## OPEN SESSION

**3:30**

1. Conflict of Interest Declaration

**Consent Agenda**

**Motion:** To approve or receive for information by consent items 2-7 below.

2. Minutes of the 28 March 2016 Meeting Decision

3. Reports from Committees and Councils Information
   a. Graduate & Research Council Decision/Information
   b. Undergraduate Council

4. Report of the President Information
   a. Recognition and Commendation

5. Reports from the Faculties Information

6. Early Issuance of Degrees Information

7. Report of the COU Academic Colleague Information

## Regular Agenda

**3:35**

8. Business Arising from the Minutes Information
   a. UARC Supplementary Report

9. Presentations – Information
   a. Mark Haslett, University Librarian
   b. Chris Lolas, President, Federation of Students

10. Reports from Committees and Councils Information
    a. Executive Committee
       i. Bylaw 2 Amendment Second Reading
       ii. Elections to Senate Committees and Councils and to the Board of Governors Decision
    b. Graduate & Research Council Decision
    c. Undergraduate Council

11. Report of the President Information

**4:45**

12. Q&A Period with the President Information

**5:00**


**5:10**

14. Report of the Vice-President, University Research Information

**5:15**

15. New Degree Hood Decision

**5:25**

16. Other Business
<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>5:30</td>
<td>17. Conflict of Interest</td>
<td>Declaration</td>
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<tr>
<td>5:35</td>
<td>18. Minutes of the 28 March 2016 Meeting</td>
<td>Decision</td>
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<tr>
<td>5:40</td>
<td>19. Business Arising from the Minutes</td>
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8 April 2016

Logan Atkinson

University Secretary & General Counsel
OPEN SESSION

1. DECLARATIONS OF CONFLICT OF INTEREST
Senators were asked to declare any interests they may have in relation to the items on the agenda in open session. No conflicts were declared.

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

Ramdev and Kroeker.

2. MINUTES OF THE 22 FEBRUARY 2016 MEETING
Senate approved the minutes of the meeting.
3. **REPORTS FROM COMMITTEES AND COUNCILS**
   
   **Graduate & Research Council.**
   
   - **Academic Program Review Report (Fine Arts).** Senate approved the final assessment report for fine arts.
   - **Academic Program Review Report (Management Sciences).** Senate approved the final assessment report for management sciences.

   Senate received the remaining item in the report for information.

4. **REPORT OF THE PRESIDENT**
   
   **Recognition and Commendation.** 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.

**Regular Agenda**

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

7. **PRESENTATION**
   
   **MAYA D’ALESSIO, PRESIDENT, GRADUATE STUDENT ASSOCIATION (GSA)**
   
   **RACHEL MITCHELL, VICE-PRESIDENT, GRADUATE STUDENT ASSOCIATION**

   D’Alessio and Mitchell informed Senators about the activities and services of the Graduate Student Association generally, and in particular activities over the past twelve month period. D’Alessio made special reference to the need for improved graduate student space for both work and social uses. She also referred to: work currently underway to update Policy 30 on employment of graduate students; GSO/GSA town halls; the course evaluation project (with a suggestion to include the evaluation of teaching assistants); development of departmental culture for graduate students (essential to enhancement of the student experience). She expressed thanks to graduate student senators for their service.

   D’Alessio was asked about the priorities of the Ontario Graduate Student Association (OGSA). She advised that the OGSA has been focused on post-residency fees and a number of other issues of relevance to graduate students.

   Reference was made to the Graduate Studies Endowment Fund, not administered by the GSA but intended to assist with conference travel and related needs.


8. **REPORTS FROM COMMITTEES AND COUNCILS**
   
   **Amit and Meena Chakma Awards for Exceptional Teaching by a Student Committee**

   Senate received the report for information.

   **Distinguished Teacher Award Committee**

   Coniglio introduced winners of the Distinguished Teacher Awards, being Jee-Hae Lim (Accounting and Finance), Robert McKillop (Civil and Environmental Engineering), Katie Plaisance (Knowledge Integration), and Mark Pritzker (Chemical Engineering). Senators gave the recipients a round of applause. Hamdullahpur referred Senators to the complete report circulated with Senate materials.
Executive Committee.

Senate Bylaw 3, A bylaw to establish Committees and Councils of Senate of the University of Waterloo (1st reading). On the recommendation of Executive Committee, a proposed amendment to Bylaw 2 was read for the first time.

The proposed bylaw amendment is intended to provide clarity on the circumstances under which the powers of Senate may be exercised by Senate Executive Committee.

Finance Committee.

Speaking to his presentation, Orchard referenced the proposed 2016-2017 operating budget and the supplementary data set distributed with the agenda. He highlighted several items, including increases in tuition and provincial government policy in that respect; increases in operating expenses, including salaries and benefits; a projected deficit of approximately $2.1 million, $1.2 million of which is projected to be left over from the current budget; proposals on faculty hiring for the coming year; increases in student support.

Senate heard a motion to recommend that the Board of Governors approve the 2016-2017 Operating Budget as presented.

Orchard and Andrey.

