university. The ELI has obtained a great deal of new space since the last program review. However, with the growth of the ELI and Renison as a whole, space remains a concern, especially in the Fall term. Because language teaching involves many hours, and as such, many instructors, having adequate office space is problematic. Unlike regular faculty, full-time instructors as well as Program Managers share space in double or triple person offices. It would not be feasible to provide single offices for the number of teaching staff the ELI has. Because sessional instructors are integral to the work of the ELI, when the new space was given, a large sessional office with multiple desks and workstations was created. This space has been furnished with instructor feedback in mind. The major concern with this space is that it is in the basement, below the full-time instructors' space. This creates a feeling of inequity, which is understandable given the location of the office. Unless new space is built, it does not seem likely that the location of the current sessional office can change.



Although gaining more space for both offices and classrooms is a priority for the ELI, it is decided at the Renison Board level.

4. Refresh course names so that they better indicate their purpose.

Response

The BASE team and the EFAS team will work on renaming the courses to better reflect the course content. For example, all writing-focused courses are currently called “Writing Skills”, but it is suggested these courses have names that better reflect the content and level of the course, such as “Introduction to Academic Writing and Research Skills” (BASE) and “Effective Writing and Research in Academic Contexts” (EFAS). The course names have been approved within the unit and at CAPE Council to meet Renison’s regulations. The course name changes are scheduled for approval at March 12, 2019 SUC.

5. Further diversify the representation of students from different countries in BASE.

Response

Recruitment for the BASE program is a joint effort between Marketing and Undergraduate Recruitment at UW and Marketing and Recruitment at Renison. Because Renison’s recruitment efforts are already in non-English speaking countries, we have access to information about potential opportunities for new student markets and existing government scholarship programs. Leveraging the SENEYCYT scholarship programs offered through Ecuador and Panama provides a good example of how Renison and uWaterloo’s recruitment teams have been able to work together. For the past three admission cycles, stakeholders from Renison and uWaterloo have collaborated to maximize efficiencies and enhance diversity within the student population. To extend this collaboration beyond efforts in Panama and Ecuador, many factors need to be considered. In order to have a comprehensive strategy, the two teams would benefit from joint strategic planning. If it is agreeable to work together in other markets, they could complete a comprehensive scan of the international recruitment opportunities. From there, developing a strategic plan (3-5 year) for international recruitment for ELI and UW and presenting this plan to appropriate bodies at both Renison and UW would be the final steps before implementation of the plan. ELI’s Director, Assistant Directors, and instructional staff will be on hand to help with outreach as required.

Regarding the recommendation for recruiting from the immigrant population, there is an obstacle that could complicate this. English Language is not a program that receives government funding and so there are not separate, lower, domestic rates. Additionally, students are not entitled to OSAP for English language programs at universities.

6. Explore further co-curricular opportunities for BASE students, especially in some faculties.



Response

To start, the Director and Assistant Director have reached out to the incoming Chair of Social Development Studies (at Renison) to explore joint learning opportunities. The hope is to increase BASE student participation in Arts in partnership with SDS. A sessional instructor was hired by the SDS Chair who has experience in this sort of programming. A meeting with SDS and BASE staff to flesh out a joint learning opportunity took place on November 1, 2018. The ELI has also reached out to the Associate Dean for Undergraduate Studies in the Faculty of Environment to explore opportunities for possible collaboration. Considering how to strengthen ties with AHS will be required once student numbers become more stable. There are already such opportunities for BASE Engineering and Science students. These opportunities will continue to be strengthened.

The reviewers also suggested that the ELI have semi-regular meetings with “the group of Associate Deans who have a vested interest in the success of ELI”. The Director will inquire to see if there is interest from the Associate Deans to have such meetings.

7. Develop concrete ways for EFAS to integrate experiences at UW into its programming.

Response

The EFAS program is in the midst of a curricular review and it was recommended that “the EFAS program should continue to explore and develop concrete connections and student experiences with the UW campus.” ELI was pleased to hear that the reviewers felt that “many if not most instructors at UW would be quite open to classroom visits” for EFAS students in order for them to have authentic lecture experiences. To this end, the Assistant Director will investigate opportunities for EFAS students to observe lectures at UW and/or invite guest lecturers to EFAS. Additionally, ELI was excited to learn that UW is developing a syllabus repository which will help EFAS instructors learn more about the expectations of students once in degree studies. This information can aid EFAS instructors in creating assignments that ensure the students have the appropriate foundation before beginning degree studies.

ELI also expects to integrate EFAS programming into students’ experiences through structured volunteer opportunities at UW events/activities (e.g., You@Waterloo Day, Canada Day).

ELI is also seeking ways to leverage units at UW to help facilitate co-curricular programming (e.g., visits to academic departments/faculties for academic excursions related to assignments).



8. Improve program metrics leading up to the next review.

Response

One of the larger issues the ELI faces is the lack of a student information/management system. Everything from the creation of acceptance letters and class lists to the collection of marks and production of transcripts is done manually. At the end of each term, certain metrics such as student statistics (numbers, country of origin) as well as student satisfaction (survey results on classes and activities) are compiled manually as well. Since the ELI students, with the exception of BASE students, are not in Quest, it is not possible to pull statistics as is standard practice at UW. Also most of the EFAS students have guest ID numbers rather than Waterloo student ID so if/when they move onto main campus, they cannot easily be tracked. A long time goal of the ELI has been to find a software system that will help with all of these functions. The ELI requires dedicated assistance from IT and Finance in order to purchase optimal software. This has been made a priority by Renison's President, and so it is hoped that the software will be in place by the end of the calendar year (2019).

Once the software is in place, Student Services ELI (SSTELI) and ELI admin team will discuss the various metrics that should be considered. The Administrative Coordinator will gather the information. Discussions will happen within BASE and EFAS teams to get further input. ELI admin team will review and make a decision on what should be included and how the items will be measured. After a trial period of one year, ELI will review the metrics to ensure they are gathering the most useful information. Revisions will be made as required.

One additional item that would allow ELI to improve metrics, and thus, programming, extends beyond the capabilities of an in-house student information/management system. To date, it has not been possible to make meaningful comparisons between ELI students short/long term study success and that of direct admits with passing ELT scores. It is possible for other institutions to measure the impact of various pathways; however, there exist specific issues (e.g., with the way that students are coded upon admission) that makes it difficult for this university. Nevertheless, such comparative metrics could provide valuable information, not only for ELI, but also for the entire university.



Implementation Plan

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	Develop a comprehensive plan to raise the profile of ELI as a key agent of internationalization for UW.	Have meetings with various units to discuss messaging and establish key stakeholders. Work with SSO on a communication plan.	Director	Implementation of the plan would begin in Spring 2019.
2.	Improve recognition of the important role of ELI instructors at Renison and for UW.	Investigate feasibility of adjusting contracts to provide time to expand research or special projects.	Director, Finance, President and HR	Contracts to be updated by May 1, 2020.
3.	Work towards resolving space limitations at the ELI.	In the upcoming strategic planning conversations at Renison, space issues at the College will be an item for discussion.	Strategic planning committee to Board of Governors and President to discuss possibility of building.	Upcoming conversations (2018/2019) with the Board of Governors to decide if plan to build is feasible.
4.	Refresh course names so that they better indicate their purpose.	Course name changes will go through the proper process as per UW policy.	Assistant Directors (renaming and rationale) Director (approval at CAPE council) Academic Dean and/or President (take to SUC and Senate)	Approved at SUC on March 12, 2019.
5.	Further diversify the representation of students from different countries in BASE.	Renison's Marketing and Recruitment office to initiate discussions to create a joint recruitment strategy with UW's Marketing and Undergraduate Recruitment team.	Manager and Senior International Recruitment Specialist at Renison, Associate Director, Marketing and Undergraduate Recruitment at UW.	Implementation of the plan would begin in Spring 2020.
6.	Explore further co-curricular opportunities for BASE students, especially in some faculties.	Work with appropriate people in faculties or departments to explore joint learning opportunities. Also inquire about having semi-regular discussions with Associate	Director/Assistant Director	May 2019



		Deans regarding ELI programming as it pertains to degree studies.		
7.	Develop concrete ways for EFAS to integrate experiences at UW into its programming.	Work with appropriate people on main campus to allow EFAS students to observe classes, participate in volunteer opportunities and visit academic units.	Assistant Director	Winter 2019
8.	Improve program metrics leading up to the next review.	Purchase student management software. Ascertain required metrics and means of collecting them. Implement, then review, and revise.	Administrative Coordinator and Student Experience Manager	Fully implemented by Fall 2021.

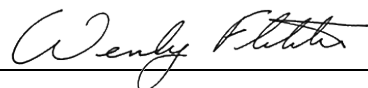
The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.



Date of next program review _____ **2024-2025**
Date

Signatures of Approval

 _____
Chair/Director _____ Date
March 21, 2019

 _____
AFIW Administrative Dean/Head (For AFIW programs only) _____ Date
March 21, 2019

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

 _____
Faculty Dean _____ Date
September 27, 2018

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

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

University of Waterloo
SENATE
Report of the President
21 May 2019

FOR INFORMATION

Recognition and Commendation

Six teams of graduating Waterloo Engineering students won financial backing this week as they work to develop their fourth-year design projects into businesses. The winners were picked by a panel of judges from 15 finalists at the Norman Esch Entrepreneurship Awards for Capstone Design, an annual pitch competition with more than \$60,000 in prize money.

- compr (Thevany Narayanamoorthy, Dhruv Gupta, Garvita Rai, Rhea Philip and Sam Villaluz – Management Engineering) for a single software platform for buyers to collect and aggregate data for reports the system automatically generates
- Atlas Medical (Colin Cooke, Jake Fisher, Michael Jonas and Daniel Zhou — Mechatronics Engineering) for a variable-stiffness mattress to prevent bedsores in bedridden patients.
- Stellar Care (Alexandra Leggett, Corinna Smith, Lynnea Tan and Ryan Tenant — Biomedical Engineering) for a mobile application to improve communication between homecare nurses and the families of children with complex medical needs.
- Stacktronic (Nicolas Benais-Thomson, Ethan Hamshaw, Robert Rowland, Riley Stone and Keith Teeple — Mechanical Engineering) for a plug-and-play battery system for industrial equipment companies, design teams and research groups.
- Reka (Laura Bingeman, Abiramy Kuganesan, Hannah Sennik and Nisa Sial — Systems Design Engineering) for technology to improve the speed and quality of speech for people with verbal challenges.
- Augeo Medical (Emily Lam, Anna Dong, Summer Kavan and Isabella Morgan — Biomedical Engineering) for a smart sensing system to alert amputees when their lower-limb prosthetics are poorly fitted.

(adapted from Engineering News, 4 April 2019)

President Feridun Hamdullahpur, along with Federation of Students (Feds) and Graduate Student Association (GSA), recognized undergraduate and graduate student leaders Monday night at the inaugural Presidents' Student Leadership Awards Banquet. The Feds and GSA each recognized undergraduate and graduate students at the award ceremony who each have shown leadership that have benefited the undergraduate and graduate community and improved student life, while the University of Waterloo's President honoured one undergraduate and one graduate student from those who were nominated for the Feds and GSA awards. The winners of the Presidents' Student Leadership Awards were recognized because of their distinguished leadership and dedication to the improvement of the entire University community.

Feds winners:

- Alex Lee
- Fiqir Worku
- Munaza Saleem
- Michael Li
- Kelsey-Ann Prior
- Akshay Jogoo
- Jimmy Quach
- Mikaela Ney
- Christopher Marcotte
- Mohammad Moussa

GSA winners:

- Linda Iheme
- Takin Tadayou
- Michael Makahnouk
- Beth Timmers
- Julia Goyal

Presidents' Student Leadership Winners:

- Munaza Saleem (undergraduate)
- Takin Tadayou (graduate)

(adapted from the Daily Bulletin, 11 April 2019)

Each month, the Office of the President recognizes students, faculty, staff and alumni who go above and beyond. The President's Accolades celebrate stories of dedication, passion and contribution from our University community. Congratulations to the University of Waterloo community members currently being recognized from March 2019:

- The Registrar's Office's "Spirit Crew" who have worked to raise funds (and spirits) in the department for 15 years;
- A team of Waterloo students who were among the winners of the NASA 2018 International Space Apps Challenge;
- Waterloo Kinesiology student Jocelyn Williams, who helped someone in need during the slippery season;
- The local chapter of Enactus Canada, who were crowned Regional Second Runner-Up at the Scotiabank Environmental Challenge and Scotiabank Youth Empowerment competition; and
- Electrical & Computer Engineering Manager of Undergraduate Studies Dave Harris, who works to improve the lives of students.

(adapted from the Daily Bulletin, 15 April 2019)

Keith Hipel, a professor of systems design engineering who earned his own three degrees as a student at Waterloo, was named today as one of five winners of 2019 Killam Prizes through the Canada Council for the Arts. (adapted from the Daily Bulletin, 25 April 2019)

On April 9, GreenHouse celebrated its 17th cohort of social innovators and entrepreneurs at the Social Impact Showcase. As part of this celebration, GreenHouse awarded grants from its Social Impact Fund. The winners of this term's Social Impact Fund are:

- **Prospr**, awarded \$1,000 from the Social Impact Fund. A venture dedicated to helping charities mobilize the funding by better sourcing and engaging community fundraisers and brand ambassadors from their existing donors.
- Recipient of \$2,000 from the Social Impact Fund, **#Stories of Us**, a venture that highlights

diverse female role models in STEM across Canada.

- **Rocket Care** was awarded \$4,000 from the Ministry of Seniors and Accessibility, a venture focused on improving scheduling methods for different forms of client appointments in healthcare.
- **VOYHS**, a venture giving trans people the resources to train their voice, boosting their confidence and quality of life. VOYHS was awarded \$2,000 from the Social Impact Fund and \$4,000 from the Ministry of Seniors and Accessibility.
- A venture aimed at improving speed and quality of speech for people with verbal challenges. **Reka**, was awarded \$10,000 for the Norman Esch Entrepreneurship Award for Engineering Capstone Design; \$5,000 from the Ministry of Seniors and Accessibility; and \$1,000 for the GreenHouse People's Choice award.

(adapted from the Daily Bulletin, 25 April 2019)

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

May 21, 2019

FOR INFORMATION

A. APPOINTMENTS

Adjunct Appointments

Graduate Supervision and Research

CLARK, Erica, Assistant Professor, School of Public Health and Health Systems, May 1, 2019 – April 30, 2021.

FERGUSON, Glenn, Assistant Professor, School of Public Health and Health Systems, March 15 2019 – December 31, 2022.

Special Appointments

Graduate Instruction

HYNDMAN, Brian, Lecturer, School of Public Health and Health Systems, May 1, 2019 – August 31, 2019.

VANDERLEE, Lana, Lecturer, School of Public Health and Health Systems, May 1, 2019 – August 31, 2019.

Undergraduate Instruction

BISHOP-WILLIAMS, Kate, Lecturer, School of Public Health and Health Systems, September 1, 2019 – December 31, 2019.

TONG, Catherine, Lecturer, School of Public Health and Health Systems, September 1, 2019 – December 31, 2019.

Cross Appointment

WILLETT, Thomas, Assistant Professor, Department of Systems Design Engineering, Faculty of Engineering to Department of Kinesiology, Faculty of Applied Health Sciences, March 1, 2019 – February 28, 2024.

Change in Postdoctoral Appointment

Velasquez Garcia, Hector, School of Public Health and Health Systems, **not coming**.

Change in Appointment

DAWCZYK, Anna, Research Associate, Department of Recreation and Leisure Studies, May 1, 2019 – August 31, 2019, appointment extension.

C. SABBATICAL LEAVES

To be approved by the Board of Governors

HUGHSON, Richard, Professor, Department of Kinesiology, January 1, 2020 – December 31, 2020, one year at 100% salary.

JANES, Craig, Professor and Director, School of Public Health and Health Systems, July 1, 2020 – June 30, 2021, one year at 100% salary.

OREMUS, Mark, Associate Professor, School of Public Health and Health Systems, January 1, 2020 – June 30, 2020, early six-month sabbatical leave at 85% salary.

TYAS, Suzanne, Associate Professor, School of Public Health and Health Systems, September 1, 2019 – August 31, 2020, one year at 100% salary.



Paul Stolee, Interim Dean
Faculty of Applied Health Sciences

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

FOR INFORMATION

A. APPOINTMENTS

Tenure

SAUL, Jennifer, (BA 1990 University of Rochester, MA 1994, PhD 1996 Princeton University), Professor, Department of Philosophy, August 15, 2019. Professor Saul works on topics in Philosophy of Language, Feminism, Philosophy of Race, and Philosophy of Psychology, and is currently senior lecturer at the University of Sheffield. She is the author of several books, including, most recently *Lying, Misleading and What is Said: An Exploration in Philosophy of Language and in Ethics* (Oxford University Press 2012), and is the winner of the Philip Leverhulme Prize (2003) and the Distinguished Woman Philosopher of the Year Award (2011). At the University of Waterloo, she will be the Waterloo Chair in Social and Political Philosophy of Language.

Probationary Term Appointments

BRUCE-LOCKHART, Katherine, (BA 2012 University of Toronto, MSc 2013 St. Antony's College, University of Oxford, PhD 2017 Trinity College, University of Cambridge), Assistant Professor, Department of History, June 17, 2019 to June 30, 2022. Currently a SSHRC postdoctoral fellow at the Jackman Humanities Institute and the Department of Historical Studies at the University of Toronto, Bruce-Lockhart's research examines the postcolonial afterlives of the prison, with a particular focus on the African continent. She has published on the carceral state, and particularly the detention of Mau Mau women in colonial Kenya, in the *Journal of Eastern African Studies*, the *Journal of World History*, and the edited collection *Decolonization and Conflict: Colonial Comparisons and Legacies*. Bruce-Lockhart is in the final stages of completing a manuscript entitled *Carceral Modernities: Prison Officers, Professionalism, and the Postcolonial State in Uganda*. Both the Tri-University Graduate History program and the Balsillie School of International Affairs, particularly those engaged in the "Conflict and Security" and "Indigenous Peoples, Decolonization and the Globe" Research Clusters will be enriched by this research expertise. Bruce-Lockhart's undergraduate and graduate teaching features interdisciplinary frameworks, a focus on methodology, active and accessible learning strategies, and engagement in debates that currently animate the public sphere. At Waterloo, she will forge connections to enhance students' experiential learning while also situating the University in the wider communities in which it operates. In particular, Bruce-Lockhart would like to engage with the Walls to Bridges program, which brings together students and incarcerated individuals for university-level courses, and is currently in operation at the Grand Valley Institution for Women in Kitchener.

HEBBINCKUYS, Nicolas, (Licence ès Lettres modernes 2005 Maîtrise en Littérature comparée 2006 ICES (France), PhD 2015 Université de Moncton), Assistant Professor, Department of French Studies, July 1, 2019 to June 30, 2022. Dr. Nicolas Hebbinckuys currently holds a Definite-Term Lecturer position in the Department of French Studies. His main areas of research are 17th-Century French Literature, pre-modern Accounts of Travel, and the work of the lawyer, traveller, historian and poet Marc Lescarbot (c. 1570–1641). Dr. Hebbinckuys has also been actively involved, since his first appointment in French Studies, in Second Language (FSL) pedagogy initiatives, and online and interactive teaching projects.

Continuing Lecturer Appointments

ANDRES, Greg, (BA 1998 Briercrest College, BA 2001, MA 2002 University of Waterloo, PhD 2007 University of Western Ontario), Continuing Lecturer, Department of Philosophy, May 1, 2019.

CARSON, Linda, (BMath 1985 BA 1990 University of Waterloo, MFA 1993 University of Saskatchewan, MSc 2004 PhD 2013 University of Waterloo), Continuing Lecturer, Stratford School of Interaction Design and Business, May 1, 2019.

CEGYS, Paul, (BA 2008 University of Toronto, MSc 2011 Lund University), Continuing Lecturer, Department of Communication Arts, May 1, 2019.

DADEY, Bruce, (BPE 1981, BA 1985 University of Manitoba, BEd 1989 University of Alberta, MA 1995 PhD 2006 University of Waterloo), Continuing Lecturer, Department of English Language and Literature May 1, 2019.

DI RUZZA, Vince, (BA 1985 University of Guelph), Continuing Lecturer, Department of Psychology, May 1, 2019.

GEORGE, Ryan, (BSc, BA 2002 University of Victoria, MA 2004 University of Toronto, MA 2005 York University, PhD 2011 McMaster University), Continuing Lecturer, Department of Economics, May 1, 2019.

MOLL, Sorouja, (BA 2007, MA 2008 University of Guelph, PhD 2013 Concordia University), Continuing Lecturer, Department of Communication Arts, May 1, 2019.

PENATE, Rocky, (BA 2002 University of Western Ontario, PhD 2011 University of Toronto, Bed 2014 Brock University), Continuing Lecturer, Department of French Studies, May 1, 2019.

SEEDS, Pamela, BSc 2005 Queen's University, MSc 2007 PhD 2013 University of Western Ontario), Continuing Clinical Lecturer, Department of Psychology, May 1, 2019.

WEHR, Paul, (BA 1994 McMaster University, MA 1998 California State University, PhD 2005 University of British Columbia), Continuing Lecturer, Department of Psychology, May 1, 2019.

Definite Term Appointments

DRAINVILLE, Raymond, (BA 1992 New College, Sarasota Florida, MA 1995 Princeton University, MA 1996 University of Sheffield, PhD 2018 Manchester School of Art), Assistant Professor, Stratford School of Interaction Design and Business, August 15, 2019 to August 14, 2022. Professor Drainville's research examines the intersections between iconography and social media imagery. He employs iconography to understand why people find some pictures more resonant than others. Professor Drainville will join the Stratford School of Interaction Design and Business in the fall of 2019 where he will continue to pursue his research interests and deliver a number of intermediate and senior undergraduate courses.

ROHANI, Laila, (BA 1998 Sookmyung Women's University, MBA 2000, PhD 2016 University of Guelph), Lecturer, School of Accounting and Finance, April 11, 2019 to June 30, 2021. Laila received her PhD in Marketing from the University of Guelph. Her work covered multiple areas in the field of marketing, including the evaluation of marketing effectiveness. Well versed in Analytics, Laila joins the School Data Analytics group and will teach in the School's undergrad programs.

Definite Term Reappointments

DUCHARME, Robert, Lecturer, School of Accounting and Finance, May 1, 2019 to June 30, 2020.

HARRIGAN, Kevin, Lecturer, Stratford School of Interaction Design and Business, May 1, 2019 to April 30, 2020.

Definite Term reappointments – Change in Date

HEBBINCKUYS, Nicolas, Lecturer, Department of French Studies **from** January 1, 2018 to December 31, 2019 **to** January 1, 2018 to June 30, 2019.

Visiting Appointment

LEI, Yanhong, Visiting Scholar, Department of Political Science, July 8, 2019 to July 7, 2020.

LI, En, Visiting Scholar, Department of Psychology, July 1, 2019 to December 31, 2019.

Visiting Reappointment

BURKETT, Jodi, Visiting Scholar, Department of History, April 1, 2019 to June 30, 2019.

Adjunct Appointments – Instruction

LAURILA, Kelly, Lecturer, Department of Sociology and Legal Studies, May 1, 2019 to August 31, 2019.

NORTON, Roy, Lecturer, Department of Political Science, May 1, 2019 to August 31, 2019.

Adjunct Reappointments – Instruction

ADAMS, Russell, Assistant Professor, Department of Anthropology, May 1, 2019 to August 31, 2019.

ALEKBEROV, Elshan, Lecturer, Department of Economics, May 1, 2019 to August 31, 2019.

BALAISIS, Nicholas, Lecturer, Department of Fine Arts, May 1, 2019 to August 31, 2019.

BOEHMER, Greg, Lecturer, School of Accounting and Finance, January 1, 2019 to April 30, 2019.

CARVER, Matthew, Lecturer, Department of Fine Arts, May 1, 2019 to August 31, 2019.

COREY, Dylan, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

DATARDINA, Malik, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

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

DOLSON, Mark, Lecturer, Department of Anthropology, May 1, 2019 to August 31, 2019.

EVERITT, Bruce, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

FATIMA, Nafeez, Lecturer, Department of Anthropology, May 1, 2019 to August 31, 2019.

FERNANDEZ, Stephen, Department of English Language and Literature, May 1, 2019 to August 31, 2019.

GAMEZ, Hector, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

GAZZOLA, Lynn, Lecturer, Faculty of Arts, May 1, 2019 to August 31, 2019.

GERNON, Marc, Lecturer, Department of Psychology, May 1, 2019 to August 31, 2019.

HAYES, Nicole, Lecturer, Department of Anthropology, May 1, 2019 to August 31, 2019.

HUNTER, Natalie, Lecturer, Department of Fine Arts, May 1, 2019 to August 31, 2019.

HUTTER, Daniel, Lecturer, Department of Classical Studies, May 1, 2019 to August 31, 2019.

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

LESIUK, Michael, Lecturer, Department of English Language and Literature, May 1, 2019 to August 31, 2019.

LIAQAT, Zara, Lecturer, Department of Economics, May 1, 2019 to August 31, 2019.

LIN, David, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

MALAMET, Elliott, Lecturer, Department of Religious Studies, May 1, 2019 to August 31, 2019.

MCDERMOTT, Neil, Lecturer, Department of Psychology, May 1, 2019 to August 31, 2019.

NEEDHAM, Brent, Lecturer, Department of Political Science, May 1, 2019 to August 31, 2019.

NUNEZ, Camelia, Lecturer, Faculty of Arts, May 1, 2019 to August 31, 2019.

OZKARDAS, Ahmet, Lecturer, Department of Economics, May 1, 2019 to August 31, 2019.

PECKHAM, William, Lecturer, Department of Psychology, May 1, 2019 to August 31, 2019.

RAJSIC, Predrag, Lecturer, Department of Economics, May 1, 2019 to August 31, 2019.

SIMEONI, Laura, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

TIMBERG, Robert, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

WENSLEY, Karen, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

WU, Brian, Lecturer, School of Accounting and Finance, May 1, 2019 to August 31, 2019.

Graduate Students Appointed as Part-Time Lecturers

ARCILA-VASQUEZ, Andres, Department of Economics, May 1, 2019 to August 31, 2019.

CARPENTER, Justin, Department of English Language and Literature, May 1, 2019 to August 31, 2019.

GIBSON, Ian, Department of English Language and Literature, May 1, 2019 to August 31, 2019.

MITCHELL, S. James, Department of French Studies, May 1, 2019 to August 31, 2019.

MORTON, Robert, Department of Sociology and Legal Studies, May 1, 2019 to August 31, 2019.

ROWLAND, Samuel, Department of English Language and Literature, May 1, 2019 to August 31, 2019.

SAMUELS, Kanika, Department of Sociology and Legal Studies, May 1, 2019 to August 31, 2019.

VERBORA, Antonio (Tony), Department of Sociology and Legal Studies, May 1, 2019 to August 31, 2019.

WOJCIECHOWSKI, Christine, Department of Sociology and Legal Studies, May 1, 2019 to August 31, 2019.

Staff Appointments to Faculty

DI GRAVIO, Katrina, Lecturer, Department of Psychology, May 1, 2019 to August 31, 2019.

B. ADMINISTRATIVE APPOINTMENTS

GAUTHIER, Nicolas, Associate Chair, Graduate Studies, Department of French Studies, July 1, 2019 to June 30, 2021.

KAMINSKAIA, Svetlana, Associate Chair, Undergraduate Studies, Department of French Studies, July 1, 2019 to June 30, 2021.