In discussion, Orchard explained the concept of “tuition set aside,” an amount required by the province to be set aside from tuition to be returned to students in certain circumstances of need.

A question was raised with respect to increases in the numbers of faculty, administrative staff attached to academic units, and other administrative staff. It appears that the percentage of change in the non-academic support staff outside the Faculties is growing at a much larger rate than academic support staff and faculty. Orchard replied by saying that this will be scrutinized much more carefully as the new budget model is rolled out. In general, however, greater accountability frameworks and regulatory requirements means additional staff have been required to meet these demands. Further, non-academic support units have been chronically understaffed over the years, and as the University has grown those units have fallen further behind. Huber advised that we do track these issues, and for the most part we are about average in Canada for non-academic support staff and the rate of hiring in that respect.

Dixon addressed the issue of return on investment that the University generates through research commercialization projects in which the University has an interest. Recovery of the University’s investment does occur, but not necessarily in evidence on a year over year basis.

Orchard was asked how it is that we record an accumulated surplus of about $29 million, according to our audited financial statements for the year ended 30 April 2015. Huber advised that some of this is attributable to the fact that the statements are consolidated, including all funds under the University’s direction, as opposed to simply a calculation of operating revenues and expenses.

With respect to the library acquisitions budget, it is noted that the budget is constant over the current budget and the proposed budget, while other expenses are growing, and this is exacerbated by the current value of the Canadian dollar. The provost has an agreement with the Library to cover the currency differential with one-time money, rather than increasing the base.

The question was called, and the motion carried.

Graduate & Research Council.
Faculty of Engineering, Management Sciences. Senate heard a motion to approve a new Type II graduate diploma in data analytics.

Dixon and DeVidi. Carried.

Faculty of Engineering, Mechanical Engineering. Senate heard a motion to amend the masters of engineering plan in mechanical engineering.

Dixon and Parker. Carried

Faculty of Environment, Geography and Environmental Management. Senate heard a motion to add a part time option to the master of climate change plan.

Dixon and Andrey. Carried.

9. REPORT OF THE PRESIDENT
Hamdullahpur presented a short report on recent activities at the University, including: a visit from Mayor Tory of the City of Toronto in connection with the Waterloo/Toronto corridor concept; John Cherry, a distinguished professor emeritus in the University of Waterloo’s Faculty of Science, has been awarded the 2016 Lee Kuan Yew Water Prize, a top international water prize worth more than $280,000 CDN; attendance at the co-op students of the year ceremony; results in the QS discipline specific rankings; the recent provincial government budget, especially the concept of “free tuition;” establishment of the advanced manufacturing consortium with the University of Waterloo, Western and McMaster; the recent federal budget contained good news on the funding of the Tri-Council and infrastructure funding for the sector; allocation of funds for innovation networks and clusters, and a specific reference to the University of Waterloo in this announcement; speeches to various audiences about the value of a university education; trips to Singapore and China, and interactions with three different groups of University of Waterloo faculty at Chinese universities and the collaborations underway.

At the chair’s invitation, Diana Parry provided Senators with an update on the HeForShe campaign.

Slides used in Prof. Parry’s presentation may be seen at: https://uwaterloo.ca/secretariat-general-counsel/sites/ca.secretariat-general-counsel/files/uploads/files/heforshe.pdf.

10. Q&A PERIOD WITH THE PRESIDENT
In connection with the HeForShe campaign, Parry was asked about opportunity to have a positive impact at Velocity, which is not connected to a specific faculty. Parry advised that she has approached Mike Kirkup for a conversation on how Velocity might be better integrated into the program.

It was observed that students feel that they have been excluded from the program. Parry advised that there have been attempts to engage students, but more effort is needed to ensure that students are properly engaged. She was asked whether the gender equity targets are sufficiently high for an internationally respected University. The targets are intended to be achievable over a short five year period, they constitute a start and not a finish, and will be adjusted in future years.

A question was asked about the project in IST to move away from the ordinary UW email address for students, and it was indicated that there is significant discomfort among students on the question. Bruce Campbell, interim CIO, addressed the question, saying that IST would keep students engaged on the matter before any final decision is made. IST recognizes the value of the current domain name, and the mechanics for migrating are easily explained. Students will be engaged to work
through to a suitable solution. There are different considerations for the employee groups who will continue to use the current exchange environment, and needed improvements will be made as we go forward.

Slides for the president’s presentations on the value of a university education are available on the president’s office web site.

The president was asked about the integration of the proposed LRT station on campus with other modes of transportation. Huber advised that there have been discussions about this with Grand River Transit and with student representatives, and the conclusion is that the current plan will improve safety and integrate systems optimally, with a view first to the safety of users and others on campus. In response, there was further comment on the nature and extent of consultation, and whether student consultation is sufficiently meaningful on issues of importance to students.

Huber provided some further explanation of the positioning of pedestrian controls on the east and west sides of Ring Road.

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

University Professor Designations. The provost provided background to the designation and announced that Linda Nazar, chemistry has been awarded the honour this year.

Undergraduate Admissions Update. Darling presented a report on undergraduate admissions and graduate student applications for the coming cycle, advising on the numbers of offers that have been made to students in comparison to last year.


In response to a question, Darling advised that we are doing very well with retention rates at the undergraduate level, about 5th in Canada with respect to retention from first to second year. We do slip a bit in terms of graduation rates, and this needs more investigation to determine the causes.

12. REPORT OF THE VICE-PRESIDENT, UNIVERSITY RESEARCH

Senate received the report for information.

Under the “large and mid-size projects” portion of Dixon’s report, it was noted that funding of $1.02 million USD had been received by a University of Waterloo researcher from the United States Air Force. Dixon was asked whether such research partnerships are advisable. Dixon advised that if issues such as this are identified, ordinarily there will be a discussion during the course of settling the arrangement, but academic freedom must be respected as well.

13. OTHER BUSINESS

Orchard was asked if he would bring forward a report on the timetabling/scheduling project and the relationship with academic excellence and the student experience, and he agreed to do so.
Confidential minutes have been removed.
Senate Graduate & Research Council met on 7 March 2016, and agreed to forward the following items to Senate information. These items are recommended for inclusion in the consent agenda.

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

FOR INFORMATION

CURRICULAR MODIFICATIONS
On behalf of Senate, council reviewed and approved new courses, course changes, and minor plan changes for the Faculties of arts (accounting; Germanic & Slavic studies; sociology & legal studies), engineering (architecture; electrical & computer engineering), and mathematics (pure mathematics).

Migration to New Common Template for Graduate Studies Academic Calendar

In 2015, the Graduate Studies Office initiated a project to migrate the content of existing academic plans in the graduate calendar to a new common template, as well as a new web platform (WCMS). The aim of the project was to provide a common look and feel for all academic program calendar content that is robust and can fit the requirements and descriptions of every existing graduate academic plan. Prospective and current students as well as faculty and staff will benefit from clearer, more accurate and consistent program requirements, as well as more robust search functionality. Following outreach to the six faculties and the AFIW institutions, all units have subscribed to this approach and are adopting the common template over the course of early 2016.

At the 7 March 2016 meeting, council approved on behalf of Senate minor changes to the calendar text of academic plans for the Faculty of Engineering (Conrad Business, Entrepreneurship and Technology Centre; electrical and computer engineering; mechanical and mechatronics engineering) and the Faculty of Mathematics (applied mathematics; combinatorics and optimization; computational mathematics; master of mathematics for teachers).

SCHOLARSHIPS AND AWARDS
On behalf of Senate, council approved the creation of the Bruce Mitchell Graduate Scholarship, the T.H. Sze Memorial Award, and Neelanjana Pal Memorial Scholarship, and the Certificate in University Teaching Award.

Jim Frank
Associate Provost, Graduate Studies

George Dixon
Vice President, University Research
Senate Undergraduate Council met on 8 March 2016, and on behalf of Senate approved new courses, course changes, course inactivations, course reactivations, and minor plan changes. Council agreed to forward the following items to Senate for approval and for information. Council recommends that these items be included in the consent agenda.

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

FOR APPROVAL

CHANGES TO ACADEMIC PLAN

1. **Motion:** To approve changes to the option in computer engineering as described and effective 1 September 2017.

   Option in Computer Engineering

   This is a Designated Faculty Option which is available to students in Electrical Engineering and Systems Design Engineering to give greater training in software and to augment digital hardware capabilities. For details of this option students are referred to the Electrical Engineering and Systems Design Engineering sections of this calendar.

   **Rationale:** The number of electrical engineering students taking the option is limited. To improve symmetry in both programs, this option will no longer be available to electrical engineering students but will remain available to systems design engineering students.

FOR INFORMATION

CURRICULAR MODIFICATIONS

New courses, course changes, course inactivations, course reactivations, and minor plan changes were approved for the Faculties of arts (East Asian studies; religious studies; social development studies; studies in Islam), engineering (business, entrepreneurship and technology; complementary studies requirements; electrical and computer engineering; mechatronics), environment (geography & environmental management; environment, enterprise & development; environment, resources & sustainability; grade average regulations; international development; planning), mathematics (actuarial science; computer science, mathematics), science (chemistry, physics) and joint engineering and mathematics (software engineering).

ACADEMIC PROGRAM REVIEW REPORTS

1. Two-Year Report for anthropology (Attachment #1).
2. Two-Year Report for classical studies (Attachment #2).
3. Two-Year Report for East Asian studies (Attachment #3).
4. Two-Year Report for speech communication (Attachment #4).

Mario Coniglio
Associate Vice-President, Academic
Two Year Progress Report
Anthropology (BA)
January 2016

The Anthropology Department completed its assessment in 2011-2012 and the response to the external review was submitted to the Senate in March 2013. This report addresses the steps the department has undertaken since that time to respond to the seven recommendations suggested by the external review committee.

**Recommendation 1.** That course offerings at different year levels be streamlined to reflect the Public Issues Anthropology focus as outlined in the proposal brief of the University of Waterloo Masters in Public Issues in Anthropology.