Administrative Reappointment

HARDIMAN, Craig, Associate Chair, Undergraduate and Graduate Studies, Department of Classical Studies, July 1, 2019 to June 30, 2020.

ROY, Susan, Associate Chair, Graduate Studies, Department of History, April 1, 2019 to March 31, 2021.

ROZOTTO, David, Associate Chair, Undergraduate Studies, Department of Spanish Latin American Studies, May 1, 2019 to December 31, 2019

C. SABBATICAL LEAVES

For approval by the Board of Governors:

KITCHEN, Veronica, Associate Professor, Department of Political Science, September 1, 2019 to August 31, 2020, twelve months at 85% salary.

MCGUIRK, Kevin, Associate Professor, Department of English Language and Literature, September 1, 2019 to August 31, 2020, twelve months at 85% salary.

NORTH, John, Professor, Department of English Language and Literature, July 1, 2019 to June 30, 2020, twelve months at 85% salary.

Approved by the Board of Governors

BRUCE, Gary, Professor, Department of History, July 1, 2019 to June 30, 2020, twelve months at full salary.

DRAKE, Anna, Assistant Professor, Department of Political Science, July 1, 2019 to December 31, 2019, six months at 100% salary.

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

FULFER, Katy, Assistant Professor, Department of Philosophy, July 1, 2019 to December 31, 2019, six months at 100% salary.

GALLUPE, Owen, Associate Professor, Department of Sociology and Legal Studies, July 1, 2019 to December 31, 2019, six months at 85% salary.

HENNE, Kathryn, Assistant Professor, Department of Sociology and Legal Studies, July 1, 2019 to December 31, 2019, six months at 100% salary.

HOEPPE, Götz, Associate Professor, Department of Anthropology, July 1, 2019 to December 31, 2019.

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

SKIDMORE, James, Associate Professor, Department of Germanic & Slavic Studies, July 1, 2019 to June 30, 2020, twelve months at 85% salary.

SZEMAN, Imre, Professor, Department of Communication Arts, January 1, 2020 to June 30, 2020, six months at 85% salary.

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

D. UNPAID LEAVE

RASMUSSEN, Ann Marie, Professor, Department of Germanic and Slavic Studies, January 1, 2020 to April 30, 2020.

SHEN, Winny, Associate Professor, Department of Psychology, July 1, 2019 to June 30, 2020.

E. ADMINISTRATIVE LEAVES

Approved by the Board of Governors:

BOEHRINGER, Michael, Associate Professor, Department of Germanic & Slavic Studies, September 1, 2019 to December 31, 2019.

LISTON, Maria, Associate Professor, Department of Anthropology, January 1, 2020 to April 30, 2020.

Douglas M. Peers
Dean, Faculty of Arts

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

FOR INFORMATION

A. *APPOINTMENTS*

New Definite Term- full-time

NAAHIDI, Sheva, Research Assistant Professor, Department of Electrical & Computer Engineering, March 1, 2019 – February 29, 2020. PhD, University of Waterloo, Waterloo, ON, 2013; MSc, University of Waterloo, Waterloo, ON, 2007; BSc, Hons., University of Waterloo, Waterloo, ON, 2004. She will be working closely with Prof. Ali Safavi-Naeini on an industrial collaboration related to biologically inspired solar cells.

NASSAR, Mohammed, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – April 30, 2020. PhD, University of Waterloo, Waterloo, ON, 2017. MSc, Alexandria University, Alexandria Egypt, 2010; BSc, Alexandria University, Alexandria, Egypt, 2010; BSc, Alexandria University, Alexandria Egypt, 2006. will be teaching several courses in the Electrical and Computer Engineering, as well as Mechatronics Engineering programs. He will also help us out with first year circuits courses.

New Definite Term Reappointment- full-time

BORJI, Amir, Research Assistant Professor, Department of Electrical & Computer Engineering, April 1, 2019 – April 30, 2019.

New Definite Term Reappointment- part-time

SALISBURY, Christopher, Assistant Professor, Department of Mechanical & Mechatronics Engineering, May 1, 2019 – April 30, 2022.

Visiting Appointments

CAO, Juan, Researcher, Department of Electrical & Computer Engineering, June 1, 2019 – May 31, 2020.

CHEN, Hui, Scholar, Department of Systems Design Engineering, March 31, 2019 – March 30, 2020.

ISMENIA, Maria, Scholar, Department of Mechanical & Mechatronics Engineering, August 5, 2019 – August 4, 2020.

KAZEMI, Nasser, Professor, Department of Chemical Engineering, April 1, 2019 – March 31, 2020.

LIANG, Ruilin, Scholar, Department of Chemical Engineering, February 1, 2019 – December 31, 2019.

KANG, Hui-Fang, Scholar, Department of Mechanical & Mechatronics Engineering, March 23, 2019 – March 22, 2020.

LE MEUR, Pauline, Researcher, Department of Mechanical & Mechatronics Engineering, June 1, 2019 – August 31, 2019.

LIU, Zhijun, Scholar, Department of Electrical & Computer Engineering, April 2, 2019 – April 1, 2020.

OCHIAI, Hideki, Professor, Department of Electrical & Computer Engineering, March 16, 2019 – August 31, 2019.

QASIM, Khan, Scholar, Department of Mechanical & Mechatronics Engineering, July 1, 2019 – June 30, 2021.

SON, Young Kap, Researcher, Department of Systems Design Engineering, February 20, 2019 – February 19, 2020.

WANG, Sumei, Scholar, Department of Mechanical & Mechatronics Engineering, March 16, 2019 – February 29, 2020.

XIANDONG, Jiang, Scholar, Department of Civil & Environmental Engineering, April 2, 2019 – April 1, 2020.

ZHANG, Jun, Scholar, Department of Electrical & Computer Engineering, June 1, 2019 – May 31, 2020.

ZHANG, Lipeng, Scholar, Department of Mechanical & Mechatronics Engineering, June 1, 2019 – May 31, 2020.

Visiting Reappointments

GAO, Zhen, Scholar, Department of Electrical & Computer Engineering, March 1, 2019 – March 1, 2020.

KONG, Zhe, Scholar, Department of Electrical & Computer Engineering, July 16, 2019 – August 31, 2019.

Special Appointments

Undergraduate Instruction

DEHART, Brandon, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

GAOUDA, Ahmed, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

MORENO, Carlos, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

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

TAHERKHANI, Gita, Lecturer, Department of Management Sciences, May 1, 2019 – August 31, 2019.

WALTHO (MASON), Cynthia, Lecturer, Department of Management Sciences, May 1, 2019 – August 31, 2019.

WRIGHT, Derek, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

ZHENG, Yaxin, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

Special Appointments

Graduation Instruction

AMAR, Haitham, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

AU, Jason, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

EL-SHATSHAT, Ramadan, Lecturer, Department of Electrical & Computer Engineering, January 1, 2019– April 30, 2019.

JAYARAM, Shesha, Lecturer, Department of Electrical & Computer Engineering, January 1 2019 – April 30, 2019.

SALAMA, Magdy, Lecturer, Department of Electrical & Computer Engineering, January 1, 2019– April 30, 2019.

ZARGARI, Navid, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

Special Appointments

Research

DICECCO, SANTE, Research Associate, Department of Mechanical and Mechatronics Engineering, April 1, 2019 – April 2, 2021.

Special Reappointments

Graduate Instruction

ALLARAKHIA, Minna, Lecturer, Department of Management Sciences, May 1, 2019 - August 31, 2019.

Adjunct Appointments

Undergraduate Instruction

SAAD, John, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – August 31, 2019.

Adjunct Appointments

Graduate Supervision and Research

BERTHELOT, Curtis, Professor, Department of Civil and Environmental Engineering, April 1, 2019 – March 31, 2021.

BEUDAERT, Xavier, Assistant Professor, Department of Mechanical & Mechatronics Engineering, April 1, 2019 – March 31, 2022.

EL-SAADANY, Ehab, Professor, Department of Electrical & Computer Engineering, April 1, 2019 - June 30, 2022.

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

MESQUITA, Maria, Assistant Professor, Department of Civil & Environmental Engineering, April 1, 2019 – May 1, 2021.

SANGARY, Nagula, Associate Professor, Department of Electrical & Computer Engineering, January 1, 2019 – June 30, 2021.

TAMBLYN, Malcolm Thomas Isaac, Assistant Professor, Department of Electrical & Computer Engineering, February 4, 2019 – June 30, 2022.

THULASIRAMAN, Krishnaiyan, Professor, Department of Electrical & Computer Engineering, March 1, 2019 – June 30, 2022.

Adjunct Reappointments

Undergraduate Instruction

Zarnett, Jeffrey, Lecturer, Department of Electrical & Computer Engineering, May 1, 2019 – April 30, 2020.

Adjunct Reappointments

Research and Graduate Supervision

SALISBURY, Christopher, Assistant Professor, Department of Mechanical & Mechatronics Engineering, May 1, 2019 – April 30, 2022.

Cross Appointments

EVANS, G. Stephen, Professor, Earth & Environmental Sciences to Civil & Environmental Engineering, January 1, 2019 – February 28, 2020.

NACKE, Lennart E., Associate Professor, Department of Communication Arts to Department of Systems Design Engineering, January 1, 2019 – December 31, 2021.

NAZAR, Linda, Professor, Department of Chemistry to Department of Electrical & Computer Engineering, January 1, 2019 – December 31, 2021.

Changes in Appointments

FIEGUTH, Paul, Chair, Department of Systems Design Engineering, September 1, 2018 – March 31, 2019. Change in end date from August 31, 2020 to March 31, 2019.

LI, Yan, Researcher, Department of Electrical & Computer Engineering, May 1, 2018 – April 12, 2019. Change in end date from April 30, 2019 to April 12, 2019.

Transfers

ARMITAGE, Howard, Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

BASIR, Nada, Assistant Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

BANSAL, Harvir, Associate Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

BOEKHORST, Janet, Assistant Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

DALZIEL, Margaret, Associate Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

HOLT, Christopher, Lecturer, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

MALHOTRA, Shavin, Associate Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

REDDY, Roopa, Lecturer, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

SPARKES, Douglas, Continuing Lecturer, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

WEBER, Mark, Professor, Dean of Engineering Office/Faculty of Engineering to the Conrad School of Entrepreneurship and Business, June 18, 2018.

B. ADMINISTRATIVE APPOINTMENTS

HEPPLER, Glen, Director, Biomedical Engineering, March 1, 2019 – December 31, 2019.

ADMINISTRATIVE REAPPOINTMENTS

AUCOIN, Marc, Academic Director, WatPD-Engineering, May 1, 2019 – April 30, 2020.

BISHOP, William, Director, P&L Venture Creation Fund-2019, May 1, 2018 – April 30, 2019.

GORBET, Maud, Interim Chair, Department of Systems Design Engineering, April, 2019 – March 31, 2020. (Change to Stipend).

SIVOTHTHAMAN, Siva, Associate Dean, Graduate Studies, Department of Electrical & Computer Engineering, August 1, 2019 – July 31, 2022.

FOR APPROVAL BY THE BOARD OF GOVERNORS

C. SABBATICAL

BASU, Dipanjan, Associate Professor, Department of Civil & Environmental Engineering, July 1, 2019 – December 31, 2019, six months at 85% salary.

CASCANTE, Giovanni, Professor, Department of Civil & Environmental Engineering, July 1, 2019 – December 31, 2019, six months at 85% salary.

ERKORKMAZ, Kaan, Professor, Department of Mechanical and Mechatronics Engineering, September 1, 2019 – August 31, 2020, twelve months at 98.9%.

HELLINGA, Bruce, Professor, Department of Civil & Environmental Engineering, September 1, 2019 – August 31, 2020, twelve months at 100% salary.

HUCK, Peter, Professor, Department of Civil & Environmental Engineering, July 1, 2019 – December 31, 2019, six months at 85% salary.

LAMBERT, Stephan, Professor, Department of Mechanical and Mechatronics Engineering, September 1, 2019 – August 31, 2020, twelve months at 100% salary.

THOMSON, Neil R., Professor, Department of Civil & Environmental Engineering, September 1, 2019 – August 31, 2020, twelve months at 100% salary.



Pearl Sullivan
Dean, Faculty of Engineering

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

FOR INFORMATION

A. APPOINTMENTS

Probationary Term Appointment

McCORDIC, Cameron, Assistant Professor, School of Environment, Enterprise and Development [SEED], July 1, 2019 to June 30, 2022: PhD, Waterloo, 2016; MSc, University of Guelph, 2012; BSc, McMaster University, 2008. Dr. McCordic currently holds a Postdoctoral Fellow appointment in SEED and previously held an IPaSS Postdoctoral Fellowship at the Balsillie School of International Affairs. His research centers on Urban Sustainable Development and its intersections with International Development, Sustainability Management, Local Economic Development, and Qualitative and Quantitative Methods. His publication record to date, and his demonstrated expertise in contributing to teaching across programs in SEED, indicate that he will be a valuable asset to the School.

Probationary Term Reappointment

TRANT, Andrew, Assistant Professor, School of Environment, Resources and Sustainability, July 1, 2019 to June 30, 2022: PhD, Memorial University, 2012; MSc, Acadia University, 2006; BSc, University of Guelph, 2001.

Adjunct Appointment

Graduate Supervision

FERGUSON, Kristyn, MES Committee Member, School of Environment, Resources and Sustainability, March 1, 2019 to February 28, 2021.

Special Appointments

Instruction

McKENZIE, Ian, Lecturer, Department of Geography and Environmental Management, May 1, 2019 to August 31, 2019.

TAIT, Morgan, Lecturer, School of Environment, Resources and Sustainability, May 1, 2019 to August 31, 2019.

Graduate Students appointed as Part-time Lecturers

MORTON NINOMLYA, Scott, Department of Geography and Environmental Management, May 1, 2019 to August 31, 2019.

POPOVIC, Natasa, Department of Geography and Environmental Management, May 1, 2019 to August 31, 2019.

SABERI, Nastaran, Department of Geography and Environmental Management, May 1, 2019 to August 31, 2019.

THOMPSON, Aaron, Department of Geography and Environmental Management, May 1, 2019 to August 31, 2019.

VAN HUIZEN, Brandon, Department of Geography and Environmental Management, May 1, 2019 to August 31, 2019.

B. ADMINISTRATIVE APPOINTMENT - Revision

PLAISANCE, Kathryn, Associate Chair, Undergraduate Studies, Department of Knowledge Integration, July 1, 2016 to ~~June 30, 2019~~ December 31, 2019.

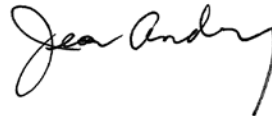
C. SABBATICAL LEAVES

For Approval by the Board of Governors

LYNES, Jennifer, Associate Professor, School of Environment, Enterprise and Development, July 1, 2019 to December 31, 2019, at 85% salary.

MINAKER, Leia, Assistant Professor, School of Planning, July 1, 2019 to December 31, 2019, at 100% salary.

PARKER, Dawn, Professor, School of Planning, July 1, 2019 to December 31, 2019, at 85% salary.



Jean Andrey
Dean

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

FOR INFORMATION

A. APPOINTMENTS (already approved by the Board of Governors)

Tenured

ASOKAN, Nadarajah (BTech, 1988, Indian Institute of Technology; MSc, 1989, Syracuse University; PhD, 1998, University of Waterloo), Professor, David R. Cheriton School of Computer Science, September 1, 2019. Prof. Asokan is a leading researcher in computer systems security, where he has made deep contributions and had broad impact both in academic research and through industry contributions. He is a Fellow of the Associate of Computing Machinery (the ACM) and a Fellow of the IEEE. Following a PhD from Waterloo in 1998 he has been a researcher at Nokia Research (Finland) from 1999-2012 and Professor at Aalto University (Finland) since 2013. Prof. Asokan will hold a David R. Cheriton Chair in Software Systems.

Probationary-Term Reappointments

WALLACE, Michael, Assistant Professor, Dept. of Statistics and Actuarial Science, July 1, 2019 – June 30, 2022.

Definite Term - Reappointments

AKASH, Mukto, Lecturer, Office of the Dean, April 29, 2019 – April 28, 2020.

Visiting Appointments

CRUZ CORTES, Nareli (Instituto Politécnico Nacional), Scientist, Dept. of Combinatorics and Optimization, August 15, 2019 – August 14, 2020.

GAO, Zhenlong, Researcher, Dept. of Statistics and Actuarial Science, October 1, 2019 – September 30, 2021.

LETIZIA, Marco, Research Associate, Dept. of Applied Mathematics, July 1, 2019 – December 31, 2019.

LIN, Hao, Research Associate, David R. Cheriton School of Computer Science, June 1, 2019 – May 31, 2020.

McGRATH, Joshua (University of Wisconsin-Madison), Scholar, David R. Cheriton School of Computer Science, April 15, 2019 – September 30, 2019.

PARAND, Kourosh (Shahid Beheshti University), Professor, Dept. of Statistics and Actuarial Science, September 1, 2019 – August 31, 2020.

REYHANI-MASOLEH, Arash (Western University), Professor, David R. Cheriton School of Computer Science, July 1, 2019 – June 30, 2020.

RODRIGUEZ-HENRIQUEZ, Francisco Jose Rambo (CINVESTAV, Mexico), Scientist, Dept. of Combinatorics & Optimization, September 1, 2019 – August 31, 2020.

Adjunct Appointments

Instructor

COLEMAN, Joey (Kira Systems), Lecturer, David R. Cheriton School of Computer Science, May 1, 2019 – August 31, 2019.

Adjunct Reappointments

Instructor

AL MASHAGBEH, Mohammad, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

AKBARI, Kamran, Lecturer, Dept. of Applied Mathematics, May 1, 2019 – August 31, 2019.

ALI, Javid, Lecturer, Dept. of Statistics and Actuarial Science, May 1, 2019 – August 31, 2019.

ANDERSON, Jeff, Lecturer, Office of the Dean, May 1, 2019 – April 30, 2021.

BISLIMOVSKA, Bojana, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

CAMACHO, Fernando, Lecturer, Dept. of Statistics and Actuarial Science, May 1, 2019 – August 31, 2019.

CHAN, Sarah, Lecturer, Office of the Dean, September 1, 2019 – August 31, 2020.

CRAWFORD-BROWN, Jessica, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

EDALATZADEH, Mohammad, Lecturer, Dept. of Applied Mathematics, May 1, 2019 – August 31, 2019.

EMMS JONES, Sandra, Lecturer, Office of the Dean, March 25, 2019 – December 31, 2019.

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

KARABINA, Burcu, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

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

LEE, Brenda, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

McKINNON, Jennifer, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

ROH, Patrick, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

SELLAROLI, Giuseppe, Lecturer, Dept. of Applied Mathematics, May 1, 2019 – August 31, 2019.

SORENSEN, Ashley, Lecturer, Office of the Dean, September 1, 2019 – August 31, 2021.

TURNER, Graeme, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

VICENTE-COLMENARES, Alejandra, Lecturer, Office of the Dean, May 1, 2019 – August 31, 2019.

YANG, Xu, Lecturer, Dept. of Pure Mathematics, May 1, 2019 – August 31, 2019.

Research

OLIVEIRA, Toacy (Federal University of Rio de Janeiro), Associate Professor, April 1, 2019 – June 30, 2022.

Graduate Students appointed as Part-time Lecturers

SIVAS, Abdullah Ali, Dept. of Applied Mathematics, May 1, 2019 – August 31, 2019.

Graduate Students reappointed as Part-time Lecturers

CASTANEDA SANTOS, Diana, Dept. of Pure Mathematics, May 1, 2019 – August 31, 2019.

MOSUNOV, Anton, Dept. of Pure Mathematics, May 1, 2019 – August 31, 2019.

PHARAON, Joe, Dept. of Applied Mathematics, May 1, 2019 – August 31, 2019.

Postdoctoral Fellows appointed as Part-time Lecturers

HU, Fei, Dept. of Pure Mathematics, August 1, 2019 – July 31, 2021.

ROSSEGGER, Dino, Dept. of Pure Mathematics, August 1, 2019 – July 31, 2021.

B. RETIREMENT

GODSIL, Christopher, Professor, Dept. of Combinatorics & Optimization, effective April 30, 2019.

SIEGEL, David, Professor, Dept. of Applied Mathematics, effective April 30, 2019.

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

ATLEE, Joanne, Professor, David R. Cheriton School of Computer Science, September 1, 2019 – August 31, 2020, with 85% salary.

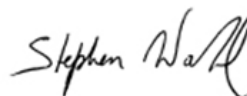
LABAHN, George, Professor, David R. Cheriton School of Computer Science, September 1, 2019 – August 31, 2020, with 100% salary.

LEMIEUX, Christiane, Professor, Dept. of Statistics and Actuarial Science, July 1, 2019 – June 30, 2020, with 100% salary.

RHEBERGEN, Sander, Assistant Professor, Dept. of Applied Mathematics, January 1, 2020 – June 30, 2020, with 100% salary. This is a special early sabbatical.

SALEM, Kenneth, Professor, David R. Cheriton School of Computer Science, September 1, 2019 – August 31, 2020, with 85% salary.

WONG, Bernard, Associate Professor, David R. Cheriton School of Computer Science, July 1, 2019 – June 30, 2020, with 85% salary.



Stephen M. Watt
Dean

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

For information:

A. APPOINTMENTS

New Probationary Term

KALYAANAMOORTHY, Subha, Assistant Professor, Department of Chemistry, October 1, 2019 to June 30, 2023. [M.Sc., Annamalai University (2007); Ph.D. La Trobe University (2013).] Dr. Kalyaanamoorthy is a NSERC Postdoctoral Fellow in Pharmaceutical Sciences at the University of Alberta. Before taking up this prestigious position in 2018, she received her Ph.D. in Computational Biology and Bioinformatics from La Trobe University in Australia, and her integrated M.Sc. in Bioinformatics from Annamalai University in India. She has also held appointments as a Junior Research Fellow and Teaching Faculty from 2007-2009 at Anna University in India, and as a Postdoctoral Fellow from 2013-2016 at CSIRO in Australia. She will establish a world-class independent research team that will specialize in computational/theoretical research for defining the atomic bases of disease and developing novel therapeutics, based on her strong training in computational biology, bioinformatics and molecular modelling, as well as her strong publication record and demonstrated teaching skills.

New Definite Term – Full-Time

GANESAN, Aravindhhan, Research Assistant Professor, School of Pharmacy, October 1, 2019 to September 30, 2022. [M.Sc., Annamalai University (2007); Ph.D., Swinburne University of Technology (2012).] Dr. Ganesan received his Ph.D. in computational chemistry from Swinburne University of Technology in Melbourne, Australia followed by postdoctoral training related to molecular modelling and computational biology. He is completing a postdoctoral fellowship in the Faculty of Pharmacy and Pharmaceutical Science, University of Alberta where he works on the development of small molecular inhibitors of immune checkpoint targets to improve the effectiveness of cancer immunotherapy. His training and research interests fit well with other researchers at the School of Pharmacy who are interested in molecular modelling and drug development.

LEE, Brenda Yasia, Lecturer, Department of Physics and Astronomy, September 1, 2019 to August 31, 2022. [B.Sc., University of Waterloo (2012); Ph.D., University of Waterloo (2017).] Dr. Lee received her Ph.D. in Biophysics and Nanotechnology from the University of Waterloo. Dr. Lee worked with Dr. Zoya Leonenko using atomic force microscopy to study amyloid-beta interactions with SG1 inhibitors. She has taught in the Department of Physics and Astronomy for several years, having distinguished herself as an outstanding and caring teacher. We are excited to welcome her to the faculty.

Adjunct Appointments

Undergraduate Instruction

McCOY, Tracy, Clinical Assistant Professor, School of Pharmacy, April 1, 2019 to December 31, 2019.

YRIGOYEN-DACRUZ, Lidia, Clinical Assistant Professor, School of Pharmacy, April 1, 2019 to December 31, 2019.

Graduate Supervision and Research

SMITH, Matthew, Associate Professor, Department of Biology, March 1, 2019 to February 28, 2022.

Adjunct Reappointments

Undergraduate Instruction, Graduate Instruction and Research

TSUYUKI, Ross, Professor, School of Pharmacy, May 1, 2019 to April 30, 2022.

LEGGETT, Anthony, Professor, Department of Physics and Astronomy, February 1, 2017 to January 31, 2020.

XIAO, Wenjiao., Professor, Department of Earth and Environmental Sciences, November 1, 2017 to October 31, 2020.

Changes in Appointment

JOHNSTON, John W., Department of Earth and Environmental Sciences, appointment changed from Definite-term Assistant Professor to Continuing Lecturer, effective July 1, 2019.

MacIVER, Sarah, Clinical Assistant Professor, second probationary period extended one year. New end date June 30, 2022.

Correction

GALITSKI, Victor, Professor, Department of Physics and Astronomy, will not be taking up his position.

B. ADMINISTRATIVE REAPPOINTMENT

STANBERRY, Andre, Clinic Director, School of Optometry and Vision Science, May 1, 2019 to April 30, 2022.

WAITE, Nancy, Associate Director, Clinical Education, School of Pharmacy, March 1, 2019 to February 28, 2022.

FOR APPROVAL BY THE BOARD OF GOVERNORS

C. *SABBATICAL LEAVE*

AFSHORDI, Niayesh, Associate Professor, Department of Physics and Astronomy, September 1, 2019 to August 31, 2020, 100% salary arrangement.

MAXWELL, Colleen J., Professor, School of Pharmacy, September 1, 2019 to August 31, 2020, 100% salary arrangement.

A handwritten signature in black ink, appearing to read 'R.P. Lemieux', with a long horizontal flourish extending to the right.

R.P. Lemieux
Dean

University of Waterloo
SENATE
21 May 2019

FOR APPROVAL

Committee and Appointments

Motion: To approve the following appointment:

- **Council of Ontario Universities Academic Colleague:** Johanna Wandel (geography & environmental management) as COU Academic Colleague, term 1 July 2019 to 30 June 2022.

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

Senate Graduate & Research Council met on 8 April 2019 and agreed to forward the following item to Senate for approval as part of the regular agenda.

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

FOR APPROVAL

DISSOLUTION OF RESEARCH CENTRE

Centre for Applied Cryptographic Research

1. **Motion:** To approve the dissolution of the Centre for Applied Cryptographic Research (CACR) in 2019, as presented in Attachment 1.

Rationale: After consultation by CACR director (David Jao) with members of CACR and the Combinatorics and Optimization department chair, a consensus has emerged to dissolve CACR and incorporate its activities into the Cybersecurity and Privacy Institute (CPI), launched in 2018. The CPI has a broader mandate than CACR while still including the activities of CACR within its scope.

NEW PROGRAM

Faculty of Science

2. **Motion:** To approve a new Master of Pharmacy (MPharm) in Advanced Pharmacy Practice to be offered by the School of Pharmacy, effective 1 September 2019, as presented in Attachment #2.

Rationale: Undergraduate pharmacy education in Ontario and elsewhere in Canada is designed to train a pharmacist who is able to serve the medication and health requirements of patients with a broad range of medical conditions. However, there is a need for an advanced pharmacist practitioner who has the expert knowledge to manage complex patients or complex drug therapy in specialized patient populations. These advanced practitioners require a higher level of knowledge and skill in order to make the best possible decisions regarding medication management based on clinical judgement, critical appraisal of evidence and treatment goals.

The traditional training path for the development of advanced-level practitioners and clinical scientists in pharmacy was the post-baccalaureate Doctor of Pharmacy (PharmD) program. As pharmacy education evolved in North America, a modified version of the original PharmD has become the entry-to-practice degree for pharmacists and post-baccalaureate PharmD programs have been discontinued. The combined effect of the discontinuation of post-baccalaureate PharmD programs and the lack of residency training opportunities in Canada is that there is a shortage of pharmacists with the advanced clinical and research skills needed to meet the needs of health care institutions and universities for clinical practitioners, educators and scientists. The proposed Master of Pharmacy program is designed to address this need.