**Status:** Done

**Details:** The Anthropology Department has completed a revision of the undergraduate plans, following the Faculty of Arts Plan Standardization. The new plans became active in Fall 2015. The requirements for the major were streamlined, and clearer sequences of courses in the three subfields of cultural, archaeological, and biological anthropology were developed. The course descriptions were revised to better reflect the Public Issues Anthropology focus that was initially developed for the graduate program.

**Recommendation 2.** That ANTH 101 and ANTH 102 be merged at the first-year level into one introductory level course that would provide a broad based introduction to anthropology and act as a springboard into the 200 level “Principles of...” offerings. The second year curriculum would then be composed of foundation courses in each of the three areas of program specialization where students will have the opportunity to experience the breadth and depth of each field and hone in on their particular interests. The thematic focus of third and fourth year level courses would build on the second year offerings, with particular attention to the defining theme of Public Issues Anthropology.

**Status:** Done
Details: ANTH 101 and ANTH 102 were merged into a single first-year course, ANTH 100, as of spring 2014. The second-year courses were streamlined, with three 200-level courses remaining as foundations courses in the three subfields of cultural, archaeological, and biological anthropology. The third and fourth year courses build on the second year offerings, expanding on the fields of expertise of the faculty and the theme of Public Issues Anthropology.

Recommendation 3. That the title and description of “Design of Anthropological Inquiry” (ANTH 300) to reflect its function as a methodologies course and to make it a required course for majors in Anthropology.

Status: Partially Done

Details: The title of ANTH 300 has been changed to “Practicing Anthropology.” However, in accord with the Faculty of Arts initiative to streamline major plans, it has not been made a required course for majors.

Recommendation 4. The review team recommends looking further into the possibility of cross-listing courses with other programs such as Geography so that students (particularly in the biological and archaeology streams) have greater access to training in, for example, GIS, and be able to count these courses as Anthropology credits towards their degrees.

Status: Considered and rejected

Details: As recommended, the department looked into the possibility of cross-listing courses in other programs such as geography. However, the lack of specifically anthropological content in these courses was of some concern. More importantly, the external pressure on the department to ensure high enrollments in upper level courses makes this recommendation impractical and potentially damaging to the department.

Recommendation 5. That a statement of learning objectives be mandatory for each course.

Status: Ongoing

Details: As courses are taught in rotation under the new undergraduate plans, statements of learning objectives are incorporated into the course syllabuses. These reflect the place of the course in the overall program of Anthropology undergraduate plans, and the theme of Public Issues Anthropology.

Recommendation 6. That the faculty complement be expanded with the addition of an anthropological archaeologist

Status: Done
Details: 
A new anthropological archaeologist was hired beginning 1 July 2014.

Recommendation 7. That the tenure-track cultural anthropologist seconded to another department be replaced.

Status: Done

Details: A new cultural anthropologist was hired in a joint position with Religious Studies beginning 1 July 2014.

Recommendation 8. That the Definite Term Instructor be renewed or replaced, ideally with a permanent position.

Status: Not done

Details: A search for a permanent replacement for the limited term instructor ended in a failed search. The position has not been renewed.

Recommendation 9. That the teaching load of the faculty be reduced to reflect more typical loads in the faculty of arts.

Status: Done

Details: Beginning in Fall 2013 the teaching load of all tenured and tenure track faculty was reduced to four courses.

Recommendation 10. That the tradition of faculty members offering independent reading courses to students be rethought and probably tightly regulated.

Status: Done

Details: The number of reading courses in the catalogue was reduced from three to one. Students are discouraged from taking reading courses, particularly in lieu of more formal course offerings. Faculty work with students to find ways they can explore their interests within the regular course offerings.
Recommendation 11: The review team recommends that the Anthropology Department abandon the attempt to run on a three-term cycle and instead offer courses in fall and winter, reserving summer for faculty research activities and experiential learning opportunities for students.

**Status:** Done

**Details:** The department has never attempted to run on a three-term cycle, and has always offered courses primarily in the fall and winter, reserving summer for faculty research activities and experiential learning opportunities for students. Other than field school, study abroad, and other experiential learning classes, courses offered in the spring term are normally taught only by sessional instructors, unless, in an exceptional case, the research schedule of a regular faculty member would facilitated by teaching in the spring term, leaving fall or winter for research.

Recommendation 12. That the Anthropology Co-op program be discontinued in favour of the Arts and Business Honours Anthropology Co-op program.

**Status:** Done

**Details:** As of Fall 2014 no students were enrolled in Anthropology Co-op. Arts and Business Co-op enrollments continue in small numbers.

Recommendation 13. That Distance Education be made a lower priority for the department, and only revived if additional faculty complement and other resources are provided.

**Status:** Done

**Details:** As of Fall 2013 the Anthropology Department no longer offer Distance Education courses.

Recommendation 14. That the department be provided with space to create a seminar room, a departmental lounge or gathering space, and that the current undergraduate Anth Society space be enlarged. In addition, the department should be provided with one more office bay, consisting of two faculty offices and one workroom.