PROGRAM CHANGE

Faculty of Arts

- 3. Motion:** To approve the removal of formal graduate research fields within the Master of Arts (MA) in Political Science and Mater of Arts (MA) in Political Science – co-operative program, effective 1 September 2019, as presented in Attachment #3.

Rationale: Although the department of political science has research strength in the areas of Canadian Politics, Conflict and Conflict Resolution, and Political Economy, these fields do not reflect the varied research projects that faculty can supervise. Additionally, eliminating formal fields may expand the applicant pool; as currently, there is risk of losing applicants whose interests fall outside the three research fields. Instead, a comprehensive list of project/research areas that faculty can supervise/support will be included on the department's website. Finally, having three formal research fields does not align with the department's delivery of programs, including course offerings.

Faculty of Engineering

- 4. Motion:** As presented in Attachment #4, to approve, within the MEng in Electrical and Computer Engineering Program, the addition of Graduate Specializations, in place of the currently offered graduate diplomas: (1) Graduate Diploma (GDip) in Computer Networking and Security and (2) Graduate Diploma (GDip) in Sustainable Energy. Specializations to be added:

- computer networking and security, as well as sustainable energy, effective 1 September 2019
- nanoelectronic circuits and systems, as well as artificial intelligence and machine learning, effective 1 January 2020.

Rationale: The change from Graduate Diplomas to Graduate Specializations is to better reflect the nature of the course packaging and also to bring the credentialization of focused course selection into line with Faculty of Engineering objectives. Consequently, ECE will be discontinuing the existing Graduate Diplomas offered with the MEng. In their place, Graduate Specializations have been proposed.

Faculty of Science

- 5. Motion:** To approve the revision to the Fields of Study for the PhD and MSc in Earth Sciences programs, effective 1 May 2019, as presented in Attachment #5.

Rationale: Fields of study have been updated to better reflect interests of faculty and changes to field names.

GRADUATE STUDIES ACADEMIC CALENDAR CHANGES

- 6. Motion:** To approve Graduate Studies Academic Calendar changes pertaining to graduate student progress, effective 1 May 2019, as presented in Attachment #6.

Rationale: Guidelines for evaluating and providing feedback on graduate student progress in PhD and research Masters programs and coursework programs have been developed to provide better clarity of expectations for students and faculty.

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

Charmaine Dean
Vice President, Research & International

MEMORANDUM

TO: Senate Graduate and Research Council

CC: Kathy Winter
Secretariat

David Jao
Director, Centre for Applied Cryptographic Research

Bernard Duncker
Associate Vice-President, Interdisciplinary Research

FROM: Charmaine B. Dean
Vice-President, Research and International 

DATE: Monday March 25, 2019

RE: Support for the Dissolution of the Centre for Applied Cryptographic Research

The attached documentation was received on 15 March 2019 from David Jao, Director of the Centre for Applied Cryptographic Research recommending that the Centre be dissolved in 2019. This memo is to advise that Research Leaders Council supports the recommendation that the Centre be dissolved.



Prof. Stephen Watt
Dean of Mathematics

March 15, 2019

Research Leaders Council
Office of Research


To whom it may concern,

To my knowledge, the Centre for Applied Cryptographic Research has operated formally since 1998 as a joint working group of faculty members, students, and industry collaborators for the purpose of advancing and fostering state of the art research in cryptography and computer security at Waterloo. Prior to 1998, the CACR operated informally as the Data Encryption Group (DEG) in the Department of Combinatorics and Optimization at Waterloo, founded in 1983 by Professors Vanstone, Mullin, and Agnew. The CACR has helped to sponsor the Institute for Quantum Computing (established 2002), the Cybersecurity and Privacy Institute (established 2018), and numerous international research conferences and workshops held at Waterloo (ECC 1998, ECC 1999, SAC 2000, ECC 2001, ECC 2003, SAC 2004, SAC 2010, PETS 2011, ESSPRITS 2011, SAC 2014, PQCrypto 2014, SAC 2019).

After consultation by the CACR director with members of the CACR and the C&O department chair, I understand that a consensus has emerged to dissolve the CACR and incorporate its activities into the Cybersecurity and Privacy Institute (CPI), launched in 2018. The CPI has a broader mandate than the CACR while still including the activities of the CACR within its scope. We believe that the research activities, seminars, technical reports, and workshops administered by the CACR can benefit from the extra administrative resources and topic coverage afforded by the larger organization. Many members of the CACR, including the CACR director, were directly involved in the founding of the CPI, and the CPI was launched and conceived with precisely the intent to take over the research agenda of the CACR while adding a broader base of support with the involvement of Engineering, Arts, and the provost's office.

Accordingly, I hereby support dissolution of the CACR and incorporation of its activities into the CPI.

Yours truly,


Kevin Hare for · Stephen Watt
(Acting Dean)

Rationale for dissolution:

- The CACR was founded by C&O and remains largely under the control of C&O and Math.
- The areas of research focus encompassed by the CACR include cryptography, security, privacy, and quantum computing.
- Although the CACR has been successful in fostering interdisciplinary collaborations and incubating commercial spinoffs, the C&O department is no longer the most natural home department for hosting such activities.
- The Cybersecurity and Privacy Institute (CPI) was launched in September 2018 as a university-level institute for the purpose of supporting an expanded scope of research collaborations and commercial partnerships. For example, the CPI's topic coverage includes sociological and policy aspects of privacy.
- The CPI is administered jointly by Math, Engineering, Arts, and AHS, with support from VP Research.
- From its inception, the CPI was intended to take over the CACR's role in research, development, and collaboration, with expanded topic coverage and university resources and support.

Outstanding issues:

- The CACR administers a mailing list which is used for centre activities. In recent years the mailing list has served primarily to distribute announcements of seminars and announcements of visits from external researchers, commercial partners, and industry representatives. The mailing list remains a useful resource for connecting with members of the cryptography research community at Waterloo. It should be maintained and administered by the CPI.
- The CACR web site contains some (soon to be historical) information about the CACR and its membership, as well as published technical reports from past years. The URLs for the technical reports need to be maintained indefinitely because there exists published literature that references these URLs in citations. Web redirects are acceptable for this purpose, but the redirects must function correctly and lead to the correct content. The remaining content from the web site should be migrated to the CPI's web site as appropriate.



David Jao
Director, CACR
April 6, 2019



February 4, 2019

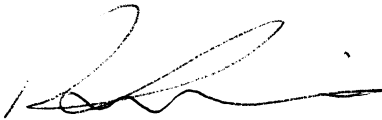
Dr. James Rush
Vice-President Academic & Provost
University of Waterloo

Re: Review of proposed Master in Pharmacy (MPHARM) in Advanced Pharmacy Practice

Dear Jim:

I write to provide my endorsement of the response to the reviewers' report of their recent review of the proposed Master in Pharmacy (MPHARM) in Advanced Pharmacy Practice program to be offered by the School of Pharmacy in the Faculty of Science. The report is very favorable and provides useful recommendations for the School to move forward and implement this new program.

Sincerely,



Robert P. Lemieux
Dean of Science



UNIVERSITY OF WATERLOO

**GRADUATE PROGRAM PROPOSAL
OF**

**MASTER OF PHARMACY
IN
ADVANCED PHARMACY PRACTICE**

**Submitted to the
Ontario Universities Council on Quality Assurance**

VOLUME I - PROPOSED BRIEF

JANUARY 2019

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1. INTRODUCTION: Learning Objectives and Outcomes

Undergraduate pharmacy education in Ontario and elsewhere in Canada is designed to train a pharmacist who is able to serve the medication and health requirements of patients with a broad range of medical conditions. However, there is a need for an advanced pharmacist practitioner who has the expert knowledge to manage complex patients or complex drug therapy in specialized patient populations. These advanced practitioners require a higher level of knowledge and skill in order to make the best possible decisions regarding medication management based on clinical judgement, critical appraisal of evidence and treatment goals.

The traditional training path for the development of advanced-level practitioners and clinical scientists in pharmacy was the post-baccalaureate Doctor of Pharmacy (PharmD) program. The majority of academic and clinical pharmacists working in Canada completed post-baccalaureate PharmD training at University of Toronto, University of British Columbia or universities in the United States. As pharmacy education evolved in North America, a modified version of the original PharmD has become the entry-to-practice degree for pharmacists and post-baccalaureate PharmD programs have been discontinued. In the United States, pharmacists who are interested in advanced clinical training can complete a two year post-graduate pharmacy residency with the second year focused in specialized areas such as cardiovascular disease, infectious diseases, critical care medicine or ambulatory care. In Canada, pharmacy residencies are limited to a small number of one year programs and specialized residency training is lacking. Pharmacy residency programs are typically hospital-based and funded, do not include formal coursework and research training is limited. The combined effect of the discontinuation of post-baccalaureate PharmD programs and the lack of residency training opportunities in Canada is that there is a shortage of pharmacists with the advanced clinical and research skills needed to meet the needs of health care institutions and universities for clinical practitioners, educators and scientists. The proposed Master of Pharmacy program is designed to address this need.

1.1 Brief Listing of the Program

The Master of Pharmacy program is an advanced professional graduate-level program that includes a Master's research paper and will train advanced pharmacist practitioners for careers in clinical practice, education and clinical research. The program includes required and elective courses, a clinical practicum and completion of a non-thesis research project. The program may be completed full-time or part-time but initially students will only be admitted for full-time study and will be expected to complete the requirements in six semesters. The program will predominantly be delivered in-person with an emphasis on problem-based learning as a pedagogical model in the required courses. The clinical practicum will take place in a variety of health care settings including primary care and institutional sites and will not use the co-op model. The students will pay fees consistent with those charged for other professional pharmacy programs in Canada.

1.2 Method Used for Preparation of the Brief

The development of a graduate program to meet the need for advanced pharmacist practitioners has been under discussion within the School of Pharmacy for several years. This was stated in the School's Strategic Plan (<https://uwaterloo.ca/pharmacy/about-school-pharmacy/school-pharmacy-strategic-plan-2014-2018>), approved in 2014, under Strategic Priority 1: "Establish additional opportunities for graduate training in clinical and applied medication and health-related research." The graduate programs in the School of Pharmacy (thesis-based MSc and PhD) were reviewed in November 2016 and one of the primary recommendations of the external reviewers was that "the School should focus on developing (or offering on a more regular basis) additional graduate courses especially in the clinical and pharmacy practice areas."

A working group of pharmacy educators and practitioners from across Canada has created a "Proposed National Framework for Advanced Practice Pharmacy Education in Canada". A number of career roles have been identified for advanced practitioners including clinical leader, clinical educator and clinical scientist and the suggested educational pathway for all of these careers includes completion of a "clinical MSc" degree. However, there are currently no such professional Masters programs offered at Canadian universities outside of Quebec. The demand for advanced clinical pharmacy training is clear given that pharmacy residency programs may receive 80-100 applications for a single position. In the current environment, unsuccessful residency candidates have no other options for pursuing advanced clinical education. The transition of the undergraduate pharmacy program from a BScPharm degree to the entry-level PharmD degree coupled with the successful recruitment of a suitable cohort of faculty members with clinical expertise has positioned the University of Waterloo to move forward with the development of a clinical Master's program at this time.

A faculty workshop was held at the School of Pharmacy on June 27, 2017 to discuss clinical graduate programs. At that time, it was decided that a clinical Master's program should be developed and that the curriculum should include advanced coursework relevant to medication management, a clinical practicum and a clinical or applied research project. A working group was formed to further develop the curriculum for the Master of Pharmacy program and consisted of the Hallman Director, the Associate Director, Research and Graduate Studies and 3 faculty members with clinical training and experience to further develop the curriculum for the program. The working group met on several occasions between July and November and the recommendations of this group were brought forward for discussion at a second faculty retreat on November 15, 2017.

The program proposal brief was developed based on the discussions of the working group, input from the faculty at the workshops as well as comments from external stakeholders. This included discussions with regional clinical coordinators affiliated with the School of Pharmacy as well as leaders in hospital pharmacy (Professional Practice Conference, Canadian Society of Hospital Pharmacists) and academic pharmacy (Council of Deans, Association of Faculties of Pharmacy of Canada) including the Leslie Dan Faculty of Pharmacy, University of Toronto. University of Waterloo and University of Toronto are the only universities in Ontario which offer pharmacy education in Ontario and University of

Toronto is developing a similar Masters-level graduate program for advanced pharmacist practitioners. The discussions between the universities primarily focused on collaboration in teaching in order to take advantage of the different strengths in clinical education and research that each university has.

Volume I was presented to School of Pharmacy Council on January 25, 2018 and approved. Faculty were asked to submit their vitae (Volume II) and a list of potential external reviewers (Volume III) was developed by the working group and vetted at a faculty meeting in April 2018. The full proposal (Volumes I, II and III) along with the Graduate Studies New Program Template was approved at School of Pharmacy Council on May 24, 2018.

1.3 Objectives of the Program

The mission of the School of Pharmacy, as articulated in the strategic plan is to serve as a catalyst for improved medication use and development through experience-based education, discovery and engagement. Faculty and staff at the School are also committed to achieving the vision of leading “transformative change in the development and use of medications for the improvement of human health.” The Strategic Mandate Agreement between the University of Waterloo and the province lists a number of key areas of differentiation for the university including “health and well-being”. The proposed Master of Pharmacy program is consistent with the goal of advancing the health and well-being of Ontario residents.

The objective of the Master of Pharmacy program is to develop advanced pharmacist practitioners who will serve as medication experts in the provision of health care, educators in the classroom and clinical setting, and researchers contributing to the generation and transfer of knowledge related to the optimal use of medications. The name of the degree, Master of Pharmacy (MPharm), distinguishes this training from the MSc degree offered by the School of Pharmacy which is research-focused and primarily prepares graduates for further academic study or entry-level positions in the pharmaceutical industry. In addition, the terminology Master of Pharmacy implies that the individual who has earned this degree has the clinical practice skills as well as the research and educational training to serve as an advanced pharmacist practitioner and medication therapy expert.

The program requirements for the Master in Pharmacy program are outlined in detail in section 1.6 and in section 4 (Curriculum). The program learning outcomes are listed below:

1. Demonstrate the ability to integrate and apply knowledge from a broad range of pharmaceutical, pharmacy and biomedical disciplines including, but not limited to, pharmaceutics, pharmacology, pharmacokinetics, therapeutics, pharmacogenetics, pharmacoepidemiology, pharmacoconomics and pathophysiology to identify and manage the medication needs of a diverse patient population.
2. Utilize problem-solving and decision making skills to develop and implement a comprehensive pharmaceutical care plan for individual patients in collaboration with patients and other

Proposed Program – Master of Pharmacy (Advanced Pharmacy Practice)

- health care providers using principles of evidence-based practice.
3. Identify and critically analyze biomedical literature relevant to the care of patients or the development of a research proposal.
 4. Understand the strengths and limitations of a diverse range of research methods that are used in clinical, translational and applied research.
 5. Demonstrate the ability to develop a research hypothesis to address a clinically important problem and design an appropriate protocol to test the hypothesis.
 6. Conduct a research project, analyze data using appropriate statistical methods to draw valid conclusions and prepare a publication-ready manuscript based on the results.
 7. Effectively communicate drug and health information as well as care plans to patients, health care providers, policy makers and the lay public using appropriate verbal and written communication skills.
 8. Understand and use current best practices in pedagogy for educating patients, health professional students and practitioners in the classroom and clinical settings.
 9. Demonstrate leadership as well as professional and ethical behaviours and attitudes in clinical practice, teaching, and the conduct of research.
 10. Be committed to life-long learning understanding that best practices in research, education and patient care evolve as a result of the discovery, synthesis and integration of new evidence.

These learning outcomes have been mapped to the Master’s Degree Level Expectations at the University of Waterloo and are presented in the following table:

Master’s Degree-level Expectations	MPharm Learning Outcome
<p>1. Depth and Breadth of Knowledge – A systematic understanding of knowledge including, where appropriate, relevant knowledge outside the field and/or discipline, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study or area of professional practice.</p>	<ol style="list-style-type: none"> 1. Demonstrate the ability to integrate and apply knowledge from a broad range of pharmaceutical, pharmacy and biomedical disciplines including, but not limited to, pharmaceutics, pharmacology, pharmacokinetics, therapeutics, pharmacogenetics, pharmacoepidemiology, pharmacoeconomics and pathophysiology to identify and manage the medication needs of a diverse patient population. 2. Utilize problem-solving and decision making skills to develop and implement a comprehensive pharmaceutical care plan for individual patients in collaboration with patients and other health care providers using principles of evidence-based practice.
<p>2. Research and Scholarship – A conceptual understanding and methodological competence that:</p> <ol style="list-style-type: none"> a) Enables a working comprehension of how established techniques of research and inquiry are used to create and interpret knowledge in the discipline; b) Enables a critical evaluation of current research and advanced research and scholarship in the discipline or area of professional competence; c) Enables a treatment of complex issues and judgments based on established principles and techniques; and, <p>On the basis of that competence, has shown at least one of the following:</p> <ol style="list-style-type: none"> a) The development and support of a sustained argument in written form; or b) Originality in the application of knowledge. 	<ol style="list-style-type: none"> 3. Identify and critically analyze biomedical literature relevant to the care of patients or the development of a research proposal. 4. Understand the strengths and limitations of a diverse range of research methods that are used in clinical, translational and applied research. 5. Demonstrate the ability to develop a research hypothesis to address a clinically important problem and design an appropriate research protocol to test the hypothesis. 6. Conduct a research project, analyze data using appropriate statistical methods to draw valid conclusions and prepare a publication-ready manuscript based on the results.

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<p>3. Level of Application of Knowledge - Competence in the research process by applying an existing body of knowledge into the critical analysis of a new question or of a specific problem or issue in a new setting.</p>	<p>5. Demonstrate the ability to develop a research hypothesis to address a clinically important problem and design an appropriate research protocol to test the hypothesis.</p> <p>6. Conduct a research project, analyze data using appropriate statistical methods to draw valid conclusions and prepare a publication-ready manuscript based on the results.</p>
<p>4. Professional Capacity/Autonomy – The qualities and transferable skills necessary for employment requiring:</p> <p>a) The exercise of initiative and of personal responsibility and accountability;</p> <p>b) Decision-making in complex situations;</p> <p>c) The intellectual independence required for continuing professional development;</p> <p>d) The ethical behavior consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research; and</p> <p>e) The ability to appreciate the broader implications of applying knowledge to particular contexts.</p>	<p>2. Utilize problem-solving and decision making skills to develop and implement a comprehensive pharmaceutical care plan for individual patients in collaboration with patients and other health care providers using principles of evidence-based practice.</p> <p>9. Demonstrate leadership as well as professional and ethical behaviours and attitudes in clinical practice, teaching, and the conduct of research.</p> <p>10. Be committed to life-long learning understanding that best practices in research, education and patient care evolve as a result of the discovery, synthesis and integration of new evidence.</p>
<p>5. Level of Communication Skills - The ability to communicate ideas, issues and conclusions clearly.</p>	<p>6. Conduct a research project, analyze data using appropriate statistical methods to draw valid conclusions and prepare a publication-ready manuscript based on the results.</p> <p>7. Effectively communicate drug and health information as well as care plans to patients, health care providers, policy makers and the lay public using appropriate verbal and written communication skills.</p> <p>8. Understand and use current best practices in pedagogy for educating patients, health professional students and practitioners in the classroom and clinical settings.</p>
<p>6. Awareness of Limits of Knowledge - Cognizance of the complexity of knowledge and of the potential contributions of other interpretations, methods, and disciplines.</p>	<p>5. Demonstrate the ability to develop a research hypothesis and design an appropriate research protocol to address a clinically-related question.</p> <p>10. Be committed to life-long learning understanding that best practices in research, education and patient care evolve as a result of the discovery, synthesis and integration of new evidence.</p>

1.4 Admission Requirements

Applicants must have graduated from an accredited undergraduate pharmacy program leading to the BScPharm or PharmD degrees **and** be licensed or eligible for licensure as a pharmacist in Ontario. Prospective students will be considered for admission to the MPharm program if they have a minimum average of 78% in the final two years of their undergraduate pharmacy degree (same standard as the MSc and PhD programs in the School of Pharmacy). Applicants must also have outstanding verbal and written communication skills in English (assessed by personal interview) since these are essential to the achievement of a number of the programmatic learning outcomes.

Students who are not licensed at the time of acceptance into the MPharm program will be required to obtain licensure prior to beginning the clinical practicum since they will be expected to engage in the full range of professional activities associated with the scope of practice for pharmacists in Ontario. It is highly desirable and preferred that applicants have completed at least one year of pharmacy practice or an accredited pharmacy residency program prior to entering the MPharm program. It is recognized that practice experience allows health care professionals to build additional knowledge and clinical skills beyond those acquired during their undergraduate education and will assist students entering the MPharm program in developing a plan of work that is appropriate to future career goals. An MPharm Admissions Committee will be struck and charged with evaluating applicants and making final decisions regarding admission to the program.

1.5 a) Structure

The major components of the program will be:

- i) Foundational didactic coursework (e.g., advanced therapeutics, pharmacokinetics, pharmacogenomics, critical appraisal, research methods, statistics, physical assessment, pharmacoepidemiology, pharmacoeconomics).
- ii) Clinical practicum in family health teams, hospitals, long-term care facilities and other health care settings tailored to the experience and interests of the student as well as the expertise of the faculty (a minimum of 750 hours are required).
- iii) Research project addressing an important clinical or practice issue.

A more detailed description of the curriculum is provided in Section 1.6 and Section 4.

b) Effect of Structure on Quality

The MPharm program includes extensive coursework, experiential education in the clinical setting and the completion of a clinical or applied research project from beginning to end. All of these elements are essential to the development of an advanced pharmacist practitioner. Full-time students will complete the program in 24 months (6 terms) with approximately equal amounts of time devoted to coursework, advanced clinical training and research. It is expected that a part-time option will be developed at a later date in which students will take 1-2 courses per term and complete the program in 4 years.

It is recognized that the level of research training in this program is not sufficient to develop all of the skills required for a clinical scientist. The MPharm program will provide students with a strong understanding of the strengths and limitations of a wide range of quantitative and qualitative methods used in clinical research while further developing the skills required for critical appraisal of the drug literature. However, the length and depth of research training is less than what students would receive in a thesis-based MSc or PhD program. Students who are primarily interested in a research-focused career may wish to consider enrolling in a thesis-based graduate program following completion of the MPharm degree.

1.6 Program Content

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Medications remain the cornerstone of therapy for the prevention, management and treatment of many diseases. While pharmacists with entry-level training are able to effectively manage the medication needs of patients with a broad range of medical conditions, advanced practitioners are needed for complex patients or specialized patient populations with complex medication regimens. As described earlier, the elimination of post-baccalaureate PharmD programs combined with a lack of pharmacy residencies in Canada has left no clear pathway for pharmacists who wish to obtain advanced clinical training to assume leadership roles in health care or academia. The MPharm program will address this need by providing students with coursework, clinical experience and research training in order to develop an advanced pharmacist practitioner and medication therapy expert.

The program requirements include:

Coursework – Students must complete 6 required courses and a minimum of 2 electives. The required courses will include:

PHARM 651: Advanced Principles of Medication Management 1 – Students will learn advanced principles of drug action, pharmacodynamics, pharmacogenomics, pharmacokinetics and pharmacotherapeutics and will apply these principles to identifying and resolving drug-related problems in a variety of therapeutic areas. A problem-based learning approach will be used to maximize student learning.

PHARM 652: Advanced Principles of Medication Management 2 – This course further expands the skills and knowledge developed by students in Advanced Principles of Medication Management 1.

PHARM 653: Methods in Clinical and Applied Research - This course will provide an overview of common research methods used to address questions in clinical and translational research. Research ethics and responsible conduct of research will be addressed. The course will also cover basic concepts in successful grant writing.

PHARM 654: Critical Appraisal and Evidence-based Practice – Using a journal club format, students will identify and analyze papers from the primary literature. Skills related to critical appraisal and evidence-based practice will be developed. Students will also have the opportunity to develop communication skills related to presenting scientific literature.

PHARM 655: Physical Assessment and Clinical Laboratory Testing – Fundamental skills of physical assessment and the basic understanding and interpretation of diagnostic testing, imaging and clinical laboratory tests relevant to monitoring the effects and adverse events associated with the use of medications will be covered (lecture and laboratory).

Biostatistics Requirement – Students must complete an approved course in biostatistics or quantitative data analysis offered in the School of Pharmacy or other departments at the University of Waterloo.

Students will complete a minimum of 2 electives selected on the basis of their individual career goals. Suggested courses may include but are not limited to special topics in

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primary care, pharmacoepidemiology, pharmacoconomics, systematic reviews, digital design, advanced statistics, computer science, leadership and management. Students will be encouraged to choose elective courses that are relevant to their anticipated career goals. Full-time students must complete the required courses prior to beginning the clinical practicum. Elective courses may be completed later in the program.

Milestones - In addition to completion of the course requirements, students must complete the following milestones, in order to meet programmatic learning outcomes related to advanced clinical practice, teaching excellence, , and research:

1. Graduate Studies Practicum – The further development of clinical skills related to patient care is an important programmatic outcome. Students in the MPharm program must complete a minimum of 750 hours of clinical experiences involving direct patient care in one or more health care settings (hospital, primary care, long-term care, community practice). Students will be able to tailor their clinical experiences in order to meet their future practice goals. The practicum will be supervised by a faculty member in the School of Pharmacy or a designated clinical supervisor affiliated with the School of Pharmacy. Clinical supervisors will complete a detailed rubric assessing student progress in a number of areas. Students will normally begin the clinical practicum during the third term
2. Master’s Research Paper – Research projects will address an important problem related to an area of medication use or clinical practice. Students must write a protocol and conduct all aspects of the research including obtaining ethics approval, recruitment of participants, data collection, data analysis and preparation of a manuscript. Students will complete their research to the satisfaction of the advisory committee.
3. Teaching Competency – Students are expected to complete “Fundamentals of University Teaching” offered by the Centre for Teaching Excellence at the University of Waterloo. This program involves 6 teaching workshops and the delivery of three micro-lessons to peers. In addition, MPharm students will have opportunities to provide lectures and serve as tutors or teaching assistants in the undergraduate PharmD program. This requirement addresses in part the program outcomes related to the development of teaching skills given that MPharm graduates are likely to accept employment that involves education of patients, students, health care providers and the public regarding appropriate use of medications.
4. Completion of the Faculty of Science “Academic Integrity Workshop”.
5. Participation in workshops associated with the “Student Leadership Program” offered by the Student Success Office at UW. This program includes workshops focused on communication, leadership styles and conflict management. These workshops will provide students with skills relevant to both clinical practice and professional leadership. With the approval of the program director, students may also fulfill this requirement by completing another suitable leadership program.

1.7 Mode of Delivery

The curriculum for the MPharm program will use a variety of different methods to deliver the material required to achieve the learning objectives of the program. Students will complete 8 courses including 6 required core courses and 2 electives. Many of the

Proposed Program – Master of Pharmacy (Advanced Pharmacy Practice)

electives are pre-existing at the University of Waterloo in the School of Pharmacy or the Faculty of Applied Health Sciences. The required courses will be developed by the faculty in the School of Pharmacy with the exception of the biostatistics requirement for which students may elect a pre-existing course at the University of Waterloo.

The core pharmacy courses designed to build foundational knowledge in therapeutics and medication management will make extensive use of active learning techniques such as problem-based learning (PBL). This approach, pioneered by the School of Medicine at McMaster University and used in the undergraduate pharmacy program at Waterloo, is a student-centred active learning strategy that will allow this small cohort of highly motivated students to develop critical thinking skills applicable to managing a wide range of clinical drug-related problems. Online delivery is not expected to be a primary model of education for the required courses although the learning management platform LEARN will be used to support all courses in the program.

Interdisciplinary learning and collaboration is essential in order for students to meet the expected learning outcomes and the program will provide a number of opportunities for students to learn and work with members of other health care professions. The School of Pharmacy is closely linked to both the McMaster University Michael G. DeGroot School of Medicine (Waterloo campus) and the McMaster KW and Area Family Medicine Residency program, both of which are based at the Health Sciences campus. Currently a number of faculty members in the School of Pharmacy participate in the evidence-based medicine curriculum for the Family Practice residents. It is anticipated that PHARM 654: Critical Appraisal and Evidence-Based Practice could be offered in a way that would allow MPharm students and family practice medical residents to learn together and develop interprofessional collaboration skills. Physicians and family medicine residents affiliated with McMaster and the Centre for Family Medicine Academic Family Health Team could also make valuable contributions to PHARM 655: Physical Assessment and Clinical Laboratory Testing.

The development of clinical skills for the advanced pharmacy practitioner will be achieved through experiential learning during the practicum. Students will complete 750 hours in clinical practice with an appropriate clinical supervisor (faculty member or affiliated faculty). The clinical practicum is expected to provide students with additional opportunities for interdisciplinary learning and practice. Students will provide patient care working in collaboration with physicians, nurses and other health care providers and this will be assessed as an outcome for the practicum. The practicum will be designed with maximum flexibility given that individual students will enroll with different levels of practice experience and potentially specific areas of interest with respect to their future area of pharmacy practice. A number of faculty members at the School of Pharmacy actively practice in family health teams or other primary care settings that will be ideal sites for the clinical practicum. The opportunity for students to focus their clinical training in the primary care setting (eg. family health teams) will be a distinguishing feature and a focus of the program particularly during the early years of the program. It is noted, however, that the School of Pharmacy has affiliations with clinical sites and practitioners in teaching hospitals, community hospitals, long-term care facilities and other health care

environments throughout Ontario that can also serve as outstanding sites for clinical education.

The program outcomes related to clinical research skills will be met through a combination of didactic coursework (research methods, statistics) as well as completion of a research project. Students will work with their faculty supervisor who will be primarily responsible for ensuring that the learning outcomes associated with the research project are achieved. Students will be expected to address an important clinical or practice issue with their project. Although there are basic scientific principles that apply to all types of research, a key learning outcome is that students will understand the unique challenges associated with clinical and applied research.

1.8 Assessment of Teaching and Learning

The MPharm program is a course-based graduate degree and a variety of assessment methods will be used to ensure that programmatic learning outcomes have been achieved. Required and elective foundational courses, offered primarily in the first two terms of the program, will use traditional summative assessments (exams, assignments) to measure student progress. Numerical grades will be assigned based on usual University of Waterloo standards for graduate-level courses.

The clinical practicum will typically begin during the third term. The School of Pharmacy uses a detailed rubric to evaluate the performance of students in the clinical setting. This tool (Ontario Pharmacy Patient Care Assessment Tool – OPPCAT) was jointly developed by the University of Waterloo, University of Toronto, Ontario Pharmacy Residency Board and the Ontario College of Pharmacists and has the desired flexibility to evaluate the clinical performance of a wide range of learners including undergraduate students, pharmacy residents, international pharmacy graduates and graduate students. Individual elements for assessment will include knowledge base, patient care skills, clinical decision making, communication, professionalism, practice management and ability to work collaboratively with an interprofessional health care team. Students will receive formative assessments every 4 weeks during the practicum as well as a final summative assessment. The rubric will be completed by the designated clinical supervisor (faculty or affiliated faculty) who is expected to observe the performance of the student in the clinical environment.

Each student will be assigned a research supervisor and advisory committee who will be responsible for ensuring that learning outcomes related to the research project are met. Supervisors will normally hold regular faculty appointments in the School of Pharmacy and meet the expected qualifications for supervising graduate students. Full-time students will be expected to develop a research proposal by the end of the fourth term. The quality of the final research paper will be assessed by the supervisor and the advisory committee. Students will be required to make an oral presentation of their research project in order to complete degree requirements.

The University of Waterloo Master's degree-level expectations are outlined in section 1.3. "Depth and breadth of knowledge" will be assessed in all areas of the MPharm program

including courses such as Advanced Principles of Medication Management and will be a primary focus in the clinical practicum where students will be expected to identify drug-related problems and develop comprehensive pharmaceutical care plans for individual patients with potentially a wide range of medical issues. Students will meet expectations under “Research and scholarship” through successful completion of relevant coursework (Methods in Clinical and Translational Research; Critical Appraisal and Evidence-based Practice) and by completing a research project involving the development and execution of a protocol as well as an oral presentation and approval of a written report in manuscript-style. . The research project will also be the primary vehicle for assessing “Level of Application of Knowledge”. Students will have the opportunity to demonstrate their professional capacity and autonomy in the clinical practicum where they will be required to make decisions affecting the care of patients. Critical thinking skills are important in making clinical decisions that require interpretation of an array of complex information or assessment of incomplete information. The “level of communication skills” will be assessed throughout the MPharm program. During the clinical practicum, clinical supervisors will assess verbal interactions with patients and other health care providers as well as written communications such as documentation of patient care recommendations in the health record. Similarly, completion of the research project will require an oral defense as well as effective writing skills for developing a protocol as well as a written report. Both research and clinical practice require an “awareness of limits of knowledge” and this concept will be emphasized and evaluated in the clinical practicum and research project.

1.9 Fields in a Graduate Program [optional]

Not applicable.

2. HUMAN RESOURCES

2.1 a) List of Faculty by Field

Faculty members in the School of Pharmacy are listed in Table 1. The School currently has a total of 24 full-time faculty members. Faculty who are primarily engaged in clinical or applied education and research include 11 tenured or tenure-track faculty members (all of whom are able to supervise students at the Master’s level), 1 open tenure-track position and an additional 3 Clinical Lecturers who are engaged in clinical, applied or translational research. This represents one of the largest cohorts of clinical researchers in a pharmacy school in Canada. Active areas of research include but are not limited to:

- Anticoagulation
- Assessment of value and impact of clinical and professional pharmacy services
- Applied pharmacokinetics, drug interactions
- Diabetes
- Geriatric care, frailty and Alzheimer’s disease
- Health technology

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- Impact of pharmacists as immunizers, travel medicine
- Pharmacotherapy and pharmacoepidemiology of diabetes
- Pharmacoeconomics related to treatment of hepatitis C infection
- Primary care, rural health
- Oncology
- Opioid use and harm reduction
- Neurological diseases
- Nutrition
- Self-care and pharmacist prescribing for common ailments

The diversity of research areas within the School of Pharmacy will ensure that students enrolled in the MPharm program will have opportunities to pursue a wide range of clinical problems affecting patients in Canada.

The School of Pharmacy also has a strong core of basic scientists with active research programs in pathophysiology, pharmaceuticals, pharmacokinetics, medicinal chemistry and pharmacology (Table 1). These investigators maintain laboratories that are studying fundamental questions related to a diverse range of diseases and conditions including diabetes, cancer, HIV and Alzheimer's disease. Basic science faculty members are able to make important contributions to the MPharm program in didactic courses and in supporting research projects with a laboratory component as needed.

Students in the MPharm program will require the support of a number of services that are available at the University of Waterloo. Some of these services are identified below (also see section 3):

Centre for Teaching Excellence (CTE) - Program outcomes related to the development of teaching skills will be partially met by having students complete the Fundamentals of University Teaching program offered by the Centre for Teaching Excellence (CTE) at the University of Waterloo. The relatively small number of students enrolled in the MPharm program is not expected to require additional resources by CTE.

Other Services - Students in this program will utilize existing student support services available at the University of Waterloo as needed. These include the Accessibility Office, Student Success Centre, Graduate Studies and Post-Doctoral Affairs Office (academic advising) and health services including counselling available through Campus Wellness.

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TABLE 1

Faculty Members by Rank, Gender and Supervisory Privileges				
Faculty Name	Rank	Gender (M/F)	Home Unit ¹	Supervisory Privileges ²
Alsabbagh, Wasem	Assistant	M	Pharmacy	Masters
Chang, Feng	Associate	F	Pharmacy	Masters
Edwards, David	Professor	M	Pharmacy	Full
Grindrod, Kelly	Associate	F	Pharmacy	Full
Gamble, John-Michael	Associate	M	Pharmacy	Full
Houle, Sherilyn	Assistant	F	Pharmacy	Full
Maxwell, Colleen	Professor	F	Pharmacy	Full
Nagge, Jeff	Associate	M	Pharmacy	Masters
Patel, Tejal	Assistant	F	Pharmacy	Masters
Waite, Nancy	Professor	F	Pharmacy	Full
Wong, William	Assistant	M	Pharmacy	Full
Beazely, Mike	Associate	M	Pharmacy	Full
Blay, Jonathan	Professor	M	Pharmacy	Full
Edginton, Andrea	Associate	F	Pharmacy	Full
Foldvari, Marianna	Professor	F	Pharmacy	Full
Ho, Emmanuel	Associate	M	Pharmacy	Full
Joseph, Jamie	Associate	M	Pharmacy	Full
Nekkar, Praveen	Associate	M	Pharmacy	Full
Slavcev, Roderick	Associate	M	Pharmacy	Full
Wettig, Shawn	Associate	M	Pharmacy	Full
McFarlane, Tom	Clinical Lecturer	M	Pharmacy	Masters
Nakhla, Nardine	Clinical Lecturer	F	Pharmacy	Masters
Richard, Cynthia	Clinical Lecturer	F	Pharmacy	Masters
Barrett, Brett	Adjunct	F	Pharmacy	--
Coulston, Barbara	Adjunct	F	Pharmacy	--
Dhami, Rita	Adjunct	F	Pharmacy	--
Sian, Preet	Adjunct	F	Pharmacy	--

TABLE 2

Faculty Members by Fields and Expertise ¹						
Faculty Name	Pharmacy Practice	Pharmaceutical Sciences	Pharmacoeconomics	Pharmacoepidemiology	Informatics - Critical Appraisal	Clinical Area
Alsabbagh, Wasem	X		x	x		Cardiology, primary care
Chang, Feng	X					Opioid use, geriatrics
Edwards, David	x	X			x	Pharmacokinetics
Grindrod, Kelly	X			x	x	Primary care
Gamble, John-Michael	x			X	x	Diabetes
Houle, Sherilyn	X			x	x	Travel medicine, immunizations
Maxwell, Colleen				X	x	Geriatric care
Nagge, Jeff	X				x	Cardiology, primary care
Patel, Tejal	X					Geriatrics, neurology
Waite, Nancy	X					Immunizations
Wong, William			X		x	Liver disease, oncology
Beazely, Mike	x	X				Cardiology, substance abuse
Blay, Jonathan		X				Oncology, natural products
Edginton, Andrea		X				Pediatrics
Foldvari, Marianna		X				Glaucoma
Ho, Emmanuel		X				Infectious diseases (HIV), oncology
Joseph, Jamie		X				Diabetes
Nekkar, Praveen		X				Alzheimer's disease
Slavcev, Roderick		X				Vaccine development
Wettig, Shawn		X				Oncology
McFarlane, Tom	X					Oncology, primary care
Nakhla, Nardine	X					Self-care

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Richard, Cynthia	X					Nutrition
Barrett, Brett	X					Infectious diseases
Coulston, Barbara	X					Pain management, primary care
Dhami, Rita	X					Hospital Pharmacy Practice
Sian, Preet	X					Community pharmacy practice

1 A large X represents the faculty member's primary area of expertise while a small x represents a secondary area.

b) External Operating Research Funding

Not required for course-based Master's.

c) Graduate Supervision

Each student will be assigned a supervisor and advisory committee who will be responsible for ensuring that milestones and learning outcomes related to the research project are met.

d) Commitment of Faculty from Other Graduate Programs/Other Institutions

The School of Pharmacy is co-located on the Health Sciences campus with the Waterloo Regional campus of McMaster University's Michael G. DeGroote School of Medicine, the McMaster University Family Practice Residency program and the Centre for Family Medicine (CFFM) Academic Family Health team. The CFFM serves the primary care needs of over 30,000 patients in the Kitchener-Waterloo region. Several pharmacy faculty members are engaged in patient care, teaching and collaborative research with faculty at McMaster and the family health team. This relationship has enabled the development of a number of interprofessional education initiatives as well as the establishment of the only non-hospital based primary care pharmacy residency program in Canada. The Centre of Excellence for Innovation in Aging opened in late 2015 on the North campus of the University of Waterloo. The Centre includes a 192-bed long term care facility and is connected to the Research Institute for Aging building, dedicated to research and training. The Centre is home to a number of programs for education and applied research related to seniors care and is a resource for faculty members and graduate students from the School who are engaged in aging-related research.

The School of Pharmacy has developed an extensive network of affiliations throughout the province which will support the clinical practicum and research components of the curriculum. These include teaching hospitals (eg. London Health Sciences, Hamilton Health Sciences, Ottawa Hospital, Elizabeth Bruyere Hospital), community hospitals, family health teams, long term care facilities and community pharmacies throughout Ontario. Local sites include St. Mary's Hospital, Cambridge Memorial Hospital and Grand River Hospital (GRH). GRH is a supporting partner of the Waterloo primary care pharmacy residency program and the University of Waterloo signed a Memorandum of Understanding in 2015 with GRH to stimulate, support and facilitate teaching and research and creates dedicated research space within the hospital. Other partners include the Gateway Centre for Excellence in Rural Health (www.gatewayruralhealth.ca) based in Seaforth, Ontario and the South Western Ontario Academic Health Network (SWAHN). The mission of SWAHN (www.swahn.ca) is to "improve the health of the southwestern Ontario population

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and be a national leader in health care, education and research”. All major universities (including the Schulich School of Medicine and Dentistry at Western), colleges and hospitals in southwestern Ontario are partners in SWAHN. Finally, the School of Pharmacy has a Memorandum of Understanding with the Northern Ontario School of Medicine (NOSM) which facilitates access to research and teaching institutions in the north.

2.2 Quality of Faculty

Although the first students were only admitted in 2008, the School of Pharmacy at the University of Waterloo has rapidly built a reputation for the quality of its teaching and research programs. Members of the faculty have received numerous teaching awards within the University of Waterloo (e.g. three recipients of the Excellence in Science Teaching Award). Nationally, faculty and staff have been recognized through the Association of Faculties of Pharmacy of Canada (AFPC) with the AFPC/PEBC Award for Excellence in Research or Innovation in Assessment of Competence, AFPC/Pfizer Research Career Award, AFPC/Janssen Award for Innovation in Education and the AFPC National Award for Excellence in Education.

Traditional metrics of research quality include publications, citations and success in obtaining funding from external agencies. By these measures, the faculty at the School of Pharmacy has had considerable success considering that there were only 6 faculty members when the first undergraduate students were admitted a decade ago. Faculty in the School of Pharmacy have secured more than \$14 million in funding over the past 7 years to support their research despite the difficulty of starting new programs when funding through agencies such as CIHR has been historically challenging. Funding by source is listed in the table below:

Operating Research Funding (\$) by Source and Year ¹						
Fiscal Year ²	Tri-Agency Awards ³	Public Sector and Non-Profit Funding ⁴	Private Sector Funding ⁵	Internal Awards ⁶	Equipment Awards ⁷	Total
2011/12	\$576,780	\$267,000	\$15,000	\$16,000	\$33,149	\$907,929
2012/13	\$296,119	\$670,573	\$137,936	\$8,000	\$330,891	\$1,443,519
2013/14	\$389,947	\$1,977,761	\$175,580	\$18,000	\$25,935	\$2,587,223
2014/15	\$564,851	\$2,239,921	\$91,876	\$67,000	\$20,984	\$2,984,632
2015/16	\$679,359	\$2,554,091	\$221,573	\$25,000	\$43,684	\$3,523,707
2016/17	\$655,103	\$692,483	\$161,000	\$32,000	\$21,884	\$1,562,470
2017/18	\$754,905	\$286,182	\$315,670	\$0	\$28,385	\$1,385,142
Totals	\$3,917,064	\$8,688,012	\$1,118,635	\$166,000	\$504,912	\$14,394,623

Notes:

1. Data is reported on PI only. Table includes research awards for faculty identified by the program.
2. The fiscal year runs from April 1 until March 31.
3. Excludes equipment grants (e.g. NSERC RTI).
4. Excludes equipment and internal awards (e.g. CFI, UW-RIF, UW-SSHRC).
5. Includes funds received from Industry
6. Includes UW-RIF and UW-SSHRC.
7. Includes NSERC-RTI and CFI.

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The following table categorizes research funding according to field or discipline:

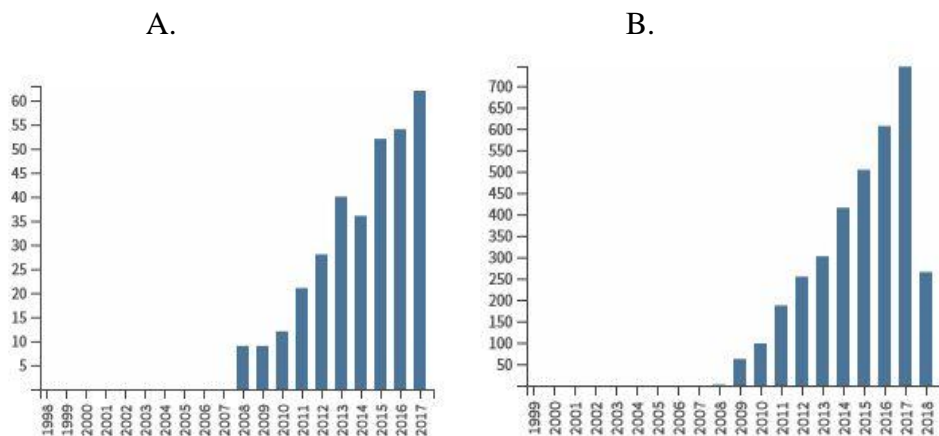
Total External Operating Funding (7 years) by Field ¹					
Field ²	Tri-Agency Awards ³	Public Sector and Non-Profit Funding ⁴	Private Sector Funding ⁵	Equipment Awards ⁶	Total
Drug Design: Molecular Pharmacology, Pharmacokinetics and Toxicology (MSc)	\$1,474,575	\$646,230	\$381,424	\$236,907	\$2,739,136
Pharmaceutical Discovery and Evaluation (PhD)	\$722,070	\$6,736,294	\$89,568	\$0	\$7,547,933
Pharmaceutics, drug-delivery, biotechnology	\$33,944	\$0	\$0	\$0	\$33,944
Pharmaceutics: Drug and Vaccine Delivery Systems and Nanomedicine (MSc)	\$1,341,210	\$1,305,487	\$464,848	\$268,005	\$3,379,550
Pharmacoeconomics, informatics, liver disease, oncology	\$310,265	\$0	\$172,795	\$0	\$483,060
Pharmacoepidemiology, diabetes, primary care	\$35,000	\$0	\$10,000	\$0	\$45,000
Total	\$3,917,064	\$8,688,012	\$1,118,635	\$504,912	\$14,228,623

Notes:

1. Data reported on the PI only. Table includes research awards for faculty members provided by the program for the past 7 fiscal years (April 1 – March 31).
2. Faculty members are listed in the Fields specified by the program.
3. Excludes equipment grants (e.g. NSERC RTI).
4. Excludes equipment and internal awards (e.g. CFI, UW-RIF, UW-SSHRC).
5. Includes funding from Industry.
6. Includes NSERC-RTI and CFI.

It should be noted that these tables do not include recent awards from CIHR, NSERC, private foundations and the Ontario Ministry of Health and Long-Term Care that total more than 2 million dollars in additional funding. Of particular relevance to the MPharm program, clinical and applied researchers have received grants from a range of public and private agencies including the Canadian Institutes of Health Research (2 operating grants, 1 New Investigator award), NSERC (1 Discovery grant, 1 Collaborative Research and Development grant), Ontario Ministry of Health and Long-term Care, Telus Health, Canadian Diabetes Association, Canadian Liver Foundation, Canadian Foundation for Pharmacy, Health Canada, and the Public Health Agency of Canada.

Full-time faculty members at the School of Pharmacy have authored or co-authored over 325 papers in the scientific or biomedical literature since the School opened in 2008 with a steady increase reflecting growth in the number of faculty and maturation of research programs. Citations have also increased accordingly with over 750 citations to research conducted by pharmacy faculty members in 2017:



Papers published (A) and Citations of papers published (B) annually by faculty members in the School of Pharmacy, University of Waterloo (Source: Science Citation Index)

A detailed description of the scholarly record of faculty can be found in the curriculum vitae's provided in Volume II.

3. PHYSICAL AND FINANCIAL RESOURCES

As a professional graduate program, tuition for this program is expected to be comparable to the rate of \$4,790 per term (\$14,370 per year) that is currently associated with the Master of Health Information program at the University of Waterloo. It is expected that 4-6 new students will be enrolled annually and at steady state, there will be ~ 15 MPharm students in the program (see section 5). It is anticipated that the majority will be domestic students. Revenue generated by the program should be sufficient to ensure that the program is self-sustaining and will not require additional funding from the School of Pharmacy, Faculty of Science or University of Waterloo. Revenue will be used to support a Program Director (part-time administrative assignment for a faculty member), an administrative assistant (0.2 FTE) and any additional costs associated with the program including the placement of students at clinical sites.

3.1 Library Resources

Library Services – Students will make extensive use of the biomedical literature and will require access to the university's electronic collection maintained by the library. Some electronic resources are obtained directly and some are obtained through membership in the Ontario Council of University Libraries (OCUL) and the Canadian Research Knowledge Network (CRKN). The primary tool for accessing electronic resources is its Web site (<http://www.lib.uwaterloo.ca>). This site organizes and provides access to licensed resources restricted to Waterloo faculty, students and

staff, as well as select Internet resources freely available to anyone. The Library has purchased, or subscribes to, research databases, full text journals, monographs, numeric data, and government publications. The electronic collection includes over 55,000 e-journals in a wide range of disciplines along with more than 640 e-journals that are classified as Pharmacy and Pharmacology. These resources will be sufficient to meet the needs of MPharm program.

The School has its own Learning Resource Centre which occupies ~ 2,000 square feet of space on the lower level of the pharmacy building with 24/7 access for faculty, staff, and students. The Liaison Librarian for Pharmacy (Caitlin Carter, MLIS) is the primary individual responsible for supporting the information needs of faculty and graduate students associated with the School of Pharmacy. Searching and retrieval of scientific information is a critical skill for graduate students and the librarian is available to provide formal instruction or informal consultation to assist graduate students with improving their capabilities in this area. The Liaison Librarian for Pharmacy develops information literacy-related activities and materials, in consultation with faculty. These include the development of online modules, research guides and screencasts as well as the seminars and outcomes-based workshops for students in the program.

3.2 Laboratory Resources

The School of Pharmacy has approximately 7,500 square feet of wet laboratory research space, primarily on the 3rd and 4th floor of the building, along with an animal holding facility on the main level to support animal research. In addition, there is an extensive suite of core equipment to support basic research. Students in the MPharm program will primarily be engaged in clinical or applied research that will involve data collection at the clinical site or the use of previously collected health information available within various administrative databases. However, there may be some projects that will take advantage of the equipment and wet laboratory resources available at the School of Pharmacy.

3.3 Computer Facilities

All faculty and graduate students are provided with an account on the Faculty of Science file server with ample storage. Wireless internet access is available throughout the Pharmacy building. Software packages, sold at discounted prices through educational software licenses, are available through the Campus Tech Shop.

The School of Pharmacy has recently completed construction of a Health Services and Applied Research Laboratory on the Lower Level to support clinical and applied research. The data centre occupies 2,300 square feet on the Lower Level of the building and significantly expands the capacity for clinical and applied research that requires intensive data analysis. This facility contains 18 work stations along with a

conference room and 4 private offices for patient interviews and data collection. The centre has been designed to meet necessary security requirements for working with private health information.

Faculty and graduate students at the School of Pharmacy have access to the South Western Ontario Research Data Centre (SWORDC) which is located on the main campus at the University of Waterloo. SWORDC (<http://www.rdc-cdr.ca/south-western-ontario-rdc-swo-rdc>) is supported and run by Statistics Canada and its purpose is to provide researchers secure access to a host of national household and population survey data without the need to travel to the main location in Ottawa. Researchers may request access to most Statistics Canada survey data which includes data of interest to health researchers ranging from Internet Use to Youth Smoking.

The Institute for Clinical Evaluative Sciences (ICES) provides secure access to health-related records in Ontario. ICES Central is located at Sunnybrook in Toronto and satellite centres are located at each of the universities with medical schools in Ontario. Although UW does not currently have its own ICES node, Dr. Colleen Maxwell from the School of Pharmacy is an ICES Scientist and other faculty can make arrangements to access this data by collaborating with ICES personnel.

The School of Pharmacy employs advanced audiovisual (A/V) equipment to support the clinical, research and teaching needs of graduate students. This includes equipment to broadcast and receive lectures to and from anywhere in the world.

3.4 Space

The School of Pharmacy occupies a state-of-the-art research and education building on the Health Sciences campus of the University of Waterloo. The building opened in 2009 and contains ~ 120,000 square feet of space. As mentioned under section 3.2 and 3.3, there is more than sufficient research space to support the needs of the MPharm program. No additional physical space requirements beyond those already available at the School of Pharmacy are anticipated. A number of classrooms are available for lectures and small group discussion.

3.5 Financial Support

Students in the MPharm program will not be funded by the School. However, it should be noted that students enrolled in this program will be licensed pharmacists who will be able to supplement their financial resources through part-time employment if necessary. Students may also have the opportunity to take on assignments as Teaching Assistants (TA) in the clinical and professional practice courses of the undergraduate curriculum. The School of Pharmacy will undertake fundraising initiatives in order to be able to provide bursaries for students with significant financial need.

4. CURRICULUM

4.1 The Intellectual Development and the Educational Experience of the Student

The School of Pharmacy currently has thesis-based MSc and PhD programs and has an administrative structure and other supports to foster the intellectual growth and educational experience of graduate students. The graduate programs of the School underwent an external review in 2016 and the following strengths were noted:

- Supportive & encouraging environment; good student/faculty relationship
- Strength and diversity of research faculty
- Pleasant physical working environment, 'office space and open-concept laboratory space'
- Program offers a cohesive approach with experiences that can cross boundaries within the pharmaceutical sciences or the study of pharmacy practice

The educational experience of the students in the MPharm program will be facilitated by a number of pre-existing programs and workshops that are available to current pharmacy students in the thesis-based graduate programs. These include a well-developed orientation program for graduate studies, workshops for teaching assistants and a travel program that provides support for students to attend professional and scientific conferences.

The intellectual growth and development of students in this program will occur primarily through completion of the curriculum and its associated learning outcomes as outlined in section 1.3. It should be noted that the program includes a significant experiential requirement, namely the completion of a clinical practicum involving a minimum of 750 hours in direct patient care. It is intended that this requirement be as flexible as possible in matching students with either institutional or primary care practice sites that are directly relevant to their career goals and areas of interest. Students will develop verbal and written communication skills throughout the program and this will be essential for success in the clinical practicum as well as in completing and presenting the results of the research project.