**Status:** Not done
Details: No new space has been made available. Faculty, both full-time and sessional, now have offices in spaces formerly used for storage and workrooms. In addition, with the addition of the new Archaeological Anthropologist, the two biological anthropology teaching and research labs have been combined in order to provide lab space for the archaeologist. This has caused a considerable increase in the time required to completely set up and dismantle lab materials for biological anthropology courses on alternating days, and has severely restricted the use of the lab by students for research and hands-on learning.

Recommendation 15. That the retiring Department Administrative Assistant be replaced.

Status: done

Details: A new Administrative Assistant was hired beginning January 2014.

Respectfully submitted

Maria A. Liston, Chair, Anthropology Department
Two-Year Progress Report
Classical Studies (BA)
November, 2014

The self-study report for the Classical Studies programme was submitted in 2011 and the review conducted on 25–27 January 2012. The Department submitted an initial response to the recommendations of the reviewers, sent to the Associate Vice-President, on 18 July 2012. This report outlines the action taken in the past two years in response to these recommendations.

1) **Recommendation: The Department should move towards the implementation of a 4-course teaching load for full-time professorial-stream faculty.**

**Response:** As of 2013 the Department has adopted a 4-course teaching load for full-time professorial-stream faculty. We have been able to reduce the teaching load through the following consolidation of courses, as suggested by the reviewers:

a) consolidation of 1XX offerings by not running CLAS 104 (Classical Mythology) every semester but allowing higher enrollment when we do offer the course, thereby maintaining our dedication to this kind of service teaching. Given the continuing high demand for these courses, we have also in the past two years explored with the Faculty the creation of a continuing lecturer position to support our dedication to this teaching. It was suggested by the reviewers that we remove CLAS 103 (Colossos – Major Figures of Classical Antiquity) from the books. In practice we have not run this course since the adoption of a 4-course teaching load, but we have retained it on the books as a possible alternative to CLAS 104. Both these courses would not be run in the same year.

b) consolidation of upper-division and MA graduate courses, offering combined 3XX/4XX/6XX Greek and Latin language courses.

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1 This report was submitted in November 2014 and was misfiled, therefore, it missed timely consideration by Senate Undergraduate Council, and then Senate. A recent process audit caught this error in January 2016, thus explaining the late consideration of this report.
The reviewers also suggested renewing our commitment, already in place at that time, to collaborate with WLU for our undergraduate offerings. We had for a number of years shared upper-division undergraduate offerings with the Department of Archaeology and Classics at WLU. Unfortunately, due to changes and financial constraints within their own programme and profile, WLU has in the past two years not been able to collaborate with us as fully as in past, and we expect this collaboration to come to an end in this academic year (2014/15). Nonetheless, with the consolidations described above, we are now, whilst maintaining a 4-course teaching load, able to mount our undergraduate programme without the collaboration with WLU. We continue to serve WLU students who cannot get upper-division language courses at Laurier.

2) **Recommendation:** Department members should consolidate their outreach activities to support the advancement initiatives sponsored by the Waterloo Institute for Hellenistic Studies (WIHS).

**Response:** This is something that we were already doing at the time of the report and have continued to do. Not all of our outreach events support the advancement initiatives sponsored by the WIHS, as not all aspects of our programme are concerned with the Hellenistic period, but we work as synergistically as possible. These events do not constitute a drain on our department.

3) **Recommendation:** The Faculty should provide significant new funds in the form of student bursaries to support the Department’s ongoing commitment to the enhancement of student experience and the internationalization of its curriculum both through curricular offerings, e.g., in CLAS 390, and through extracurricular activities, e.g., participation in the International Congress on Medieval Studies held annually at Kalamazoo MI.

**Response:** In concert with the university’s commitment to international experience for our students, the Dean of Arts is currently, through a number of committees, exploring potential funding and enhancement opportunities and creating a strategic plan for student international experience. The Department has been active in these discussions. WIHS fundraising activities are also enhancing student international opportunities in the department: a fund for student travel to Greece established by Nick Aroutzidis (NA Engineering) now provides $1500 annually for student travel to Greece.
4) **Recommendation:** The Faculty and central Administration should support the program commitments and research aspirations of the Department by authorizing at least one new faculty appointment. The top priority is in the area of material culture (ancient art and archaeology).

**Response:** With current budget constraints there is no sign of a position being authorized in the near future.

5) **Recommendation:** The University should expand the space available to the Department and its associated Institute when the new Arts Building is built, either by expanding the Department’s space allocation in its current site or by moving the Department into the new Arts Building.

**Response:** A new Arts building has not been built and there are currently no firm future plans for this. We remain confident that increased space for the Department and for the Waterloo Institute for Hellenistic Studies will be found when the new Arts building is constructed.
Two Year Progress Report
East Asian Studies Program (EAS)
December 2015

The self-study for the East Asian Studies Program (EAS) was submitted on July 1, 2013. A site visit took place on November 7, 2013, and the review team submitted its report on November 29, 2013. The EAS program director submitted a response and an implementation plan, endorsed by the Principal of Renison University College, on February 27, 2014.