Future careers for graduates of the MPharm program include roles as clinical leaders and educators. To this end, the program includes milestones related to leadership and the development of teaching skills. In order to achieve this, students will complete workshops available on the main campus of the University of Waterloo and offered through the Centre for Teaching Excellence (teaching skills) and Student Success Centre (leadership).

4.2 Program Regulations

It is anticipated that there will be a single intake of a cohort of students in the Fall semester of each year. Admission requirements for the program have been described previously in section 1.4. General regulations, timelines and academic standards for progression within the program will follow the standard procedures used for graduate studies within the University of Waterloo.

4.3 Part-time Studies

The program will initially be offered to students who wish to enroll full-time. This will allow faculty to fully assess the structure of the program and determine whether the program is meeting the desired learning outcomes. It is recognized that there may be a demand for a part-time option for practicing pharmacists who wish to enroll in this program. Once the program is established and 2-3 cohorts have completed the curriculum, a part-time option will be explored.

4.4 Curriculum

The course requirements for the program were summarized in section 1.6. Students will focus on foundational coursework during the first 2 semesters and will typically begin the clinical practicum during Term 3. Students will identify a research supervisor by the end of the second semester and the supervisor will arrange for an advisory committee for the student. The research protocol will be developed and approved by the end of Term 4 with the final 2 semesters primarily devoted to completion of the research project. Students will prepare a paper suitable for publication based on the results of their research and will be required to present a research seminar. A typical plan of work for students in the MPharm program is suggested below (milestones may be completed at any time during the program):

Semester 1 – Fall

PHARM 651: Advanced Principles of Medication Management 1
Biostatistics course
PHARM 654: Critical Appraisal and Evidence-based Practice
Elective course

Semester 2 – Winter

PHARM 652: Advanced Principles of Medication Management 2
PHARM 655: Physical Assessment and Clinical Laboratory Testing
PHARM 653: Methods in Clinical and Applied Research
Elective course

Semester 3 – Spring/Summer

Graduate Studies Practicum

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Semester 4 - Fall

Graduate Studies Practicum

Semester 5 – Winter

Master’s Research Paper

Semester 6 – Spring/Summer

Master’s Research Paper

It should be noted that students may complete the milestones related to the Graduate Studies Practicum and the Master’s Research Paper over more than 2 semesters. This may be particularly advisable for the Master’s Research Paper since approval of the research protocol by the appropriate ethics committee at the University of Waterloo must occur before any data collection or analysis can begin. In addition, it may be advantageous for students who are conducting clinical research involving patients to begin their research while still engaged in the clinical practicum.

A detailed description of each of the courses in the MPharm curriculum is provided in Appendix 1. The following table maps the MPharm Learning Outcomes to the structure and content of the program:

MPharm Learning Outcome	MPharm Program Requirements
1. Demonstrate the ability to integrate and apply knowledge from a broad range of pharmaceutical, pharmacy and biomedical disciplines including, but not limited to, pharmaceuticals, pharmacology, pharmacokinetics, therapeutics, pharmacogenetics, pharmacoepidemiology, pharmacoconomics and pathophysiology to identify and manage the medication needs of a diverse patient population.	Completion of “Advanced Principles of Medication Management 1 and 2” during the first 2 semesters – Students will learn advanced principles of drug action, pharmacodynamics, pharmacogenomics and pharmacokinetics and will apply these principles to identifying and resolving drug-related problems in a variety of therapeutic areas. A problem-based learning approach will be used to maximize student learning.
2. Utilize problem-solving and decision making skills to develop and implement a comprehensive pharmaceutical care plan for individual patients in collaboration with patients and other health care providers using principles of evidence-based practice.	Completion of Clinical Practicum. Students will identify drug-related problems and manage the medication needs of a diverse range of patients in completing 750 hours.
3. Identify and critically analyze biomedical literature relevant to the care of patients or the development of a research proposal.	Completion of “Critical Appraisal and Evidence-based Practice”.
4. Understand the strengths and limitations of a diverse range of research methods that are used in clinical, translational and applied research.	Completion of “Research Methods in Clinical and Translational Research”.
5. Demonstrate the ability to develop a research hypothesis to address a clinically important problem and design an appropriate research protocol to test the hypothesis.	Students must prepare a research proposal and obtain approval from the appropriate ethics review committee.
6. Conduct a research project, analyze data using appropriate statistical methods to draw valid	Complete and successfully defend the research project to the satisfaction of the research advisory

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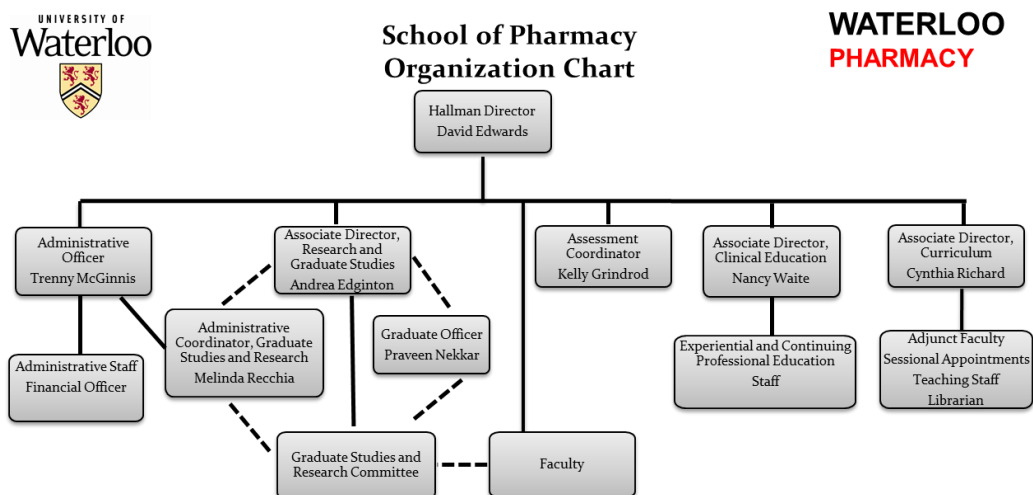
conclusions and prepare a publication-ready manuscript based on the results.	committee. Full-time students will normally complete this by the end of Term 6.
7. Effectively communicate drug and health information as well as care plans to patients, health care providers, policy makers and the lay public using appropriate verbal and written communication skills.	Students will be required to do verbal presentations in “Critical Appraisal and Evidence-based Practice”. Verbal and written communication with patients and health care providers will be extensive in the clinical practicum and will be assessed by the clinical supervisor.
8. Understand and use current best practices in pedagogy for educating patients, health professional students and practitioners in the classroom and clinical settings.	Completion of “Fundamentals of University Teaching” program.
9. Demonstrate leadership as well as professional and ethical behaviours and attitudes in clinical practice, teaching, and the conduct of research.	This is addressed in: Research Methods in Clinical and Translational Research; Clinical Practicum; Fundamentals of University Teaching; Student Leadership Program
10. Be committed to life-long learning understanding that best practices in research, education and patient care evolve as a result of the discovery, synthesis and integration of new evidence.	Emphasized throughout curriculum and illustrated in depth in “Critical Appraisal and Evidence-based Practice”.

4.5 Collateral and Supporting Departments

The School of Pharmacy has developed partnerships with other units within the University of Waterloo that will provide additional support to the MPharm program. Of particular relevance are collaborations with the School of Optometry and Vision Science, Centre for Bioengineering and Biotechnology as well as the Faculty of Applied Health Sciences (AHS). Researchers in AHS are active in public health and epidemiology which complement a number of pharmacy research programs.

4.6 Organizational Structure

The School of Pharmacy currently has ~ 40 graduate students in the MSc and PhD thesis-based graduate programs and has developed an effective administrative structure for supporting graduate education in order to ensure that students are meeting degree-level expectations. The Associate Director, Research and Graduate Studies has overall responsibility for the efficient administration of graduate studies in the School of Pharmacy and is assisted by the Graduate Officer who provides day-to-day oversight and is responsible for ensuring that graduate students have been correctly informed on academic, financial and other matters pertinent to their studies. A full-time Administrative Coordinator for Graduate Studies and Research provides the administrative support for the graduate program. These individuals along with several members of the faculty sit on the School of Pharmacy Graduate Studies and Research Committee which develops and enforces school-specific policies and procedures for graduate education that are consistent with those of the Faculty of Science and University of Waterloo. The organizational structure is depicted in the following figure:



5. PROJECTED ENROLMENT

Enrolment projections are based on an anticipated maximum intake of 6 full-time students and 3 part-time students when the program reaches full capacity in Year 5. Further increases in student enrollment may be considered if there is sufficient student demand and the School of Pharmacy has sufficient capacity for placement in clinical rotation sites and supervision of research projects.

Projected Student Intake and Enrolments for the Master of Pharmacy in Advanced Pharmacy Practice (MPharm) Program					
YEAR	FULL-TIME		PART-TIME		TOTAL
	Intake	Enrolments	Intake	Enrolments	
2019/20	4	4			4
2020/21	6	10			10
2021/22	6	12			12
2022/23	6	12	2	2	14
2023/24	6	12	3	5	17
2024/25	6	12	3	6	18
2025/26	6	12	3	6	18

6. FINANCIAL PLAN

A financial plan was approved by the Provost on March 15, 2018.

Prior to form submission, review the [new graduate program instructions](#). For questions about the form submission, contact [Trevor Clews](#), Graduate Studies and Postdoctoral Affairs.

Faculty: Science

Program: Master of Pharmacy (MPharm) in Advanced Pharmacy Practice

Program contact name(s):

Form completed by: Melinda Recchia, Administrative Coordinator Graduate Studies and Research

Note: new courses and milestones also require the completion/submission of the SGRC Course/Milestone-New/Revision/Inactivation form ([PC docx version](#)).

Proposed effective date: Term: Fall Year: 2019

[Graduate Studies Academic Calendar \(GSAC\)](#) section (include the link to the section (web page) where the new program will be located):

<https://uwaterloo.ca/graduate-studies-academic-calendar/science/school-pharmacy>

Proposed Graduate Studies Academic Calendar content:

MASTER OF PHARMACY (MPHARM) IN ADVANCED PHARMACY PRACTICE

Program information

- **Admit term(s)**
 - Fall
- **Delivery mode**
 - On-campus
- **Program type**
 - Master's
 - Professional
- **Registration option(s)**
 - Full-time
 - Part-time
- **Study option(s)**
 - Master's Research Paper

Admission requirements

- **Minimum requirements**
 - Minimum 78% in the final two years of accredited undergraduate Pharmacy degree program (BScPharm, or PharmD) or equivalent overall standing for internationally educated applicants.
 - Must be licensed or eligible for licensure as a pharmacist in Ontario.
 - It is highly desirable that applicants have completed at least one year of pharmacy practice or

Proposed Graduate Studies Academic Calendar content:

- an accredited pharmacy residency program prior to entering the MPharm program.
- An interview may be required.

- **Application materials**

- Résumé/Curriculum Vitae
- Supplementary information form
- Transcript(s)

- **References**

- Number of references: 2
- Type of references: academic or professional

[English language proficiency \(ELP\)](#) (if applicable)

Degree requirements

Master's Research Paper option:

- [Graduate Academic Integrity Module \(Graduate AIM\)](#)

- **Courses**

- Students must complete 8 one-term (0.5 unit weight) graduate level courses; 6 of the 8 courses are required and the remaining 2 are electives.
- Full-time students must complete required courses by the end of their third term in the program; elective courses may be completed later in the program.
- A minimum of 70% must be obtained in any graduate course taken by a Master of Pharmacy student to be granted pass standing, and the candidate must obtain an average of at least 75% in the courses presented in fulfillment of the Master of Pharmacy (MPharm) degree.
 - **Required courses:**
 - PHARM 651 Advanced Principles of Medication Management 1
 - PHARM 652 Advanced Principles of Medication Management 2
 - PHARM 653 Methods in Clinical and Applied Research
 - PHARM 654 Critical Appraisal and Evidence-based Practice
 - PHARM 655 Physical Assessment and Clinical Laboratory Testing
 - Biostatistics requirement: Students must complete an approved course in biostatistics or quantitative data analysis offered in the School of Pharmacy or other departments at the University of Waterloo.
 - **Elective courses:**
 - Students must complete a minimum of 2 elective courses selected on the basis of their individual career goals. Suggested courses may include but are not limited to special topics in primary care, pharmacoepidemiology, pharmacoconomics, systematic reviews, digital design, advanced statistics, computer science, leadership and management. Students will be encouraged to choose elective courses that are relevant to their anticipated career goals.
 - Graduate level courses from outside of the School of Pharmacy curriculum may be accepted toward these requirements if approved by the supervisor, Advisory Committee and Graduate Officer. Among the 2 elective courses taken, one 400-level course may be accepted toward this requirement if approved by the supervisor and Advisory Committee. The main criterion for acceptance will be based on gaining knowledge in an area that is outside the background of the student but will benefit their research program. Graduate students and their Advisory Committee must ensure that the course selection reflects a graduate degree in Pharmacy.
 - Students can only take 1 'Special Topics' course for credit toward their graduate degree program requirements (e.g. PHARM 608 or PHARM 611).

Proposed Graduate Studies Academic Calendar content:

- **Link(s) to courses**
 - Pharmacy (PHARM) courses
 - Graduate course search
- **Milestones**
 - **Academic Integrity Workshop**
 - **Fundamentals of University Teaching**
 - Students must complete the “Fundamentals of University Teaching” offered by the Centre for Teaching Excellence at the University of Waterloo. This program involves 6 teaching workshops and the delivery of three microteaching lessons to peers.
 - **Leadership Workshop**
 - The leadership workshop milestone requires students registered in the program to complete the leadership workshop such as the “Student Leadership Program” offered by the Student Success Office at University of Waterloo. the School of Pharmacy Student Leadership Workshop. This workshop will focus on leadership styles, communication and conflict management in order to provide students with skills relevant to professional leadership. With the approval of the graduate officer, students may fulfill this requirement by completing another suitable leadership program.
 - **Graduate Studies Practicum**
 - Students must complete a minimum of 750 hours of clinical experiences involving direct patient care in one or more health care settings (hospital, primary care, long-term care, community practice). Students will be able to tailor their clinical experiences in order to meet their future practice goals. The practicum will be supervised by a faculty member in the School of Pharmacy or a designated clinical supervisor affiliated with the School of Pharmacy. Clinical supervisors will complete a detailed rubric assessing student progress in a number of areas. Students will normally begin the clinical practicum during the third term.
 - **Master’s Research Paper**
 - Research projects will address an important problem related to an area of medication use or clinical practice. Students must write a protocol and conduct all aspects of the research including obtaining ethics approval, recruitment of participants, data collection, data analysis and preparation of a final report. publication-ready manuscript. Students will orally defend their completed research to the satisfaction of the advisory committee.

Department website <https://uwaterloo.ca/pharmacy/>

Discover Graduate Studies web page <https://uwaterloo.ca/discover-graduate-studies/>

Departmental approval date (05/24/18):

Reviewed by GSPA (for GSPA use only) date (mm/dd/yy): 06/01/2018

Faculty approval date (mm/dd/yy):

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

Faculty: Science

Effective term: Term/Year

Fall

2019

Course <input checked="" type="checkbox"/>	New	<input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	
Milestone <input type="checkbox"/>	New	<input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	

New milestone title: Choose an item.

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

Course Subject code: PHARM Course number: 651

Course Title (max. 100 characters incl. spaces): Advanced Principles of Medication Management 1

Course Short Title (max. 30 characters incl. spaces): Medication Management 1

Grading Basis: NUMERICAL

Course Credit Weight: 0.50

Course Consent Required: Instructor

Course Description: Students will learn advanced principles of drug action, pharmacogenomics, pharmacokinetics and therapeutics and will apply these principles to identifying and resolving drug-related problems in a variety of therapeutic areas. A problem-based learning approach will be used to maximize student learning.

New course description (for revision only):

Meet Type(s): Lecture Tutorial Reading

Primary Meet Type: Tutorial

[Antirequisite\(s\)](#) [Corequisite\(s\)](#) [Prerequisite\(s\)](#):

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: This course will provide students with foundational knowledge relevant to medication management in complex patients or complex drug regimens in specialized patient populations. The course will use problem-based learning as a pedagogical model in order to maximize student learning and further build skills related to information retrieval and analysis, collaboration and communication.

Prepared by: David Edwards

Date: 1-May-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course New Revision
 Inactivation

Milestone New Revision
 Inactivation

New milestone title: Choose an item.

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

Course Subject code: PHARM Course number: 652
Course Title (max. 100 characters incl. spaces): Advanced Principles of Medication Management 2
Course Short Title (max. 30 characters incl. spaces): Medication Management 2

Grading Basis: NUMERICAL

Course Credit Weight: 0.50

Course Consent Required: Instructor

Course Description: Students will build on the foundational knowledge and skills developed in
PHARM 651: Advanced Principles of Medication Management 1.

New course description (for revision only):

Meet Type(s): Lecture Tutorial Reading

Primary Meet Type: Tutorial

[Antirequisite\(s\)](#) [Corequisite\(s\)](#) [Prerequisite\(s\)](#):

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: Students will learn to manage increasingly complex patients and drug therapy regimens as they progress from PHARM 651 to PHARM 652.

Prepared by: David Edwards

Date: 1-May-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course <input checked="" type="checkbox"/>	New	<input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	
Milestone <input type="checkbox"/>	New	<input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	

New milestone title: Choose an item.

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

Course Subject code: PHARM Course number: 653

Course Title (max. 100 characters incl. spaces): Methods in Clinical and Applied Research

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

Grading Basis: NUMERICAL

Course Credit Weight: 0.50

Course Consent Required: Instructor

Course Description: This course will provide an overview of common research methods used to address questions in clinical, applied and translational research. Research ethics and responsible conduct of research will be addressed. This course will touch on basic concepts in successful grant writing.

New course description (for revision only):

Meet Type(s): Lecture

Primary Meet Type: Lecture

[Antirequisite\(s\)](#) [Corequisite\(s\)](#) [Prerequisite\(s\)](#):

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: This course will provide students with information that will contribute to achieving programmatic goals related to conducting clinical, applied and translational research.

Prepared by: David Edwards

Date: 1-May-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course <input checked="" type="checkbox"/>	New	<input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	
Milestone <input type="checkbox"/>	New	<input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	

New milestone title: Choose an item.

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

Course Subject code: PHARM Course number: 654

Course Title (max. 100 characters incl. spaces): Critical Appraisal and Evidence-based Practice

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

Grading Basis: NUMERICAL

Course Credit Weight: 0.50

Course Consent Required: Instructor

Course Description: Students will identify and critique papers from the primary drug literature. Skills related to critical appraisal and evidence-based practice will be developed. Students will have the opportunity to develop communications skills related to presenting scientific literature.

New course description (for revision only):

Meet Type(s): Seminar Lecture

Primary Meet Type: Seminar

[Antirequisite\(s\)](#) [Corequisite\(s\)](#) [Prerequisite\(s\)](#):

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: The ability to locate and analyze the drug literature is a critical skill for clinical practice, research and education and will be developed in this course.

Prepared by: David Edwards

Date: 1-May-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course <input checked="" type="checkbox"/>	New	<input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	
Milestone <input type="checkbox"/>	New	<input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	

New milestone title: Choose an item.

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

Course Subject code: PHARM Course number: 655

Course Title (max. 100 characters incl. spaces): Physical Assessment and Clinical Laboratory Testing

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

Grading Basis: NUMERICAL

Course Credit Weight: 0.50

Course Consent Required: Instructor

Course Description: Fundamental skills of physical assessment and the interpretation of clinical laboratory tests relevant to monitoring the effects associated with the use of medications will be covered.

New course description (for revision only):

Meet Type(s): Lecture Lab

Primary Meet Type: Lab

[Antirequisite\(s\)](#) [Corequisite\(s\)](#) [Prerequisite\(s\)](#):

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: In order to effectively monitor drug therapy in patients, students must be able to perform a basic physical exam and understand the value and limitations of a variety of clinical laboratory tests.

Prepared by: David Edwards

Date: 1-May-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course <input type="checkbox"/>	New	<input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	
Milestone <input checked="" type="checkbox"/>	New	<input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation	<input type="checkbox"/>	

New milestone title: **Academic Integrity Workshop**

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: See attached program proposal.

The milestone should be applied to the MPharm in Advanced Pharmacy Practice program.

Prepared by: Trevor Clews

Date: 1-Jun-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course <input type="checkbox"/>	New <input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation <input type="checkbox"/>	
Milestone <input checked="" type="checkbox"/>	New <input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation <input type="checkbox"/>	

New milestone title: Choose an item. **Fundamentals of University Teaching**

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: See attached program proposal.

The milestone should be applied to the MPharm in Advanced Pharmacy Practice program.

Prepared by: Trevor Clews

Date: 1-Jun-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course New Revision
 Inactivation

Milestone New Revision
 Inactivation

New milestone title: Choose an item. **Graduate Studies Practicum**

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: See attached program proposal.

The milestone should be applied to the MPharm in Advanced Pharmacy Practice program.

Prepared by: Trevor Clews

Date: 1-Jun-18

Faculty: Science

Effective term: Term/Year Fall 2019

Course <input type="checkbox"/>	New <input type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation <input type="checkbox"/>	
Milestone <input checked="" type="checkbox"/>	New <input checked="" type="checkbox"/>	Revision
<input type="checkbox"/>	Inactivation <input type="checkbox"/>	

New milestone title: Choose an item. **Master's Research Paper**

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: See attached program proposal.

The milestone should be applied to the MPharm in Advanced Pharmacy Practice program.

Prepared by: Trevor Clews

Date: 1-Jun-18

University of Waterloo

**REPORT FOR
MASTER OF PHARMACY
IN
ADVANCED PHARMACY PRACTICE**

Submitted to the
Ontario Universities Council on Quality Assurance

VOLUME II - CURRICULA VITAE OF THE FACULTY

MAY 2018

Volume II available here



EXTERNAL REVIEWERS' REPORT FOR NEW PROGRAMS

Reviewers' Report on the Proposed Masters Program in Pharmacy (MPharm) at the University of Waterloo.

Vicki L. Ellingrod, PharmD, FCCP

Associate Dean for Research and Graduate
Education
University of Michigan College of Pharmacy
428 Church Street
Ann Arbor, MI 48018 USA

Yvonne Shevchuk, PharmD, FCSHP

Associate Dean (Academic) and Director,
RxFiles Academic Detailing
University of Saskatchewan
E3114 Health Sciences
Saskatoon, SK S7N 5E5, Canada

SUMMARY

Please provide a brief synopsis (2-4 paragraphs) of your review that answers the following questions:

As part of this report, the newly proposed Master of Pharmacy (MPharm) program was reviewed on November 26 and 27, 2018. The review team would like to acknowledge the well written, concise report provided as well as the welcoming and open environment provided during our visit.

Briefly, the MPharm program is an advanced professional graduate-level program that includes three educational components, with an overall educational goal of training advanced pharmacist practitioners for careers in clinical practice, education and clinical research. The three components of the program are:

1. A structured curriculum consisting of eight courses (including five new pharmacy courses, a biostatistics course, and two elective courses) augmented by differing workshops on leadership and teaching
2. Completion of 750 hours of clinical practicum which will build on the didactic education component, and
3. A Master's research paper which will serve as a non-thesis capstone assignment.

Overall there was much enthusiasm for this program both within the School of Pharmacy, as well as within interviewed constituents at the University of Waterloo. All reviewers were also enthusiastic about the work done thus far in regards to the development of the program, realizing that the proposal as currently written may lack some details that will be important for implementation. That being said, the following points would be important for the School to consider as they move forward with the development and implementation of this program:

1. The overall institutional and school specific support for this program is strong.
2. Purposefully incorporate more interdisciplinary learning within the curriculum, beyond what is expected within the practicum experience.
3. The learning outcomes which have been mapped to the Masters Degree level expectations appear to be appropriate for the advanced practice learner who is desired for this program. The School should develop the specific assessment measures for these outcomes as part of this proposal
4. The faculty would be well served to think critically about the sequencing of the proposed classes to maximize the student's ability to successfully complete the research project. For example, consider requiring biostatistics in the first semester, followed by Pharm 653 in the next semester and allow students to complete their research protocol as part of this class.
5. Consider for the first few years, targeting the practicum experience to ambulatory care or patient centered family practice teams, to leverage the strengths of the current faculty, the family practice clinics adjacent to the School of Pharmacy as well as the stated need for more pharmacists able to work in family practice and primary care.
6. While financial details were not provided as part of Volume 1, the conversations with faculty and staff seemed to come to consensus that the personnel and space requirements to run this program are already available for the first few years. As the program grows, the School would be well served to assess the need for a dedicated staff person for recruitment of students. Additionally new faculty may need to be hired to accommodate more learners as this program grows.
7. Consider identifying way to financially subsidize students while in the program in an effort to assure equity for students who may come from marginalized populations
8. There was some concern at the graduate student level about new MPharm students competing for teaching assistant positions within the school. Additionally, there was concern from this group that creation of this program may make applying for residencies more competitive, if students were admitted without a residency and less than 1-2 years of experience in practice.

1. OUTLINE OF THE REVIEW

Please see appendix A, which is an itinerary of the program visit.

2. PROVIDE FEEDBACK ON EACH OF THE FOLLOWING EVALUATION CRITERIA

2.1 Objectives

Overall the newly proposed MPharm program is consistent with the institution's mission and academic plans. The program requirements and learning outcomes are clear and appropriate and are in alignment with the institution's statement of graduate Degree Level Expectations. Given that this is a professional graduate program, the MPharm nomenclature is appropriate and tracks with the professional Doctor of Pharmacy (PharmD) degree which is already offered by the School of Pharmacy.

During the onsite interviews, results from a recent survey of pharmacy alumni was provided to reviewers which supported the potential pool of students that might be interested in this

program. As part of this survey, alumni of the School of Pharmacy were asked “would you be interested in completing a Clinical Masters program which would provide advanced training to prepare for leadership roles in clinical practice, research, and/or education?” Of the 203 alumni who answered this question, 20% indicated they would be interested (n=40), 45% indicated they may be interested (n=92) and 35% indicated they would not be interested (n=71). While the demographics (i.e. number of years since graduation) of those that responded to this survey was not provided to the reviewers, we do feel these data are in support of the creation of the MPharm degree.

2.2 Admission requirements

As stated in Volume I of the graduate program proposal the following are the admission criteria for the program

- 1) Graduated from an accredited undergraduate pharmacy program leading to the BScPharm or PharmD degrees **and** be licensed or eligible for licensure as a pharmacist in Ontario.
- 2) A minimum average of 78% in the final two years of their undergraduate pharmacy degree (same standard as the MSc and PhD programs in the School of Pharmacy).
- 3) Outstanding verbal and written communication skills in English (assessed by personal interview) since these are essential to the achievement of a number of the programmatic learning outcomes.

The admission requirements are aligned with the learning outcomes, provided the program is able to recruit the type of student that is desired. Based on discussion with the faculty and School leaders, it was communicated to the reviewers that the ideal student for this program is a pharmacist with approximately 5 years or more of work experience who is looking for career advancement. The general overall admission criteria, however was written intentionally broad to allow for flexibility in admission decisions by increasing the applicant pool. Recruitment of ideal candidates for this program may be an issue long term as these potential students would be required to stop their employment, forgoing income while paying program tuition which may deter applicants, especially those with families or those who have to relocate for two years. Therefore the proposed part time, or work study option may be considered as soon as it is feasible in order to overcome these potential barriers for student application and successful completion.