This two-year report outlines the progress to date with the implementation plan and the response to the review team’s recommendations to build the program’s strengths. The language programs continue to grow, and demand for courses is steadily increasing. The total enrollment in East Asian Studies language and culture courses for Fall 2015 is the highest it has ever been, with 1098 students registered (compared to 872 [2014], 916 [2013], 732 [2012] and 703 [2011]). In response, EAS has increased the number of lectures and tutorials to accommodate more students in language courses.

The reviewers made four recommendations after their visit in 2013.

**Recommendation 1:** Consolidate the program (“build our strength”) by making some teaching staff permanent and providing resources to enhance coordination of the program.

The following measures have been taken with respect to improving staffing:

- A new tenure-track faculty member in English has been cross-appointed to East Asian Studies because of his expertise in diaspora literatures of the area.
- Continuing and extended term contracts have been offered to four members of the teaching faculty who have been driving forces of the language programs as the language and/or program coordinators.
- Two formerly sessional lecturers were offered one-year contracts (from September 1, 2015 to August 31, 2016) to teach eight courses each within East Asian Studies.
- The working hours of the Administrative Assistant were increased from 20 to 35 hours/week as of September 2014, and the position title was renamed Advisor and Administrative Assistant in 2015, in consultation with Renison’s Human Resources Department.

**Recommendation 2:** Identify plans to increase space and teaching support as required (both for lectures and tutorials), particularly for accommodating student demand.
Office and teaching space have been increased to meet needs:
- A new Renison building opened in Spring 2015, doubling the number of classrooms available for teaching and providing much needed office space where EAS instructors can meet and work with students more privately.

**Recommendation 3:** Develop a unified plan for expanding the program beyond its current level in a specific area of focus (Socioeconomic? Cultural? Exchanges? Business?). Given the uniqueness the program has in offering Korean content, expansion of that component should be considered very seriously. Collaborative expansion capitalizing on other initiatives should also be considered.

The following steps and measures are being taken to develop a unified plan for expanding the East Asian Studies program:

- As indicated in our response to the recommendations in 2013, the expansion of the EAS program must address student demand as well as maintain integrity. The following courses have been added to the catalogue since 2013:
  - EASIA 231R – Calligraphy to Conceptual Art – effective Jan 1, 2015
  - EASIA 260R – Modern Chinese Literature (1917 - present day) – effective Jan 1, 2015 (renumbered to EASIA 361R effective Sept 1, 2016)
  - EASIA 291R – Special Topics in East Asian Studies – effective May 1, 2016
  - EASIA 302R – Chinese Foreign Policy since 1949 – effective Sept 1, 2015
  - EASIA 304R – Korean Law and Society – effective Jan 1, 2016
  - EASIA 362R – Introduction to Pre-Modern Japanese Literature – effective Jan 1, 2016
  - EASIA 363R – Introduction to Early Modern Japanese Literature – effective Jan 1, 2016
  - EASIA 377R – Cold War in East Asia – effective May 1, 2015
  - CHINA 391R – Special Topics – effective May 1, 2016
  - JAPAN 391R – Special Topics – effective May 1, 2016
  - KOREA 391R – Special Topics – effective May 1, 2016

- A student survey of current and former students in Spring 2015 showed strong interest in new course topics in the areas of culture, literature, and religion, findings confirmed by comparison with those of similar post-secondary programs worldwide. The survey results have led to the proposal for a new course cross-listed with Religious Studies entitled “Monsters and Magic in Japanese Popular Culture,” which is currently making its way through the approval process. Its effective date would be January 2017.

- An upper-year EASIA/ENGL course (EASIA 246R/ENGL 246R: Global Asian Diaspora) is being proposed to take advantage of the expertise of our new cross-appointed colleague. Its effective date would be May 2017.

- New special topics courses have been created to test the interest in focused courses in language and culture. The topic each term will be determined according to the expertise and subject area available at the time. For example, a special topics course in Korean pop culture will be offered in Fall 2016. One of the recommendations in the review
identified the potential for expansion of the Korean component. In addition to exploring emerging opportunities for funding, (e.g. from the Korea Foundation or the King Sejong Institute), advanced courses in Korean language, KOREA 301R (Third-Year Korean 1) and KOREA 302R (Third-Year Korean 2) will be proposed in Winter 2016 to allow students to earn a second-level certificate in Korean Language Studies in line with certificates offered in Japanese and Chinese languages. The proposed courses will also allow non-degree and post-degree students to earn the Diploma in Korean Language. Effective dates for the new certificate and diploma would be September 2017.

**Recommendation 4:** After all of the above and only then, consider what it will take to change this into a major program.

The Spring 2015 survey posed the question of interest in a major for past and current students, who responded positively. Changes in the structure of the minor are currently being considered at the program level to provide focus and help the program determine its future. Funding opportunities are being assessed, and consultation with concerned parties (i.e. EAS faculty members and Renison senior administration) is continuing in order to determine whether solid support exists for developing the infrastructure and courses required for a major program.

**Conclusions**

EAS has made substantial progress in responding to the recommendations of the 2013 Program Review Report. Demand for EAS courses is high and continues to grow.

Despite its small size, East Asian Studies continues to enjoy a high profile, both within the university and within the greater community; it contributes significantly to internationalization initiatives both at Renison and at Waterloo. Tenured faculty members maintain a strong presence in terms of international research and publications (reputable books, prestigious grants, invited talks, government consultations etc.).

At the same time, the program continues to add to its reputation in language education as exemplified by exceptional results at various speech contests. In 2015, our students won first place in the beginner, intermediate, and advanced categories at both the Ontario and Canadian National Japanese speech contests. Also in 2015, one of our students was awarded the Grand Prize at the International Korean speech contest hosted by the King Sejong Institute in Seoul. In the meantime, our Chinese language students have won first place four times at the Ontario Provincial University Student Chinese Competition since Renison started participating.

In terms of the timeline presented in response to the program reviewers’ report (see attached), the EAS program is clearly on track in attending to the recommendations.
<table>
<thead>
<tr>
<th>Timeline</th>
<th>Recommendations</th>
<th>Responsibility</th>
<th>Resources Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2014</td>
<td>Consolidate the program (“build our strength”) by making long/definite-term contracts with some teaching staff and providing additional resources for program coordination</td>
<td>• Director</td>
<td>• Admin Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Renison Principal</td>
<td>• Funding for additional staff work hours</td>
</tr>
<tr>
<td>2014-2015</td>
<td>Identify plans to increase space and teaching support as required (both for lectures and tutorials), particularly for accommodating student demand</td>
<td>• Director</td>
<td>• Space availability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Renison Principal</td>
<td>• Funding for additional hires and increased teaching hours</td>
</tr>
<tr>
<td>2014-2017</td>
<td>Develop a unified plan for expanding the program beyond its current level in a specific area of focus (Socioeconomic? Cultural? Exchanges? Business?). Given the uniqueness the program has in offering Korean content, expansion of that component should be considered very seriously. Collaborative expansion capitalizing on other initiatives should also be considered</td>
<td>• Director</td>
<td>• Admin Support</td>
</tr>
<tr>
<td>2016-2018</td>
<td>After all of the above and only then, consider what it will take to change this into a major program</td>
<td>• Director</td>
<td>• Admin Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Funding for additional hires</td>
</tr>
</tbody>
</table>
Two-Year Progress Report
Speech Communication Program (BA)
December 2015

The below report summarizes:

• actions taken since submission of the program report;
• recommendations not acted upon, but for which action is planned;
• recommendations no longer considered appropriate;
• new ideas or initiatives, not included in the report; and
• other relevant information.

This report was prepared under the direction of the Acting Chair with input from faculty members in the Speech Communication program.

Action taken since submission of the program report:

The Speech Communication program report was submitted in March of 2013. The report was prepared by Michael Dorland, School of Journalism and Communication, Carleton University, and Thomas K. Nakayama, College of Arts, Media and Design, Northeastern University

Since that time, the following actions have been taken:

• Recommendation two, increase the faculty by two positions.

In the past two year period, the Speech Communication program has hired three tenured or tenure-line faculty, and two definite term lecturers (one for a three-year term, and the other for a one-year term). In part, these hires were a response to concerns raised in the program review, which strongly recommended that two full-time faculty positions be hired, and in part these positions have been created because Speech Communication was invited to play a role in the university wide English Language Competency Initiative, and specifically provide SpCom courses to Math Faculty students. The hiring of these five faculty partially achieves the report’s recommendation, as these positions are in part shared with the larger English Language Competency initiative. The need for new faculty in Speech Communication is still a concern, as the unit is still experiencing pressure to teach an increasing number of students, both within
the Faculty of Arts (e.g.: SpCom 111 to Accounting students), and because the SpCom courses
offered to the Math Faculty (SpCom 100, 223, 225, 227, and 228) are over-subscribed.
Currently, the department relies on five active tenure line faculty members in a program with
approximately 160 majors. A sixth tenure line faculty member in the program is currently on
leave with an unspecified return date, a situation over which neither the department nor the
Faculty of Arts has any control.

- **Recommendation three, ensure slow and controlled growth for the program.**

With the increased number of faculty have also come additional requirements such as providing
SpCom courses to the Math Faculty through the English Language Competency initiative; so, in
the past two years there has been a continual effort to manage growth and change well.
Students in the Faculty of Arts show interest in the program, suggesting a strong potential
for further growth in enrollment. However, the current level of resources, and especially the lack of
office and meeting space in the Modern Languages building, does not support such growth. It is
also worth noting that curricular changes approved at the Undergraduate Advisory Group and
implemented over the past two years have served to attract new students into the major.