Additionally, when looking specifically at the admission requirements, it does state that students who have completed a residency or have at least one year practice experience would be desired. This, however, appeared to be a bit different than what the reviewers were told, and therefore resulted in much discussion on the topic. Specifically this discussion focused on how MPharm students would differ on rotation compared to the pharmacy residents, or PharmD students if students who met the admission criteria listed above were admitted, and the desired applicant with 5 or more years of work experience was not admitted. Again, while recent pharmacy graduates are not the primary intended audience for this program, they will be part of the applicant pool and therefore this issue would need to be thoroughly fleshed out before the admission process occurs. The program faculty may consider “pilot testing” the admission criteria with their intended applicant pool to assure that the program description and associated criteria for admission resonate with that audience.

Lastly, in our meeting with some of the current graduate students, there were concerns voiced that if new pharmacy graduates are admitted to the program, completion of this MPharm may

create a situation where residencies would become more competitive. The envisioned scenario put forth by the students was that new graduates may apply for the MPharm, with the intention of then applying for a residency after their MPharm degree. This concern was discussed with the School of Pharmacy faculty and they felt that students completing the MPharm would not be interested in completing a residency after the MPharm program, as it would not add to the students' academic experience or credentials. However, it is recommended that the MPharm faculty think critically about this issue as it may become a potential unintended consequence of the program. Additionally, the students interviewed were concerned that addition of new graduate students to the school might result in greater competition for teaching assistantships. When this was discussed with the faculty, they felt this would not occur, as the MPharm students would most likely mean that practitioners from the outside would no longer need to be hired to help with some classes.

2.3 Structure

The master's degree, as outlined in Volume 1 of the graduate program proposal, is appropriately structured for the listed outcomes. The only program component which may require more discussion is the inclusion of 750 hours of practicum as the reviewers were unsure if this level of practicum would facilitate the identified outcomes related to advanced pharmacy practice.

2.4 Program content

The program course as outlined in Volume 1 of the graduate program proposal, appears appropriate for the intended outcomes for the MPharm degree. Furthermore, the content of the outlined curriculum appears to meet a critical need in the development of clinician scientists for both practice and academia. As the profession of pharmacy advances there is a need for a clinician that is highly trained in evidence based practices who can work effectively as part of an interdisciplinary team.

In Canada, pharmacy residencies are limited to a small number of one year programs and specialized residency training is lacking. These residency programs are typically hospital-based and funded, do not include formal coursework, and research training is limited. The MPharm program will focus on training of an advanced care practitioner who can manage complex patients or complex medication therapy in specialized patients using the framework provided by a master level evidence based training program.

The combined effect of the discontinuation of post-baccalaureate PharmD programs and the lack of residency training opportunities in Canada has resulted in a shortage of pharmacists with the advanced clinical and research skills needed to meet the needs of health care institutions and universities for clinical practitioners, educators and scientists.

In terms of specific content identified in the proposal, very few concerns were identified, however the curriculum committee might consider the following:

1. The faculty would be well served to think critically about the sequencing of the proposed classes to maximize the student's ability to successfully complete the research project. For example, consider requiring biostatistics in the first semester, followed by Pharm 653 in the next semester and then allow students to complete their research protocol as part of this class.
2. Purposefully incorporate more interdisciplinary learning within the curriculum, beyond what is expected within the practicum experience. Consider capitalizing on the teaching of current pharmacy faculty within the McMasters' family practice residency by

incorporating these two groups of learners into Pharmacy 654 or 655. Additionally, capitalizing on connections with other health science training programs would help to purposely incorporate interprofessional education and specific training related to working within a health care team. The assessment framework for the MPharm program should specifically measure interprofessional educational outcomes.

3. Include the pharmacy librarian as a content expert within the Pharmacy 654 class.
4. Consider inclusion of other health professional or pharmacy graduate students within the leadership workshop, as the reviewers feel that they would also benefit the program. Additionally, consider opening some of the newly developed classes to current graduate students.

2.5 Mode of delivery

Page 9 of Volume 1, of the graduate program proposal outlines the mode of delivery. The reviewers had no concerns about the mode of delivery as this seemed appropriate. Discussion regarding a collaboration with the University of Toronto is included in this section, but the status of these discussion are unknown. Formalization of this relationship would be a positive step.

2.6 Assessment of teaching and learning

The learning outcomes provided within Volume 1 of the graduate program proposal have been mapped to the Masters Degree level expectations and appear appropriate for the degree itself. As the specific assessment measures for these outcomes were not included in the proposal, the committee is unable to comment on specific assessment tools to be used. However, in discussion with various stakeholders, it appears that the School faculty are currently determining the optimal assessment tools for evaluation of the program. Identified assessment tools for the practicum experience include the Ontario Pharmacy Patient Care Assessment Tool (OPPCAT), Entrustable Professional Activities (EPAs), or Recognition of Prior Learning Assessment tools, as faculty determine the outcomes from the practicum experience. As it appears that the faculty have strong experience in using these tools, there were no concerns regarding this process.

For the didactic portion of the MPharm program it is recommended that the assessment committee capitalize on the structure provided to them through the Masters of Science programs within the School of Pharmacy. By doing this, they will be able to standardize the assessments for this new program and build on their experience with assessments from their Masters of Science and PhD programs.

Also included in this section is a statement regarding graduate supervision. Overall there is a need for greater details regarding the qualifications of the research supervisor and the make-up of the advisory committee. Clarification of these details would aid in the understanding of the mentoring team for each student and the qualifications of the mentor team. While it is anticipated that the research supervisor would be a School of Pharmacy faculty member, this was not specifically stated.

2.7 Resources for all programs

From the information the review committee was provided, it appears that overall the MPharm program is relatively cost neutral, as the tuition dollars afforded by the program would cover any necessary resources. The faculty interviewed felt that addition of these 4-6 (total enrolment up to 15) students a year would not result in any hardships related to overall faculty workload or space. The administrative personnel who would be charged with recruitment of

new students for the MPharm program, felt that initially, this additional workload appears to be within their capacity. As the program grows, however, the School would be well served to assess the need for a dedicated staff person for recruitment of students. Additionally new faculty may need to be hired to accommodate more learners as this program grows.

As no specific financial details were given to the committee, we are unable to specifically comment on financial resources.

2.8 Resources for graduate programs only

The current faculty within the School of Pharmacy, possess the necessary scientific training and clinical expertise to successfully mentor students within the MPharm program.

It is recommended that in the early years of the program, particularly for the practicum experiences, the clinical focus be somewhat narrowed to current faculty strengths in primary care and the School's academic relationship and close physical proximity to the family medicine residency program. As the program grows, the clinical focus for the students' practicum can expand in an as needed fashion, allowing for greater individualization of student learning and specialization.

Additionally, consideration should be given to the development a bursary or other financial assistance for students completing this program. Specifically, this should be developed to ensure diversity of the student body, recognizing that those in marginalized populations may find it especially difficult to relocate or forgo existing income and pay deregulated tuition. In keeping with the University's commitment to diversity, a long term goal of the MPharm program should be to undertake efforts to prioritize Indigenization of curriculum and the student body.

2.9 Resources for undergraduate programs only

Not applicable

2.10 Quality and other indicators *(to be inclusive of the institution's own additional quality indicators)*

Volume II of the graduate program proposal included curriculum vitae for all current School of Pharmacy faculty members. In review of this document, all faculty seem well qualified for supervision of MPharm students. Most notably, there are eleven current tenured or tenure-track faculty who have a broad array of research programs, and who are able to supervise MPharm students. Additionally there is one tenure track position that is currently open, and three clinical lecturers who are engaged in clinical, applied or translational research. Overall the reviewers had no concerns.

3. TOPICS FOR ADVICE

Not applicable

4. OTHER ISSUES (if any)

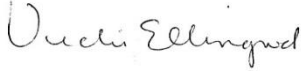
None noted

RECOMMENDATIONS

- 1) Continue development of the MPharm proposal, making sure to include specific assessments for all educational outcomes.
- 2) Continue to discuss the admittance criteria for the program, making sure that the targeted students are able to «see themselves » in the program.
- 3) Purposefully incorporate more interdisciplinary learning within the curriculum,

beyond what is expected to occur within the practicum experience.

- 4) Consider suggestions above regarding curriculum sequencing and focusing the practicum on primary care or family medicine.
- 5) Identify ways to increase diversity in the program.

Signature:  Date: 11/28/2018

Signature:  Date: 11/29/2018

Appendix A

MASTER OF PHARMACY, ADVANCED PHARMACY PRACTICE (MPHARM)

**New Academic Program Site Visit
November 26 and 27, 2018**

Site Visit Team:
Professor Vicki Ellingrod, University of Michigan Professor Yvonne Shevchuk, University of Saskatchewan Professor Veronica Kitchen, Political Science, University of Waterloo

Monday, November 26, 2018

7:30 a.m. – 8:30 a.m.	Breakfast meeting <i>Attendees:</i> Mario Coniglio, Associate Vice-President, Academic; Bob Lemieux, Dean of Science; David Edwards, Hallman Director, School of Pharmacy; Reviewers	Delta Waterloo Proof Kitchen & Lounge
8:30 a.m. – 9:00 a.m.	<i>Transportation from hotel to Needles Hall</i>	UWaterloo to transport
9:00 a.m. – 9:30 a.m.	Meeting with David Edwards, Hallman Director, School of Pharmacy	NH 3043
9:30 a.m. – 10:00 a.m.	Meeting with Shawn Wettig, Associate Director, Graduate Studies, Faculty of Science	NH 3043
10:00 a.m. – 10:30 a.m.	Meeting with Bob Lemieux, Dean of Science	NH 3043
10:30 a.m. – 11:00 a.m.	Meeting with Jim Rush Vice-President, Academic & Provost	NH 3001
11:00 a.m. – 11:30 a.m.	<i>Transportation from UW to Pharmacy</i>	PHR 7007/8 Waterloo Taxi Confirmation # 730947
11:30 p.m. – 12:00 p.m.	Tour of Pharmacy building and labs	
12:00 p.m. – 1:00 p.m.	LUNCH (REVIEWERS ONLY)	PHR 7007/8
1:00 p.m. – 1:30 p.m.	MEETING WITH FACULTY INVOLVED IN THE PROGRAM <i>Attendees:</i> Feng Chang, Marianna Foldvari, JM Gamble, Sherilyn Houle, Jamie Joseph, Tom McFarlane, Nardine Nakhla, Tejal Patel, William Wong	PHR 7007/8
1:30 p.m. – 2:15 p.m.	MEETING WITH GRADUATE STUDENTS <i>Attendees:</i> Ai-Leng Foong, Paul Malik, Lokesh Narsineni, Gokul Pullagura <i>[others still to confirm]</i>	PHR 7007/8
2:15 p.m. – 3:15 p.m.	MEETING WITH ANDREA EDGINTON, ASSOCIATE DIRECTOR, GRADUATE STUDIES & RESEARCH; PRAVEEN NEKKAR, GRADUATE OFFICER (BOTH FROM SCHOOL OF PHARMACY)	PHR 7007/8
3:15 p.m. – 3:30 p.m.	Break	PHR 7007/8
3:30 p.m. – 4:15 p.m.	Meeting with Graduate Studies & Research Committee, School of Pharmacy <i>Attendees:</i> Andrea Edginton, Heidi Fernandes, Sherilyn Houle, Jamie Joseph, Colleen Maxwell, Praveen Nekkar, Tejal Patel, Melinda Recchia	PHR 7007/8
4:15 p.m. – 4:45 p.m.	Meeting with staff involved in the program <i>Attendees:</i> Gail Bender, Admin Coord & Fin Asst; Dick Duplessi, Acting Financial Officer; Ken Manson, Experiential Coordinator, Patient Care	PHR 7007/8

	Rotations; Trenny McGinnis, Administrative Officer; Melinda Recchia, Admin Coord, Graduate Studies & Research	
5:00 p.m.	<i>Transportation from Pharmacy to hotel</i>	Waterloo Taxi Confirmation #799449

/tlm
November 13, 2018

MASTER OF PHARMACY, ADVANCED PHARMACY PRACTICE (MPHARM)

NEW ACADEMIC PROGRAM SITE VISIT

November 26 and 27, 2018

Site Visit Team:
Professor Vicki Ellingrod, University of Michigan Professor Yvonne Shevchuk, University of Saskatchewan Professor Veronica Kitchen, Political Science, University of Waterloo

Tuesday, November 27, 2018

8:30 a.m. – 9:00 a.m.	<i>Transportation from hotel to Pharmacy</i>	Waterloo Taxi Confirmation # 799451
9:00 a.m. – 9:30 a.m.	Meeting with Executive Committee, School of Pharmacy <i>Attendees:</i> Dave Edwards, Andrea Edginton, Kelly Grindrod, Trenny McGinnis, Ken Potvin, Cynthia Richard, Andrew Tolmie, Nancy Waite	PHR 7007/8
9:30 a.m. – 10:30 a.m.	Meeting with faculty involved in the program <i>Attendees:</i> Mike Beazely, Jonathan Blay, Kelly Grindrod, Emmanuel Ho, Colleen Maxwell, Jeff Nagge, Cynthia Richard, Roderick Slavcev, Nancy Waite, Shawn Wettig	PHR 7007/8
10:30 a.m. – 11:00 a.m.	Meeting with Caitlin Carter, Liaison Library, Pharmacy	PHR 7007/8
11:00 p.m. – 1:00 p.m.	Review and Lunch (reviewers only)	PHR 7007/8
1:00 p.m. – 1:30 p.m.	Recap meeting with David Edwards, Hallman Director, School of Pharmacy	PHR 7007/8
1:30 p.m. – 2:00 p.m.	Follow-up meeting with Mario Coniglio, Associate Vice-President, Academic; Amanda McKenzie, Director of Quality Assurance (Academic Programs)	PHR 7007/8
2:00 p.m.	<i>Transportation from School of Pharmacy to airport</i>	PHR 7007/8 Airways Transit confirmed W709699,W709698



RESPONSE TO EXTERNAL REVIEWERS' REPORT ON THE PROPOSED MASTER OF PHARMACY (MPHARM) IN ADVANCED PHARMACY PRACTICE

SUMMARY

An external review of the proposed Master of Pharmacy (MPharm) in Advanced Pharmacy Practice was conducted on November 26 and 27, 2018. The external review team consisted of:

Vicki Ellingrod, PharmD, FCCP
Associate Dean for Research and Graduate Education
University of Michigan College of Pharmacy

Yvonne Shevchuk, PharmD, FCSHP
Associate Dean (Academic) and Director
RxFiles Academic Detailing
College of Pharmacy and Nutrition
University of Saskatchewan

The review team was supported by Dr. Veronica Kitchen, Associate Professor, Department of Political Science, University of Waterloo.

Overall, the comments of the external reviewers were highly positive. Strengths and positive features of the program that were noted included:

1. Enthusiasm for the program both within the School of Pharmacy as well as with interviewed constituents at the University of Waterloo. Overall institutional and School of Pharmacy support for the program was strong.
2. Program requirements and learning outcomes are clear and aligned with the institution's statement of graduate Degree Level Expectations.
3. The program is appropriately structured and content is appropriate for the intended learning outcomes.
4. No concerns were identified regarding the mode of delivery of the program.
5. The current faculty in the School of Pharmacy have the necessary training and expertise to successfully mentor students in the MPharm program.

RESPONSE TO SPECIFIC RECOMMENDATIONS

1. CONTINUE DEVELOPMENT OF THE MPHARM PROPOSAL MAKING SURE TO INCLUDE SPECIFIC ASSESSMENTS FOR ALL EDUCATIONAL OUTCOMES

We will continue to develop the courses, policies and procedures for this program including the assessment of educational outcomes. As described in Section 1.8, the didactic courses in the curriculum will use traditional formative and summative assessment methods linked to the educational outcomes of the program. The clinical practicum is anticipated to use an evaluation rubric which is similar to that being used currently for undergraduate pharmacy students. The rubric was designed to be flexible enough to meet the needs of a diverse community of learners including pharmacy students, residents and practicing pharmacists and we believe that it will meet the needs of MPharm students with minimal modification. Educational outcomes related to research will be assessed by the supervisory committee using an approach that is similar to that used for research-based graduate programs although it is recognized that the research requirement in this course-based professional Masters is less intense than a research-based program. The supervisor for the research project will be a member of the regular faculty.

2. CONTINUE TO DISCUSS THE ADMITTANCE CRITERIA FOR THE PROGRAM, MAKING SURE THAT THE TARGETED STUDENTS ARE ABLE TO SEE THEMSELVES IN THE PROGRAM.

The admissions criteria are outlined in Section 1.4 and indicate that the preferred candidate for this program will have obtained at least one year of practice experience prior to entering the program. Although this is preferred, it is not possible at this time to determine what the applicant pool will look like. As pointed out by the reviewers, the intense competition for the limited number of pharmacy residencies in Ontario may lead to some highly qualified applicants applying to the MPharm program directly after completing their undergraduate degree. An admissions committee will be struck to evaluate prospective students and will monitor application trends to determine whether the program is in fact attracting the desired candidate pool with practice experience. This will be an important factor in determining appropriate the course-level objectives within the program.

3. PURPOSELY INCORPORATE MORE INTERDISCIPLINARY LEARNING WITHIN THE CURRICULUM, BEYOND WHAT IS EXPECT TO OCCUR WITHIN THE PRACTICUM EXPERIENCE

It has always been the intent that the MPharm program be highly interdisciplinary in nature. The program learning objectives state that students will be able to develop and implement a comprehensive pharmaceutical care plan "in collaboration with patients and other care providers" and that they will be able to effectively communicate with "patients, health care providers, policy makers and the lay public". As noted by the reviewers, the practicum is expected to provide students with rich opportunities for interdisciplinary learning. In addition, some of the required coursework will be interdisciplinary in nature. This is stated

in Section 1.7. Both PHARM 654: Critical Appraisal and Evidence-based Practice and PHARM 655: Physical Assessment and Clinical Laboratory Testing will take advantage of pre-existing relationships between the University of Waterloo School of Pharmacy, McMaster University Michael DeGroot School of Medicine (Waterloo campus), Centre for Family Medicine family health team and the McMaster KW and Area Family Medicine Residency program, all of which are co-located on the University of Waterloo Health Sciences campus in downtown Kitchener. Course-level objectives related to interprofessional learning will be explicitly stated as the syllabi for these courses are developed.

4. CONSIDER SUGGESTIONS ABOVE REGARDING CURRICULUM SEQUENCING AND FOCUSING THE PRACTICUM ON PRIMARY CARE OR FAMILY MEDICINE

We agree with the suggestions of the reviewers regarding course sequencing and have adjusted the plan of work outlined in Section 4.4 to indicate that the required biostatistics course should be offered in the first semester, prior to PHARM 653: Methods in Clinical and Applied Research. We also agree that focusing the practicum as much as possible in the area of primary care would align the program with the strengths of the faculty and the resources available to students on the Health Sciences campus. We do, however, anticipate that there will be highly qualified applicants to the program who are interested in specialized areas of care for which training may only be available in a tertiary care setting. The School of Pharmacy does have the necessary affiliations with these institutions across the province to accommodate such students.


5. IDENTIFY WAYS TO INCREASE DIVERSITY IN THE PROGRAM

Since a requirement for admission is licensure as a pharmacist in Ontario, it is expected that the students in this program will be broadly reflective of the pharmacist population in the province. This group is diverse across many dimensions with 40% of Ontario pharmacists being internationally trained and 58% being women. The reviewers note that a long-term goal of the program should be to prioritize indigenization of the curriculum and student body. While we agree with this objective, there are currently very few self-identified indigenous undergraduate pharmacy students or pharmacists in Ontario. The current first year undergraduate pharmacy class at University of Waterloo has 2 self-declared indigenous students out of 121 total students and this represents an increase over past cohorts. This issue must be addressed before diversity with respect to indigenous peoples can occur at the graduate level.

6. OTHER ISSUES

Financial support to subsidize students – The School of Pharmacy will explore opportunities to develop bursaries to support students in this program. However, it is noted that all students will be licensed pharmacists who should be able to work part-time during the program if necessary.

Competition for TA positions – There was some concern expressed by current graduate students that the requirement for MPharm students to take on TA assignments would increase competition for these roles. We do not believe that this will be the case since the MPharm students would most likely replace external pharmacist TA's not current graduate students. Nonetheless, the requirement for MPharm students to hold TA positions has been eliminated in favour of a more flexible approach to ensuring that learning outcomes related to teaching will be met.

Signature:  Date: Feb 1, 2019

David Edwards, PharmD, MPH, FCCP
Hallman Director and Professor
School of Pharmacy

Signature:  Date: Feb 4, 2019

Andrea Edginton, PhD
Associate Director, Research and Graduate Studies
Associate Professor
School of Pharmacy



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David Edwards, PharmD, MPH, FCCP
Hallman Director and Professor
School of Pharmacy

Signature:  Date: Feb 4, 2019

Andrea Edginton, PhD
Associate Director, Research and Graduate Studies
Associate Professor
School of Pharmacy

February 5, 2019

Dr. James Rush
Vice-President Academic & Provost
University of Waterloo

Re: Review of proposed Master in Pharmacy (MPHARM) in Advanced Pharmacy Practice

Dear Jim:

I write to provide my support for each of the recommendations in the reviewers' report of their recent review of the proposed Master in Pharmacy (MPHARM) in Advanced Pharmacy Practice program. Below are my responses to each of their recommendations.

1) Continue development of the MPharm proposal, making sure to include specific assessments for all educational outcomes.

Pharmacy

2) Continue to discuss the admittance criteria for the program, making sure that the targeted students are able to «see themselves » in the program.

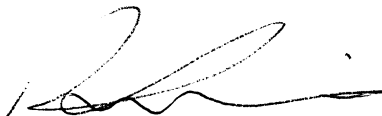
3) Purposefully incorporate more interdisciplinary learning within the curriculum, beyond what is expected to occur within the practicum experience.

4) Consider suggestions above regarding curriculum sequencing and focusing the practicum on primary care or family medicine.

5) Identify ways to increase diversity in the program.

I have every confidence in the program's plan forward.

Sincerely,



Robert P. Lemieux
Dean of Science





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: 1) Master of Arts (MA) in Political Science
2) Master of Arts (MA) in Political Science - Co-operative Program

Program contact name(s): Shelby Davies, Emmett Macfarlane

Form completed by: Shelby Davies

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](#)).

The department would like to remove our formal graduate research fields.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

Although our department has research strength in the areas of Canadian Politics, Conflict and Conflict Resolution, and Political Economy, these fields do not reflect the varied research projects our faculty can supervise (for example, we have several faculty who can supervise in the areas of comparative politics, and gender and politics). Additionally, eliminating formal fields may expand our applicant pool; currently, we risk losing applicants whose interests fall outside our three research fields. Instead, we will include a comprehensive list of project/research areas that our faculty can supervise/support on our website. Finally, having three formal research fields does not align with the delivery of our program, including course offerings.

Proposed effective date: Term: Fall Year: 2019

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-political-science/master-arts-ma-political-science>

<https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-political-science/master-arts-ma-political-science-co-operative-program>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Graduate research fields</p> <ul style="list-style-type: none"> • Canadian Politics • Conflict and Conflict Resolution • Political Economy <p>Program information</p>	<p>Program information</p> <ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall • Delivery mode <ul style="list-style-type: none"> ○ On-campus • Program type

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall • Delivery mode <ul style="list-style-type: none"> ○ On-campus • Program type <ul style="list-style-type: none"> ○ Master's ○ Research • Registration option(s) <ul style="list-style-type: none"> ○ Full-time ○ Part-time • Study option(s) <ul style="list-style-type: none"> ○ Thesis ○ Master's Research Paper <p>Admission requirements</p> <ul style="list-style-type: none"> • Minimum requirements <ul style="list-style-type: none"> ○ An Honours Bachelor's degree (or equivalent) in Political Science with at least a 78% overall standing. ○ Statement of Research. ○ Students with an Honours BA in a related discipline will be considered for admission but may be required to complete further work in Political Science before proceeding. Students with a General Bachelor of Arts (BA) in Political Science may be admitted to a qualifying program, and then apply for admission to the Master of Arts (MA) program after completion of that program. ○ Probationary students admitted to the program must achieve at least 75% in 2 predetermined courses in order to continue in the Winter term. Normally a student will not continue on probationary status for more than two terms. ○ Transitional students admitted are normally required to complete additional predetermined undergraduate or graduate courses and achieve at least a 75% average. • Application materials <ul style="list-style-type: none"> ○ Résumé ○ Supplementary information form ○ Transcript(s) ○ Writing sample • References <ul style="list-style-type: none"> ○ Number of references: 3 ○ Type of references: normally from academic sources 	<ul style="list-style-type: none"> ○ Master's ○ Research • Registration option(s) <ul style="list-style-type: none"> ○ Full-time ○ Part-time • Study option(s) <ul style="list-style-type: none"> ○ Thesis ○ Master's Research Paper <p>Admission requirements</p> <ul style="list-style-type: none"> • Minimum requirements <ul style="list-style-type: none"> ○ An Honours Bachelor's degree (or equivalent) in Political Science with at least a 78% overall standing. ○ Statement of Research. ○ Students with an Honours BA in a related discipline will be considered for admission but may be required to complete further work in Political Science before proceeding. Students with a General Bachelor of Arts (BA) in Political Science may be admitted to a qualifying program, and then apply for admission to the Master of Arts (MA) program after completion of that program. ○ Probationary students admitted to the program must achieve at least 75% in 2 predetermined courses in order to continue in the Winter term. Normally a student will not continue on probationary status for more than two terms. ○ Transitional students admitted are normally required to complete additional predetermined undergraduate or graduate courses and achieve at least a 75% average. • Application materials <ul style="list-style-type: none"> ○ Résumé ○ Supplementary information form ○ Transcript(s) ○ Writing sample • References <ul style="list-style-type: none"> ○ Number of references: 3 ○ Type of references: normally from academic sources • English language proficiency (ELP) (if applicable) <p>Degree requirements</p>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> • English language proficiency (ELP) (if applicable) <p>Degree requirements</p> <p>At the time of application, students are asked to provide the Department with a general outline of their research interests, together with a suggested Thesis or Master's Research Paper project. There are many opportunities for students and faculty to discuss research interests and the two options in the program. Upon arrival, the Graduate Officer assigns a faculty advisor to each student. Although the faculty advisor could become a student's supervisor, the advisor is to assist and offer advice on academic and administrative matters until a research supervisor is chosen.</p> <p>The Department presumes that all students are in the Master's Research Paper option. Students who wish to write a thesis may apply to do so at the end of the Fall term. A committee composed of the Graduate Officer, the prospective supervisor and prospective reader assesses a thesis proposal.</p> <p>Thesis option:</p> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> ○ Students must complete the equivalent of 4 one-term graduate level Political Science courses 0.50 unit weight) including PSCI 600 Theories and Methods of Political Analysis. ○ The overall average achieved in the 4 credit courses should be at least 70%. ○ Reading courses may supplement regular offerings in the program, although it is understood that they will be approved at the discretion of the Department. Students will normally be permitted to take 1 reading course as part of their degree. • Link(s) to courses <ul style="list-style-type: none"> ○ Political Science (PSCI) courses ○ Graduate course search • Academic Integrity Workshop • Master's Seminar <ul style="list-style-type: none"> ○ Students are required to participate in a Master's Seminar (also referred to as a Methods Workshop) in the winter term: 	<p>At the time of application, students are asked to provide the Department with a general outline of their research interests, together with a suggested Thesis or Master's Research Paper project. There are many opportunities for students and faculty to discuss research interests and the two options in the program. Upon arrival, the Graduate Officer assigns a faculty advisor to each student. Although the faculty advisor could become a student's supervisor, the advisor is to assist and offer advice on academic and administrative matters until a research supervisor is chosen.</p> <p>The Department presumes that all students are in the Master's Research Paper option. Students who wish to write a thesis may apply to do so at the end of the Fall term. A committee composed of the Graduate Officer, the prospective supervisor and prospective reader assesses a thesis proposal.</p> <p>Thesis option:</p> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> ○ Students must complete the equivalent of 4 one-term graduate level Political Science courses 0.50 unit weight) including PSCI 600 Theories and Methods of Political Analysis. ○ The overall average achieved in the 4 credit courses should be at least 70%. ○ Reading courses may supplement regular offerings in the program, although it is understood that they will be approved at the discretion of the Department. Students will normally be permitted to take 1 reading course as part of their degree. • Link(s) to courses <ul style="list-style-type: none"> ○ Political Science (PSCI) courses ○ Graduate course search • Academic Integrity Workshop • Master's Seminar <ul style="list-style-type: none"> ○ Students are required to participate in a Master's Seminar (also referred to as a Methods Workshop) in the winter term: they will present their in-progress thesis/MRP work and provide feedback to fellow students. • Master's Thesis

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>they will present their in-progress thesis/MRP work and provide feedback to fellow students.</p> <ul style="list-style-type: none"> • Master's Thesis <ul style="list-style-type: none"> ○ Students must submit and defend a thesis embodying the results of original research. ○ The thesis is the equivalent of 4 one-term courses (0.50 unit weight), and therefore should occupy roughly half of the student's allotted time. ○ Students are allowed much latitude in the choice of research topic, it is expected that the thesis itself to be somewhat narrow in scope and analytically well-defined. Students sometimes do not appreciate how ambitious their initial proposals are. One elementary criterion of a suitable topic is that it can be completed within the time allotted. ○ Students must apply to write a thesis at the end of the Fall term. The thesis proposal is assessed early in the Winter term by the Graduate Officer and the prospective supervisor and reader. <p>Master's Research Paper option:</p> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> ○ Students must complete the equivalent of 6 one-term graduate level Political Science courses (0.50 unit weight) including PSCI 600 Theories and Methods of Political Analysis. ○ The overall average achieved in the 6 credit courses should be at least 70%. ○ Reading courses may supplement regular offerings in the program, although it is understood that they will be approved at the discretion of the Department. Students will normally be permitted to take 1 reading course as part of their degree. • Link(s) to courses <ul style="list-style-type: none"> ○ Political Science (PSCI) courses ○ Graduate course search • Academic Integrity Workshop • Master's Seminar <ul style="list-style-type: none"> ○ Students are required to participate in a Master's Seminar (also referred to as a Methods Workshop) in the winter term: 	<ul style="list-style-type: none"> ○ Students must submit and defend a thesis embodying the results of original research. ○ The thesis is the equivalent of 4 one-term courses (0.50 unit weight), and therefore should occupy roughly half of the student's allotted time. ○ Students are allowed much latitude in the choice of research topic, it is expected that the thesis itself to be somewhat narrow in scope and analytically well-defined. Students sometimes do not appreciate how ambitious their initial proposals are. One elementary criterion of a suitable topic is that it can be completed within the time allotted. ○ Students must apply to write a thesis at the end of the Fall term. The thesis proposal is assessed early in the Winter term by the Graduate Officer and the prospective supervisor and reader. <p>Master's Research Paper option:</p> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> ○ Students must complete the equivalent of 6 one-term graduate level Political Science courses (0.50 unit weight) including PSCI 600 Theories and Methods of Political Analysis. ○ The overall average achieved in the 6 credit courses should be at least 70%. ○ Reading courses may supplement regular offerings in the program, although it is understood that they will be approved at the discretion of the Department. Students will normally be permitted to take 1 reading course as part of their degree. • Link(s) to courses <ul style="list-style-type: none"> ○ Political Science (PSCI) courses ○ Graduate course search • Academic Integrity Workshop • Master's Seminar <ul style="list-style-type: none"> ○ Students are required to participate in a Master's Seminar (also referred to as a Methods Workshop) in the winter term: they will present their in-progress thesis/MRP work and provide feedback to fellow students. • Master's Research Paper

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>they will present their in-progress thesis/MRP work and provide feedback to fellow students.</p> <ul style="list-style-type: none"> • Master's Research Paper <ul style="list-style-type: none"> ○ The Master's Research Paper is best thought of as a "mini thesis" and is the equivalent of 2 one-term courses (0.50 unit weight). The work is co-supervised by two faculty members who may ask for corrections and who jointly decide on the grade to be awarded upon completion. ○ Students must achieve a grade of 75% or higher on their MRP in order to satisfy the degree requirements for the program. 	<ul style="list-style-type: none"> ○ The Master's Research Paper is best thought of as a "mini thesis" and is the equivalent of 2 one-term courses (0.50 unit weight). The work is co-supervised by two faculty members who may ask for corrections and who jointly decide on the grade to be awarded upon completion. ○ Students must achieve a grade of 75% or higher on their MRP in order to satisfy the degree requirements for the program

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

Although current students had the option to select a research field when applying, this is not something the department formally tracks, and many students end up with a research interest outside their original declaration.

Departmental approval date (mm/dd/yy): 01/29/2019

Reviewed by GSO (for GSO use only) date (mm/dd/yy): 02/05/2019

Faculty approval date (mm/dd/yy): 03/19/19

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

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

Faculty: Engineering

Program: Graduate Diploma (GDip) in Computer Networking and Security

Program contact name(s): Jessica Rossi

Form completed by: Jessica Rossi

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](#)).

Discontinue (type 2) Graduate Diploma (GDip) in Computer Networking and Security.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

The MEng in ECE program will be offering “Graduate Specializations” in a given area, in place of the currently offered Graduate Diplomas. The change from Graduate Diplomas to Graduate Specializations is to better reflect the nature of the course packaging and also to bring the credentialization of focused course selection into line with Faculty of Engineering objectives.

Consequently, ECE will be discontinuing the existing Graduate Diplomas offered with the MEng. In their place, Graduate Specializations have been proposed.

Proposed effective date: Term: Fall Year: 2019

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-electrical-and-computer-engineering/graduate-diploma-gdip-computer-networking-and-security>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>GRADUATE DIPLOMA (GDIP) IN COMPUTER NETWORKING AND SECURITY</p> <p>Program information</p> <ul style="list-style-type: none"> • Delivery mode <ul style="list-style-type: none"> ◦ On-campus • Program type <ul style="list-style-type: none"> ◦ Diploma • Study option(s) 	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p data-bbox="233 132 440 163">◦ <u>Coursework</u></p> <p data-bbox="90 201 435 233">Admission requirements</p> <ul style="list-style-type: none"> <li data-bbox="136 275 488 306">• Minimum requirements <ul style="list-style-type: none"> <li data-bbox="233 306 786 474">◦ The GDip in Computer Networking and Security is earned in conjunction with the Master of Engineering (MEng) in Electrical and Computer Engineering program. <p data-bbox="90 512 383 543">Degree requirements</p> <p data-bbox="185 579 440 611">Coursework option:</p> <ul style="list-style-type: none"> <li data-bbox="136 653 302 684">• Courses <ul style="list-style-type: none"> <li data-bbox="233 684 797 1052">◦ Students will be exposed to the fundamental, advanced, and practical aspects of computer networks, security, and distributed computing systems. They will gain knowledge in the field of local and wide area networks – both wired and wireless. Students will learn designing network based systems for parallel and distributed processing; and the security aspects of communication and distributed system applications. <li data-bbox="233 1052 797 1188">◦ To receive the GDip in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses: <ul style="list-style-type: none"> <li data-bbox="331 1188 651 1220">• Compulsory courses: <ul style="list-style-type: none"> <li data-bbox="428 1220 740 1314">• ECE 610 Broadband Communication Networks <li data-bbox="428 1314 727 1388">• ECE 628 Computer Network Security <li data-bbox="428 1388 776 1482">• ECE 655 Protocols, Software, and Issues in Mobile Systems <li data-bbox="331 1482 797 1556">• Elective courses (choose 2 from the following list): <ul style="list-style-type: none"> <li data-bbox="428 1556 732 1629">• ECE 606 Algorithm Design and Analysis <li data-bbox="428 1629 792 1703">• ECE 651 Foundations of Software Engineering <li data-bbox="428 1703 678 1818">• ECE 653 Software Testing, Quality Assurance and Maintenance <li data-bbox="428 1818 760 1892">• ECE 654 Software Reliability Engineering <li data-bbox="428 1892 724 1965">• ECE 656 Database Systems 	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> * ECE 657 Tools of Intelligent Systems Design * ECE 658 Component Based Software o Note: Electrical and Computer Engineering MEng requirements allow for only 3 courses to be taken outside the Department. • Link(s) to courses <ul style="list-style-type: none"> o Electrical and Computer Engineering (ECE) courses o Graduate course search <p>Department of Electrical and Computer Engineering website</p>	

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

Students admitted to the MEng program prior to Fall 2019, and complete the course requirements for a GDip Computer Networking and Security, will receive the GDip upon degree completion.

Departmental approval date (mm/dd/yy): 01/18/19

Reviewed by GSO (for GSO use only) date (mm/dd/yy): 02/22/2019

Faculty approval date (mm/dd/yy): 02/26/2019

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

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

Faculty: Engineering

Program: Graduate Diploma (GDip) in Sustainable Energy

Program contact name(s): Jessica Rossi

Form completed by: Jessica Rossi

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](#)).

Discontinue (type 2) Graduate Diploma (GDip) in Sustainable Energy.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

The MEng in ECE program will be offering “Graduate Specializations” in a given area, in place of the currently offered Graduate Diplomas. The change from Graduate Diplomas to Graduate Specializations is to better reflect the nature of the course packaging and also to bring the credentialization of focused course selection into line with Faculty of Engineering objectives.

Consequently, ECE will be discontinuing the existing Graduate Diplomas offered with the MEng. In their place, Graduate Specializations have been proposed.

Proposed effective date: Term: Fall Year: 2019

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-electrical-and-computer-engineering/graduate-diploma-gdip-sustainable-energy>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>GRADUATE DIPLOMA (GDIP) IN SUSTAINABLE ENERGY</p> <p>Program information</p> <ul style="list-style-type: none"> • Delivery mode <ul style="list-style-type: none"> ◦ On-campus • Program type <ul style="list-style-type: none"> ◦ Diploma • Study option(s) 	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p data-bbox="233 134 440 163">◦ <u>Coursework</u></p> <p data-bbox="90 203 435 233">Admission requirements</p> <ul style="list-style-type: none"> <li data-bbox="139 275 488 304">• Minimum requirements <ul style="list-style-type: none"> <li data-bbox="233 308 789 438">◦ The GDip in Sustainable Energy is earned in conjunction with the Master of Engineering (MEng) in Electrical and Computer Engineering program. <p data-bbox="90 478 383 508">Degree requirements</p> <p data-bbox="185 548 440 577">Coursework option:</p> <ul style="list-style-type: none"> <li data-bbox="139 617 302 646">• Courses <ul style="list-style-type: none"> <li data-bbox="233 651 797 911">◦ Students will be exposed to different aspects of sustainable energy sources including the theory of operation and analysis of wind turbines, fuel cells and photovoltaic. Interfacing these energy sources with the electric utility grid and their effects on electricity market pricing will be addressed. <li data-bbox="233 915 776 1045">◦ To receive the GDip in Sustainable Energy, students must successfully complete 2 compulsory courses and 3 elective courses. <ul style="list-style-type: none"> <li data-bbox="328 1050 651 1079">* Compulsory courses: <ul style="list-style-type: none"> <li data-bbox="422 1083 691 1146">* ECE 663 Energy Processing <li data-bbox="422 1150 743 1213">* ECE 668 Distribution System Engineering <li data-bbox="328 1218 792 1348">* Elective courses (choose 3 from the following list): Note: not all elective courses may be offered each year. <ul style="list-style-type: none"> <li data-bbox="422 1352 756 1415">* ECE 632 Photovoltaic Energy Conversion <li data-bbox="422 1419 737 1482">* ECE 661 HVDC and FACTS <li data-bbox="422 1486 786 1549">* ECE 662 Power System Analysis and Control <li data-bbox="422 1554 786 1650">* ECE 664 Power System Components and Modelling <li data-bbox="422 1654 797 1717">* ECE 665 High Voltage Engineering Applications <li data-bbox="422 1722 721 1785">* ECE 666 Power Systems Operation <li data-bbox="422 1789 748 1885">* ECE 667 Sustainable Distributed Power Generation <li data-bbox="422 1890 721 1953">* ECE 669 Dielectric Materials 	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> • ECE 768 Power System Quality ○ Note: Electrical and Computer Engineering MEng requirements allow for only 3 courses to be taken outside the Department. • Link(s) to courses <ul style="list-style-type: none"> ○ Electrical and Computer Engineering (ECE) courses ○ Graduate course search <p>Department of Electrical and Computer Engineering website</p>	

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

Students admitted to the MEng program prior to Fall 2019, and complete the course requirements for a GDip in Sustainable Energy, will receive the GDip upon degree completion.

- Departmental approval date (mm/dd/yy):** 01/18/19
- Reviewed by GSO (for GSO use only) date (mm/dd/yy):** 02/22/2019
- Faculty approval date (mm/dd/yy):** 02/26/2019
- Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):**
- Senate approval date (mm/dd/yy) (if applicable):**

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

Faculty: Engineering

Program: Master of Engineering (MEng) in Electrical and Computer Engineering

Program contact name(s): Jessica Rossi

Form completed by: Jessica Rossi

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Course/Milestone-New/Revision/Inactivation form ([PC docx version](#) or [MAC docx version](#)).

Update of MEng degree requirements to include 2 new specializations.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

The MEng in ECE program will be offering “Graduate Specializations” in a given area, in place of the currently offered Graduate Diplomas. The change from Graduate Diplomas to Graduate Specializations is to better reflect the nature of the course packaging and also to bring the credentialization of focused course selection into line with Faculty of Engineering objectives.

Consequently, ECE will be discontinuing the existing Graduate Diplomas offered with the MEng. In their place, Graduate Specializations have been proposed.

Proposed effective date: Term: Fall Year: 2019

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

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

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Program information</p> <ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall ○ Winter ○ Spring • Delivery mode <ul style="list-style-type: none"> ○ On-campus • Length of program <ul style="list-style-type: none"> ○ The minimum period of full-time registration for the program is three terms and the maximum allowable time is six terms of 	<p><u>Graduate specializations</u></p> <ul style="list-style-type: none"> • Computer Networking and Security • Sustainable Energy <p>Program information</p> <ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall ○ Winter ○ Spring

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>active registration. For part-time students, the minimum period of registration for the program is six terms and the maximum allowable time is fifteen consecutive terms.</p> <ul style="list-style-type: none"> • Program type <ul style="list-style-type: none"> ○ Master's ○ Professional • Registration option(s) <ul style="list-style-type: none"> ○ Full-time ○ Part-time • Study option(s) <ul style="list-style-type: none"> ○ Coursework <p>Admission requirements</p> <ul style="list-style-type: none"> • Minimum requirements <ul style="list-style-type: none"> ○ The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada. • Application materials <ul style="list-style-type: none"> ○ Résumé ○ Supplementary information form ○ Transcript(s) • References <ul style="list-style-type: none"> ○ Number of references: 2 ○ Type of references: at least 1 academic • English language proficiency (ELP) (if applicable) <p>Degree requirements</p> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> • Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department. • Students may register for any ECE course at the 600 or 700 levels. • A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Math and Science. 	<ul style="list-style-type: none"> • Delivery mode <ul style="list-style-type: none"> ○ On-campus • Length of program <ul style="list-style-type: none"> ○ The minimum period of full-time registration for the program is three terms and the maximum allowable time is six terms of active registration. For part-time students, the minimum period of registration for the program is six terms and the maximum allowable time is fifteen consecutive terms. • Program type <ul style="list-style-type: none"> ○ Master's ○ Professional • Registration option(s) <ul style="list-style-type: none"> ○ Full-time ○ Part-time • Study option(s) <ul style="list-style-type: none"> ○ Coursework <p>Admission requirements</p> <ul style="list-style-type: none"> • Minimum requirements <ul style="list-style-type: none"> ○ The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada. • Application materials <ul style="list-style-type: none"> ○ Résumé ○ Supplementary information form ○ Transcript(s) • References <ul style="list-style-type: none"> ○ Number of references: 2 ○ Type of references: at least 1 academic • English language proficiency (ELP) (if applicable) <p>Degree requirements</p> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> • Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> • A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. • Students wishing to complete one of the four Graduate Diplomas as part of their MEng program should consult the list of required courses for each Diploma before selecting courses. 	<ul style="list-style-type: none"> • Students may register for any ECE course at the 600 or 700 levels. • A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Math and Science. • A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. • Students wishing to complete a <u>Graduate Specialization</u> as part of their MEng program should consult the list of required courses for each <u>Graduate Specialization</u> before selecting courses. <p><u>Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations:</u></p> <ol style="list-style-type: none"> 1. <u>Computer Networking and Security</u> 2. <u>Sustainable Energy</u> <p><u>A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.</u></p> <p><u>All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 5 graduate (0.50 weight) level courses and this set is comprised of a mix of <i>compulsory</i> and <i>elective</i> courses. <i>Compulsory</i> courses are those that are prescribed as part of the Graduate Specialization. <i>Elective</i> courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.</u></p> <ol style="list-style-type: none"> 1. <u>Graduate Specialization in Computer Networking and Security</u> <ul style="list-style-type: none"> • <u>To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses:</u> <ul style="list-style-type: none"> ○ <u>Compulsory courses:</u> <ul style="list-style-type: none"> ▪ <u>ECE 610 Broadband Communication Networks</u> ▪ <u>ECE 628 Computer Network Security</u> ▪ <u>ECE 655 Protocols, Software, and Issues in Mobile Systems</u> ○ <u>Elective courses (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ECE 606 Algorithm Design and Analysis</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	<ul style="list-style-type: none"> ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 656 Database Systems ▪ ECE 657 Tools of Intelligent Systems Design ▪ ECE 659 Intelligent Sensors & Wireless Sensor Network ▪ ECE 715 Wireless Communication Networks ▪ ECE 716 Communication Security <p>2. Graduate Specialization in Sustainable Energy</p> <p><u>To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 2 compulsory courses and 3 elective courses:</u></p> <ul style="list-style-type: none"> ○ <u>Compulsory courses:</u> <ul style="list-style-type: none"> ▪ ECE 663 Energy Processing ▪ ECE 760 Topic-10: Operation and Control of Future Integrated Energy Systems ○ <u>Elective courses (choose 3 from the following list): Note: not all elective courses may be offered each year.</u> <ul style="list-style-type: none"> ▪ ECE 661 HVDC and FACTS ▪ ECE 662 Power System Analysis and Control ▪ ECE 664 Power System Components and Modelling ▪ ECE 665 High Voltage Engineering Applications ▪ ECE 666 Power Systems Operation ▪ ECE 667 Sustainable Distributed Power Generation ▪ ECE 668 Distribution System Engineering ▪ ECE 669 Dielectric Materials ▪ ECE 768 Power System Quality ▪ ECE 765 Power System Protection and Relaying

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

Students admitted to the MEng program prior to Fall 2019, and complete the course requirements for a GDip in either Sustainable Energy or Computer Networking and Security, will receive the GDip upon degree completion.

Departmental approval date (mm/dd/yy): 01/18/19

Reviewed by GSO (for GSO use only) date (mm/dd/yy): 02/22/2019

Faculty approval date (mm/dd/yy): 02/26/19

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

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

Faculty: Engineering

Program: Master of Engineering (MEng) in Electrical and Computer Engineering

Program contact name(s): Jessica Rossi

Form completed by: Jessica Rossi

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Course/Milestone-New/Revision/Inactivation form ([PC docx version](#) or [MAC docx version](#)).

Update of MEng degree requirements to include 2 new specializations.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

The MEng in ECE program will be offering “Graduate Specializations” in a given area, in place of the currently offered Graduate Diplomas. The change from Graduate Diplomas to Graduate Specializations is to better reflect the nature of the course packaging and also to bring the credentialization of focused course selection into line with Faculty of Engineering objectives.

Consequently, ECE will be discontinuing the existing Graduate Diplomas offered with the MEng. In their place, Graduate Specializations have been proposed.

Proposed effective date: Term: Winter Year: 2020

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

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

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Graduate specializations</p> <ul style="list-style-type: none"> • Computer Networking and Security • Sustainable Energy <p>Program information</p> <ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall ○ Winter ○ Spring 	<p>Graduate specializations</p> <ul style="list-style-type: none"> • Artificial Intelligence and Machine Learning • Computer Networking and Security • Nanoelectronic Circuits and Systems • Sustainable Energy <p>Program information</p> <ul style="list-style-type: none"> • Admit term(s) <ul style="list-style-type: none"> ○ Fall

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> • Delivery mode <ul style="list-style-type: none"> ○ On-campus • Length of program <ul style="list-style-type: none"> ○ The minimum period of full-time registration for the program is three terms and the maximum allowable time is six terms of active registration. For part-time students, the minimum period of registration for the program is six terms and the maximum allowable time is fifteen consecutive terms. • Program type <ul style="list-style-type: none"> ○ Master's ○ Professional • Registration option(s) <ul style="list-style-type: none"> ○ Full-time ○ Part-time • Study option(s) <ul style="list-style-type: none"> ○ Coursework 	<ul style="list-style-type: none"> ○ Winter ○ Spring • Delivery mode <ul style="list-style-type: none"> ○ On-campus • Length of program <ul style="list-style-type: none"> ○ The minimum period of full-time registration for the program is three terms and the maximum allowable time is six terms of active registration. For part-time students, the minimum period of registration for the program is six terms and the maximum allowable time is fifteen consecutive terms. • Program type <ul style="list-style-type: none"> ○ Master's ○ Professional • Registration option(s) <ul style="list-style-type: none"> ○ Full-time ○ Part-time • Study option(s) <ul style="list-style-type: none"> ○ Coursework
<h3>Admission requirements</h3> <ul style="list-style-type: none"> • Minimum requirements <ul style="list-style-type: none"> ○ The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada. • Application materials <ul style="list-style-type: none"> ○ Résumé ○ Supplementary information form ○ Transcript(s) • References <ul style="list-style-type: none"> ○ Number of references: 2 ○ Type of references: at least 1 academic • English language proficiency (ELP) (if applicable) 	<h3>Admission requirements</h3> <ul style="list-style-type: none"> • Minimum requirements <ul style="list-style-type: none"> ○ The Department of Electrical and Computer Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada. • Application materials <ul style="list-style-type: none"> ○ Résumé ○ Supplementary information form ○ Transcript(s) • References <ul style="list-style-type: none"> ○ Number of references: 2 ○ Type of references: at least 1 academic • English language proficiency (ELP) (if applicable)
<h3>Degree requirements</h3> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses <ul style="list-style-type: none"> • Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department. 	<h3>Degree requirements</h3> <ul style="list-style-type: none"> • Graduate Academic Integrity Module (Graduate AIM) • Courses

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> • Students may register for any ECE course at the 600 or 700 levels. • A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Math and Science. • A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. • Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses. <p>Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations:</p> <ol style="list-style-type: none"> 1. Computer Networking and Security 2. Sustainable Energy <p>A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.</p> <p>All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 5 graduate (0.50 weight) level courses and this set is comprised of a mix of <i>compulsory</i> and <i>elective</i> courses. <i>Compulsory</i> courses are those that are prescribed as part of the Graduate Specialization. <i>Elective</i> courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.</p> <ol style="list-style-type: none"> 1. Graduate Specialization in Computer Networking and Security <ul style="list-style-type: none"> • To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses: <ul style="list-style-type: none"> ○ Compulsory courses: <ul style="list-style-type: none"> ▪ ECE 610 Broadband Communication Networks ▪ ECE 628 Computer Network Security ▪ ECE 655 Protocols, Software, and Issues in Mobile Systems ○ Elective courses (choose 2 from the following list): <ul style="list-style-type: none"> ▪ ECE 606 Algorithm Design and Analysis 	<ul style="list-style-type: none"> • Students must successfully complete 8 one-term courses (0.50 unit weight) acceptable for credit by the Department. • Students may register for any ECE course at the 600 or 700 levels. • A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Math and Science. • A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. • Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses. <p>Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations:</p> <ol style="list-style-type: none"> 1. <u>Artificial Intelligence and Machine Learning</u> 2. Computer Networking and Security 3. <u>Nanoelectronic Circuits and Systems</u> 4. Sustainable Energy <p>A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization.</p> <p>All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 5 graduate (0.50 weight) level courses and this set is comprised of a mix of <i>compulsory</i> and <i>elective</i> courses. <i>Compulsory</i> courses are those that are prescribed as part of the Graduate Specialization. <i>Elective</i> courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below.</p> <ol style="list-style-type: none"> 1. <u>Graduate Specialization in Artificial Intelligence and Machine Learning</u> <ul style="list-style-type: none"> • <u>To receive the Graduate Specialization in Artificial Intelligence and Machine Learning, students must successfully complete 2 compulsory courses and 3 elective courses:</u> <ul style="list-style-type: none"> ○ <u>Compulsory courses:</u> <ul style="list-style-type: none"> ▪ <u>ECE 657: Tools of Intelligent Systems Design</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<ul style="list-style-type: none"> ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 656 Database Systems ▪ ECE 657 Tools of Intelligent Systems Design ▪ ECE 659 Intelligent Sensors & Wireless Sensor Network ▪ ECE 715 Wireless Communication Networks ▪ ECE 716 Communication Security <p>2. Graduate Specialization in Sustainable Energy</p> <p>To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 2 compulsory courses and 3 elective courses:</p> <ol style="list-style-type: none"> 1. Compulsory courses: <ul style="list-style-type: none"> ○ ECE 663 Energy Processing ○ ECE 760 Topic-10: Operation and Control of Future Integrated Energy Systems 2. Elective courses (choose 3 from the following list): Note: not all elective courses may be offered each year. <ul style="list-style-type: none"> ○ ECE 661 HVDC and FACTS ○ ECE 662 Power System Analysis and Control ○ ECE 664 Power System Components and Modelling ○ ECE 665 High Voltage Engineering Applications ○ ECE 666 Power Systems Operation ○ ECE 667 Sustainable Distributed Power Generation ○ ECE 668 Distribution System Engineering ○ ECE 669 Dielectric Materials ○ ECE 768 Power System Quality ○ ECE 765 Power System Protection and Relaying 	<ul style="list-style-type: none"> ▪ <u>ECE 657A: Data and Knowledge Modelling and Analysis</u> ○ <u>Elective courses (choose 3 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ECE 602 Introduction to Optimization</u> ▪ <u>ECE 603 Statistical Signal Processing</u> ▪ <u>ECE 606 Algorithm Design and Analysis</u> ▪ <u>ECE 607 Fundamentals of Ultrasonics</u> ▪ <u>ECE 613 Image Processing and Visual Communication</u> ▪ <u>ECE 659 Intelligent Sensors and Sensor Networks</u> ▪ <u>ECE 700 Topic-7: Game Theory with Engineering Applications</u> ▪ <u>ECE 750 Topic-33: Artificial Life: Biology and Computation</u> ▪ <u>ECE 750 Topic-34: Artificial Life: Embodied Intelligence</u> ▪ <u>ECE 750 Topic-35: Applied Topics in Artificial Intelligence</u> ▪ <u>MSCI 718: Statistical Methods for Data Analytics</u> <p>2. Graduate Specialization in Computer Networking and Security</p> <ul style="list-style-type: none"> • To receive the Graduate Specialization in Computer Networking and Security, students must successfully complete 3 compulsory courses and 2 elective courses: <ul style="list-style-type: none"> ○ Compulsory courses: <ul style="list-style-type: none"> ▪ ECE 610 Broadband Communication Networks ▪ ECE 628 Computer Network Security ▪ ECE 655 Protocols, Software, and Issues in Mobile Systems ○ Elective courses (choose 2 from the following list): <ul style="list-style-type: none"> ▪ ECE 606 Algorithm Design and Analysis ▪ ECE 611 Digital Communications ▪ ECE 612 Information Theory ▪ ECE 656 Database Systems ▪ ECE 657 Tools of Intelligent Systems Design ▪ ECE 659 Intelligent Sensors & Wireless Sensor Network ▪ ECE 715 Wireless Communication Networks ▪ ECE 716 Communication Security <p>3. <u>Graduate Specialization in Nanoelectronic Circuits and Systems</u></p> <ul style="list-style-type: none"> • <u>To receive the Graduate Specialization in Nanoelectronic Circuits and Systems students, must successfully complete 1 compulsory project course (1.0 unit), and 5 elective courses:</u> <ul style="list-style-type: none"> ○ <u>Compulsory course:</u>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	<ul style="list-style-type: none"> ▪ <u>ECE 740 Topic-5: Nanoelectronic Circuits and Systems Project (1.0 unit)</u> ○ <u>Elective courses Set-A (choose 2 from the following list):</u> <ul style="list-style-type: none"> ▪ <u>ECE 621 Computer Organization</u> ▪ <u>ECE 627 Register-transfer-level Digital Systems</u> ▪ <u>ECE 630 Physics & Models Semiconductor Devices</u> ▪ <u>ECE 631 Microelectronic Processing Technology</u> ▪ <u>ECE 636 Advanced Analog Integrated Circuits</u> ▪ <u>ECE 637 Digital Integrated Circuits</u> ▪ <u>ECE 642 Radio Frequency IC Design</u> ▪ <u>ECE 671 Microwave & RF Engineering</u> ○ <u>Elective courses Set-B (choose 3 from the following list or from Set-A):</u> <ul style="list-style-type: none"> ▪ <u>ECE 606 Algorithm Design and Analysis</u> ▪ <u>ECE 638 CMOS Sensor Integrated Circuits</u> ▪ <u>ECE 730 Topic 9: VLSI Quality, Reliability and Yield Engineering</u> ▪ <u>ECE 730 Topic 16: Semiconductor Memories</u> ▪ <u>ECE 730 Topic 30: Advanced VLSI Devices</u> ▪ <u>ECE 738 VLSI Circuits for Wireless Communication</u> ▪ <u>ECE 740 Topic 3: CMOS Data Converters</u> ▪ <u>ECE 770 Topic 22: Wireless Radio Systems</u> <p>4. Graduate Specialization in Sustainable Energy</p> <ul style="list-style-type: none"> • To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 2 compulsory courses and 3 elective courses: <ul style="list-style-type: none"> ○ Compulsory courses: <ul style="list-style-type: none"> ▪ ECE 663 Energy Processing ▪ ECE 760 Topic-10: Operation and Control of Future Integrated Energy Systems ○ Elective courses (choose 3 from the following list): Note: not all elective courses may be offered each year. <ul style="list-style-type: none"> ▪ ECE 661 HVDC and FACTS ▪ ECE 662 Power System Analysis and Control ▪ ECE 664 Power System Components and Modelling ▪ ECE 665 High Voltage Engineering Applications ▪ ECE 666 Power Systems Operation

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
	<ul style="list-style-type: none"> ▪ ECE 667 Sustainable Distributed Power Generation ▪ ECE 668 Distribution System Engineering ▪ ECE 669 Dielectric Materials ▪ ECE 768 Power System Quality ▪ ECE 765 Power System Protection and Relaying

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

Students who were enrolled in the MEng in ECE program prior to Winter 2020 who complete the course requirements for one of the Graduate Specializations will be permitted to receive credentialization for the Graduate Specialization at the time of degree completion.

Students who were enrolled in the MEng in ECE program prior to Winter 2020 who meet the criteria for both a GDip and a Graduate Specialization cannot receive both credentials. They must select which credential they want to receive at the time of degree completion and inform the Department of their selection.

Departmental approval date (mm/dd/yy): 02/26/19

Reviewed by GSO (for GSO use only) date (mm/dd/yy): 03/6/2019

Faculty approval date (mm/dd/yy): 03/19/2019

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

Prior to form submission, review the [content revision instructions](#) and information regarding [major/minor modifications](#). For questions about the form submission, contact [Trevor Clews](#), Graduate Studies and Postdoctoral Affairs.

Faculty: Science

Programs: 1) Doctor of Philosophy (PhD) in Earth Sciences
 2) Master of Science (MSc) in Earth Sciences

Program contact name(s): Sue Fisher

Form completed by: Sue Fisher

Description of proposed changes:

Updating the current fields (areas of research) for the PhD and MSc programs.

Is this a [major modification](#) to the program? Yes

Rationale for change(s):

The addition of the new “Ecohydrology” field represents a new faculty (Canada Excellence Research chair) member in this area of research. “Solid Earth Sciences” is being changed to “Foundational Earth Sciences” as it better reflects the faculty. “Hydrogeology” is being changed to “Hydrogeology and Geophysics” as it provides better clarity for students. “Water Cycle Modelling” is being removed since it has been incorporated into all of the other field topics.

Proposed effective date: Term: Spring Year: 2019

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/science/department-earth-and-environmental-sciences/doctor-philosophy-phd-earth-sciences>

<https://uwaterloo.ca/graduate-studies-academic-calendar/science/department-earth-and-environmental-sciences/master-science-msc-earth-sciences>

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
<p>Fields (areas of research)</p> <ul style="list-style-type: none"> • Aqueous and Organic Hydrogeochemistry • Hydrogeology • Isotope Hydrology and Geochemistry • Solid Earth Sciences • Water Cycle Modelling 	<p>Fields (areas of research)</p> <ul style="list-style-type: none"> • Aqueous and Organic Hydrogeochemistry • <u>Ecohydrology</u> • <u>Foundational</u> Earth Sciences • Hydrogeology <u>and Geophysics</u> • Isotope Hydrology and Geochemistry

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

Current students will have the option of entering into the new/revised fields.

Section will expand to accommodate content. Please include details here.

Departmental approval date (mm/dd/yy): 10/11/2018

Reviewed by GSPA (for GSPA use only) date (mm/dd/yy):

Faculty approval date (mm/dd/yy):

Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate approval date (mm/dd/yy) (if applicable):

March 22, 2019

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

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

RE: Graduate Studies Academic Calendar changes

Items for approval:

1) Graduate student progress

Description and rationale for proposed changes:

Guidelines for evaluating and providing feedback on graduate student progress in PhD and research Masters programs and coursework programs have been developed to provide better clarity of expectations for students and faculty.

Proposed effective date: Term: Spring Year: 2019

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

<https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations>

Proposed Graduate Studies Academic Calendar content:

Guidelines for Evaluating and Providing Feedback on Graduate Student Progress in PhD and Research Masters Programs

Thorough and timely written feedback ensures that students know if their progress is satisfactory and also know, if it is not, how to get back on track. These guidelines are intended to help students, supervisors, Graduate Officers and Associate Deans evaluate and provide feedback on graduate students' progress through their programs.

Progress in a PhD or research Masters program constitutes successful and timely completion of some or all of the following:

- course work;
- comprehensive exams;
- language requirements
- thesis proposals;
- Major Research Papers (MRPs), theses and dissertations

Proposed Graduate Studies Academic Calendar content:

The University requires that an evaluation and feedback activity (as determined by the program) occurs at least once per academic year for a graduate student in a research program deemed to be making satisfactory progress and more frequently (as described below) for a student whose progress is not satisfactory. The two most commonly used mechanisms to conduct the evaluation and feedback are an “Activity report” or a “Committee Meeting”.

Activity Reports - To facilitate the assessment of the student’s work, the student shall provide a report that contains at a minimum an account of past achievements, and an outline of the work to be completed in the period between this and the subsequent submission. The Activity Report is reviewed by the supervisor (or co-supervisors) and the Graduate Officer, all of whom have the opportunity to comment. The Graduate Officer or Supervisor(s) determines an evaluation – an assessment of the student’s overall progress relative to expectations – which shall, at a minimum, indicate whether progress is deemed to be satisfactory or unsatisfactory.

Committee Meetings - Graduate students meet with their advisory committee including their supervisor(s) and summarize the students’ progress on their research and their program, again emphasizing past accomplishments and future activities. The committee determines an evaluation which shall indicate, at a minimum, satisfactory or unsatisfactory progress.

In all cases, the student’s overall rating and feedback on past work and future plans shall be reviewed by the student’s Graduate Officer and communicated to the student in writing. The level of detail on the written feedback shall be commensurate with the level of concern identified by the assessment. For example, students for whom progress is deemed to be excellent, may only need feedback that briefly acknowledges their past success and endorses their future plans. Should the evaluation be “Unsatisfactory,” the student must be informed as to the reasons for the concerns, actions that are to be taken to improve performance, and the timeline by which the necessary actions are to be completed. The comments (Activity Report or Committee Meeting Form) from the supervisor and/or the advisory committee should be detailed, reasonable and provide a timeline for completion.

Upon receipt of the evaluation, students also have the opportunity to comment. If the assessment of an Activity or Committee Report produces an Unsatisfactory evaluation, the student shall have the opportunity to meet with the evaluator(s) with the goal of providing additional information or context that may warrant a reconsideration of the assessment.

An Unsatisfactory rating should be an opportunity for the Graduate Officer and Supervisor (or Co-supervisors) to identify students who are struggling with their research due to health (including mental health), financial, writing or other challenges and provide direction to the student to appropriate campus resources (e.g. Campus Wellness, AccessAbility, The Writing and Communication Centre etc.). In these cases, Graduate Officers are encouraged to balance being an advocate for the student and also ensuring that program milestones are being met. If the evaluation remains as Unsatisfactory, and the student seeks to have the evaluation reconsidered, the student may proceed under Policy 70 with the Associate Dean, Graduate Studies in the Faculty.

If the concern is regarding performance in courses, particularly in the first term of graduate studies, students should be provided with the opportunity to improve their performance in a following term (when courses are offered).

In the case where a student receives an Unsatisfactory rating, the student will be placed on conditional status - the meaning of which is that the student is at risk of being required to withdraw if substantive improvements in performance are not observed. The student shall be given one to

Proposed Graduate Studies Academic Calendar content:

two additional terms (at the discretion of the Graduate Officer) to complete these requirements and return to satisfactory standing.

If progress on any subsequent assessment is deemed Unsatisfactory after receiving the first evaluation of Unsatisfactory, the Graduate Officer shall communicate a decision for the student to be required to withdraw from the program and no further funding will be provided. This letter (issued on letterhead) should specify the sequence of events that led to this decision. This letter will be reviewed by the Faculty Associate Dean, Graduate Studies prior to distribution to ensure that decisions are consistent within the Faculty. The Faculty Associate Dean, Graduate Studies and Associate Vice-President Graduate Studies and Postdoctoral Affairs must be copied on the final correspondence. A student may seek a petition or grievance for a Required to Withdraw decision according to Policy 70.

Guidelines for Evaluating and Providing Feedback on Graduate Student Progress in Coursework Programs

Non-research Masters programs are normally structured such that degree requirements consist primarily of completing a specified number of graduate level courses. These programs do not require students to conduct substantive research (such as a thesis); as such, these students do not have a research supervisor or an advisory committee. For students in these programs, progress is determined by the timely and successful completion of graduate courses.

The Graduate Officer in the student's home department is responsible for monitoring student progress. This includes reviewing student's registration status, the number of courses taken, as well as the performance in courses relative to articulated standards for the program.

If a student fails to meet the program's requirements, then the Graduate Office will carry out an academic review to determine if there exist Extenuating Circumstances that may have limited the student's ability to be successful. This review should be an opportunity for the Graduate Officer to identify students who are struggling with their academics due to health (including mental health), financial, or other challenges and provide direction to appropriate campus resources. If the review determines that no such conditions exist, then the student will be placed on conditional status and the Graduate Officer will convey that decision to the student in writing. This communication shall also contain an articulation of all conditions that the student must meet to return to satisfactory standing.

If there are serious concerns regarding performance in courses, whereby the grades are below a point where the average required for the program cannot be met, the Graduate Officer should recommend to the student that they voluntarily withdraw from the program. If the student decides to continue under conditional status for one additional term, they must do so with the understanding of the grades needed to achieve the necessary average required to remain in the program. If these are not met after the second term, then the student will, normally, be "required to withdraw" and communicated to as below.

If in the course of the program the student fails to meet the program requirements a second time, the Graduate Officer shall change the student's status to "required to withdraw" from the program. This decision will be communicated to the student in writing, specifying the sequence of events that has led to this outcome.

If the student seeks to have the "required to withdraw" reconsidered, they may file a petition or a grievance according to Policy 70 with the Associate Dean (Graduate Studies) for the Faculty. If the outcome is to permit the student to remain in the program, then the student will be placed on

Proposed Graduate Studies Academic Calendar content:

conditional status and the Associate Dean (Graduate Studies) will convey that decision to the student in writing and to clearly identify any conditions that the student must meet to clear conditional status.

Graduate Operations Committee approval date (mm/dd/yy): 03/19/2019

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

Senate Undergraduate Council met on 9 April 2019 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

CHANGES TO ACADEMIC PLANS

Faculty of Arts
Honours Arts Co-op

- 1. Motion:** To approve a change to Honours Arts to add a new entry stream, Honours Arts Co-op, effective 1 September 2020.

Background:

The requirements for this proposed stream are as follows:

Academic requirements (no change)

- 60% overall cumulative average
- the Faculty of Arts Bachelor of Arts Breadth Requirements
- the Communication Skills Requirement
- 20 academic course units (40 courses)
- minimum academic course units above the 100-level: 8.0
- plan-level (major) requirements

Co-op requirements (no change)

- minimum work-term units: 2.0
- minimum Professional Development (PD) units, including PD1 and PD12: 2.0
- minimum Work-term Report (WKRPT) units: 0.39

Study/work sequence

Current:

Plan	F	W	S	F	W	S	F	W	S	F	W	S	F	W
Arts and Business and the following department co-op plans: Economics, English (all majors), History	1A	1B	Off	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	4B
Departmental co-op plans: Political	1A	1B	Off	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	4B

Science, Psychology, Sociology														
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Proposed:

Plan	F	W	S	F	W	S	F	W	S	F	W	S	F	W
Arts and Business	1A	1B	Off	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	4B
Honours Arts co-op plans (excluding English majors)	1A	1B	Off	2A	2B	WT	3A	WT	3B	WT	4A	WT	WT	4B
Honours Arts co-op English majors	1A	1B	Off	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	4B

**Faculty of Arts
BA Co-op Plans**

- Motion:** Subject to approval of Motion 1, to approve the inactivation of departmental co-op plans and revisions to related notes and regulations as outlined below, effective 1 September 2020.

Rationale and Background:

The current text can be found at: <https://ugradcalendar.uwaterloo.ca/page/ARTS-BA-Co-op-Requirements>

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

...

BA Co-op Plans

The following BA co-op plans are offered:

Honours Arts and Business Co-op

The Arts and Business co-operative system of study combines an Honours plan in any Honours discipline in Arts (except Mathematical Economics and French Teaching Specialization; and plans offered by the School of Accounting) with the Arts and Business group of courses. The Arts and Business courses are intended to provide the student with a basic and practical general education and with skills appropriate to a wide range of careers. See the Arts and Business Co-op and Regular section and the appropriate discipline section for details.

~~Departmental~~ **Honours Arts Co-op**

Students may pursue the co-operative system of study with any BA Honours plan. See the individual Academic Plan sections of the Faculty of Arts section of this Calendar for specific academic plan average and course requirements.

- ~~Department of Economics: Honours Economics; Honours Mathematical Economics~~
- ~~Department of English Language and Literature: Honours English Literature; Honours English Literature and Rhetoric; or Honours English Rhetoric, Media, and Professional Communication~~
- ~~Department of History: Honours History~~
- ~~Department of Political Science: Honours Political Science~~
- ~~Department of Psychology: Honours Psychology~~

• ~~Department of Sociology and Legal Studies: Honours Sociology~~

The current text can be found by following the path: Academic Plans -> Honours major page

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

Honours Economics, English - Literature, English - Literature and Rhetoric, English - Rhetoric, Media, and Professional Communication, History, Political Science, Sociology

Continuation in this academic plan requires a cumulative minimum overall average of 60% and a cumulative minimum [*discipline*] major average of 70%. ~~Both regular and co-operative versions of this plan are available.~~

...

Honours Mathematical Economics

Continuation in this academic plan requires a cumulative minimum overall average of 60%, a cumulative minimum Economics average of 70%, and a cumulative minimum Mathematics average of 60%. ~~Both regular and co-operative versions of this plan are available.~~

...

Honours Psychology

Continuation in this academic plan requires a cumulative minimum overall average of 60% and a cumulative minimum Psychology major average of 70%. Conditional standing may be granted for one academic term to students whose averages fall below these criteria. ~~Both regular and co-operative versions of this plan are available.~~

The current text can be found at: <https://ugradcalendar.uwaterloo.ca/page/ARTS-Year-One-Bachelor-of-Arts-Students-1>

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

To be in satisfactory standing in ~~Honours or~~ General Arts Year One, a student must maintain:

- a minimum cumulative average of 65% in all Arts courses, and
- a minimum cumulative overall average of 60%.

To be in satisfactory standing in Honours Arts Year One, a student must maintain:

- **a minimum cumulative average of 70% in the potential major (end of 1B term), and**
- **a minimum cumulative overall average of 60%.**

To be in satisfactory standing in Honours Arts and Business (~~Co-op and Regular~~), a student must maintain:

- a minimum cumulative average of 70% in the potential major (end of 1B term), and
- a minimum cumulative average of 70% in the Arts and Business group of courses, and
- a minimum cumulative overall average of 60%.

...

**Faculty of Arts
French Studies**

- 3. Motion:** To approve the proposed changes to the French Teaching Specialization as outlined below, effective 1 September 2020.

The current text can be found at: <https://ugradcalendar.uwaterloo.ca/page/ARTS-Honours-French>

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

...

French Teaching Specialization

In combination with the Honours French plan-level requirements listed above, students interested in pursuing the French Teaching Specialization will be required to fulfil the following requirements:

- A minimum French major average of 75% (see Note 3).
- Successful completion of six additional courses, for a total of 11 academic course units (22 courses) in French or approved courses:
 - FR 203, FR 473
 - PSYCH 212/PSYCH 212R
 - SOC 207 or APPLS 205R
 - one additional FR course at the 300-level or above
 - one additional FR literature and culture course at the 300-level or above
- Completion of a total of 160 hours of in-school volunteer experience under supervision of certified teachers, from Year Two to Year Four, inclusively.
- ~~Students who do not already have native fluency in French are required to spend two consecutive terms (normally in Year Three) at one of the Department's French speaking university partners: either the Université du Québec à Chicoutimi (Canada) or the Université de Nantes (France).~~

...

Rationale and Background: The Department of French Studies wishes to remove the third year away requirement from the French Teaching Specialization (FTS) program. Under Plan Standardization, the mandatory third year away requirement is having a significant negative impact on enrollment in upper-level courses, as students are able to complete their degree requirements while abroad (students complete 8 FR course before leaving and usually take between 8-10 FR courses on exchange). This change aims to restore enrollments in upper-level courses and also to encourage recruitment into our MA program through contact with Waterloo professors in these courses. In addition, removing the mandatory away component will result in significant cost and time savings for both the department and the Faculty. Finally, the change will make the FTS program accessible to more students, as not all students are able to commit to two consecutive terms away. The Department notes that various one- or two-term exchange opportunities for students to attend French-speaking universities will continue to be available (e.g., MICEFA, ORA, UQAC); the third year away will simply not be mandatory for FTS students.

ACADEMIC REGULATION CHANGES

- 4. Motion:** To harmonize and centralize the regulations in the Undergraduate Calendar regarding the number of terms a student may be absent (not enrolled in courses) before that student will be required to submit an Application for Readmission.

Background and Rationale:

All Faculties have agreed to a three-term absence from studies timeline (Mathematics decreasing from five, Engineering increasing from two, the rest remaining the same), meaning that students, regardless of Faculty, will be required to submit an application for readmission after being absent (not enrolled in courses) for three consecutive academic terms. To reflect this in the Undergraduate Calendar, the following changes to the Undergraduate Calendar are proposed.

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

New Calendar page: (add link to the bottom of the list at: <http://ugradcalendar.uwaterloo.ca/group/uWaterloo-Policies-Guidelines-Academic-Regulations>.)

Absence from Studies

Students who have not enrolled in at least one course for three or more consecutive academic terms must apply for readmission to continue studies in their academic plan. Work terms are not academic terms.

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

Faculty	Page URL	Text to be removed/edited as indicated
Applied Health Sciences	http://ugradcalendar.uwaterloo.ca/page/AHS-Academic-Standing	To be removed completely: Students who have been inactive for three or more terms must apply for readmission to their plan. Note that work terms are not considered inactive terms.
Arts	http://ugradcalendar.uwaterloo.ca/page/ARTS-Admission-Application-Information	To be edited as follows: Readmission Current or former University of Waterloo students are required to submit an Application for Undergraduate Readmission Form if: <ul style="list-style-type: none"> • they have received a Failed - required to withdraw standing decision; • they were in satisfactory standing and resuming their studies in Arts following a voluntary absence of three academic terms or more (excluding co-op work terms); or • they have a voluntary absence from studies; • they are seeking to upgrade their undergraduate Arts degree; or • they are seeking another undergraduate degree (e.g., a second degree in a different discipline).
Engineering	http://ugradcalendar.uwaterloo.ca/page/ENG-Failure-to-Register	To be removed completely: If the absence exceeds one year, students will be required to apply for readmission in order to be considered for continuation in their program of study. See the Request to Complete Degree Requirements Following an Absence section of this Calendar.

<p>Mathematics</p>	<p>http://ugradcalendar.uwaterloo.ca/page/MATH-Math-Faculty-Policies</p>	<p>To be removed completely: Readmission A student who has completed at least one term of study and who has been inactive (i.e., not registered as a candidate for a Faculty of Mathematics degree or on an approved Letter of Permission) for at least five consecutive academic terms must apply for readmission.</p> <p>For example, a student whose last term of enrolment was spring 2016 would not need to apply for readmission if they returned to study in winter 2018 or earlier. However, if this student remained inactive until spring 2018 or later, then they would need to apply for readmission.</p> <p>Application for readmission must include a résumé covering the inactive period, and must include transcripts from any post secondary institutions attended in the interim. If the student is readmitted, Faculty policies in effect at the time of readmission will apply unless otherwise stated by the Faculty.</p>
<p>Science</p>	<p>http://ugradcalendar.uwaterloo.ca/page/SCI-Admissions-Application-for-Readmission</p>	<p>To be removed completely: The admission categories, requirements, and procedures are outlined in the Admissions section of this Calendar.</p> <p>Application for Readmission</p> <p>A student in good standing who does not register in any academic plan for more than a year must apply for readmission before returning to that academic plan.</p>

/rmw

Mario Coniglio
 Associate Vice-President, Academic

Report of the Vice-President, Research and International to Senate

May 2019

New Canada Excellence Research Chair

Katja Mombaur, Heidelberg University, Germany, was named a Canada Excellence Research Chair in Human-centred Robotics and Machine Learning. Mombaur's research program will focus on "motion intelligence," a particular kind of AI that incorporates understanding of human movement and anticipation of human actions. A mathematician as well as an engineer, she uses mathematical modeling to teach robots how to move and to design assistive devices, such as exoskeletons and prosthetic limbs, for the elderly and disabled. Mombaur will join the Faculty of Engineering in March 2020.

Faculty Achievements

Keith Hipel, Systems Design Engineering, was awarded a 2019 Killam Prize through the Canada Council for the Arts. Killam Prizes are presented annually to Canadian scholars in the humanities, social sciences, natural sciences, health sciences or engineering who have made significant contributions to their respective fields. With a focus of more than four decades in research on complex problems, particularly in water resources and the environment, Hipel was described by the council as "globally renowned" for his unique research on conflict resolution, multiple criteria decision analysis, time series modelling and other decision-making methodologies. He is the author of five books and almost 600 academic papers and conference articles. Hipel is an officer of the Order of Canada, former president of the Academy of Science within the Royal Society of Canada and the winner of several teaching awards.

Avery Broderick, Physics and Astronomy, played a key role in capturing first image of a black hole. Broderick developed the first theoretical models that accurately predicted what the images would look like and helped the Event Horizon Telescope (EHT) Collaboration interpret the historic images. Broderick also previously developed theoretical models that accurately predicted what the images would look like. The EHT links telescopes around the globe to form an Earth-sized virtual telescope with unprecedented sensitivity and resolution. The EHT is the result of years of international collaboration, and offers scientists a new way to study the most extreme objects in the Universe predicted by Einstein's theory of general relativity.

Linda Nazar, Chemistry and Chemical Engineering, was awarded the Chemical Institute of Canada (CIC) 2019 CIC Medal. According to the CIC website, "the CIC Medal is presented as a mark of distinction and recognition to a person who has made an outstanding contribution to the science of chemistry or chemical engineering in Canada." Nazar is an officer of the Order of Canada and holds the Canada Research Chair in Solid State Energy Materials.

Shannon Majowicz, School of Public Health and Health Systems has received \$280,176 to study the importance of food-safety interventions in developing countries. This research is part of a broader project, led by Professor Tine Hald, Technical University of Denmark, that will study foodborne diseases using a variety of approaches in African low-middle-income countries (LMICs). Together with researchers from the Kilimanjaro Clinical Research Institute, Haramaya University, Mountain Top University, Eduardo Mondlane University, University of Pretoria, and Otago University, Majowicz will conduct a population survey in four African LMIC partner countries that will shed insight on the incidence and mortality rate of major diarrheal and foodborne diseases.

Janusz Pawliszyn, Chemistry, and **Mark Servos**, Biology, received special recognition at the American Chemical Society (ACS) Annual Meeting for publishing one of the best papers of 2018 in “Environmental Science and Technology Letters.” The paper, titled “Metabolome Profiling of fish muscle tissue exposed to Benzo[a]pyrene using in vivo Solid-Phase Microextraction,” uses the novel analytical technique in vivo solid-phase microextraction to assess changes in biochemical pathways in living fish exposed to the environmental pollutant benzo[a]pyrene. This technique could be used as a powerful tool for direct monitoring of the toxicological effects of contaminants in living systems. Each year, the Board of Environmental Science and Technology Letters reads and ranks approximately 100 papers that the Associate Editors identified as exceptional contributions. Papers are selected based on the quality of the science, the impact of the findings, and the overall level of interest of their readers based on many factors including downloads, news stories, citations, and whether the paper was selected as an Editor’s Choice.

Waterloo Among Top Schools in the World for Social and Economic Impact

The University of Waterloo has been recognized for its social and economic impact related to its United Nations Sustainable Development Goals (SDGs) commitments. In its first-ever University Impact Rankings, the Times Higher Education measured the social and economic impact of over 500 universities from 75 countries related to their work on the SDGs. Out of the over 560 universities measured, Waterloo ranked fifth in climate action, ninth in sustainable cities and communities, 11th in partnerships for the goals, and shared the 13th spot overall. The rankings were announced during the Times Higher Education Impact and Innovation Summit in Daejeon, South Korea where the Waterloo Vice-President, Research and International participated on a panel on industry development and skills.