- **Recommendation four, related to growth of the Speech Communication program and
courses outside of the department (i.e., that in other departments in the Faculty of Arts
and in other faculties), centrally involve those in the Speech Communication program in
this growth.**

See above (outline and rationale, recommendation three). The program’s offerings are popular
in other faculties as well as within the Faculty of Arts. Speech Communication has seen marked
increases in student majors over the past two years, and this is consistent with the trend of
higher enrollments in communication programs in the United States and in Canada. As noted
above, such growth requires resources. Further, by strongly linking growth plans to wider
efforts, such as the English Language Competency initiative, the outcomes will benefit the
program, department, faculty, and university.

- **Recommendation five, further integrate Dr. Shannon Hartling and Mr. Tim Paci into work
of program and department.**

In 2013, shortly after the program report, Dr. Hartling and Mr. Paci’s contracts with the
university changed from Definite Term lecturers to that of Continuing Term Lecturers. Dr.
Hartling and Mr. Paci play an important role in, and make significant contributions to, the
Speech Communication program, and are fully integrated into program meetings and practices.
Over the past two years, Mr. Paci and Dr. Hartling have made significant contributions to the
program in the areas of Service, and given their in-depth knowledge of and familiarity with the
program, this contribution has been welcome and necessary. With the increase of new faculty in Speech Communication, Mr. Paci and Dr. Hartling have provided an important resource of knowledge and understanding; however, their role in the development of curriculum and other service commitments could be enhanced and supported with contracts that would allow for a greater percentage of their time spent in service (e.g.: reduced teaching and increased service for a specific period of time, with specific service areas identified).

- **Recommendation six, within the department as a whole, continue integrating three disciplinary programs (i.e., Speech Communication, Drama, and Digital Arts Communication).**

In keeping with departmental conversations and priorities, over the past two years, the Speech Communication program has considered and implemented various initiatives that explore the possibilities for cross-program work within the department, related to teaching, research, and service. In fall 2013, the department held a department wide and program specific orientation event for students, which brought all students in the department together. Given existing resources, faculty in the Speech Communication program have engaged in further integration with faculty in the two other units when it supports a) the work of the department overall; b) the efforts of the Speech Communication program as a whole; and/or c) the research and teaching of the individual faculty member. An example of such an initiative happened in the winter term of 2014: entitled *Small Acts of Repair Toward Mental Health: Information and Conversation*. This was a symposium co-directed by Andy Houston (Drama) with Jennifer Simpson (SpCom), to work in support of the Drama unit’s term production, entitled *From Solitary to Solidarity: Unraveling the Ligatures of Ashley Smith*. This symposium included invited experts to speak about mental health issues and mental health awareness at the University of Waterloo and in the broader Waterloo region. It brought together a number of stakeholders who work in various capacities toward the promotion of mental health awareness, including faculty from across the University of Waterloo, and the Director of Counseling Services on campus.

Also, in the fall term of 2014, a Collaboration Committee was established with the mandate to investigate ways in which the three programs of our department can better work together, including the development of joint curriculum and joint research initiatives. An example of the latter is Dr. Jill Tomasson Goodwin’s LITE Seed grant, entitled *Learning Innovation and Teaching Enhancement*, which includes representation from all three programs in the department.

- **Recommendation seven, recognize the potential the Speech Communication program holds in regard to Faculty of Arts enrollments.**
Please see the responses to recommendation three and four. In their report, reviewers stated that the Speech Communication program “has an enormous potential contribution to make to the Faculty of Arts and to Waterloo University [...] has the potential to increase (or stop the declining) enrollments in the Faculty of Arts.” Faculty in the program agree that through intentional and strategic efforts, the Speech Communication program may well be able to contribute to marked growth and retention in both the program itself and in the Faculty of Arts more widely. These efforts and their consequences would clearly have relevance to the university, and also require additional resources. In the past two years, the Speech Communication program has demonstrated a willingness to serve, both at the faculty level, toward better communication capacity, and at the university level, through initiatives such as the English Language Competency initiative. The Speech Communication program has also developed various initiatives to better communicate its curriculum and pedagogical strengths to potential students, for example:

- **Website redesign.** A departmental subcommittee, active in the last two years has substantively redesigned the departmental website. These efforts resulted in significantly updated and improved Speech Communication program pages, as well as improvements to the overall site.
- **Elimination of courses no longer offered.** Faculty have identified courses that are no longer offered in the Speech Communication program, and these courses have been deleted from the university calendar.

**Recommendations not acted upon, but for which action is planned:**

- **Recommendation one, change the name of the Speech Communication program.** In the 2013 report, the reviewers noted that the name of “Speech Communication” can lead to confusion, and does not necessarily represent the breadth of the Speech Communication program. The unit responded to this concern, stating: “The Speech Communication program at the University of Waterloo is closely aligned with disciplinary traditions and trajectories in the United States, and is quite different from nearly all communication programs in Canada. The Communication program at Cape Breton University is the only one in Canada that parallels the program at UW (in terms of disciplinary focus and related to scholarly and pedagogical areas of study). The name of “Speech Communication” in a disciplinary sense conveys very well the program’s intellectual priorities and scope, and clearly distinguishes the program from others in Canada.” The unit has discussed the possibility of a name change in several meetings in 2015, and by the end of the year a sub-committee was formed to research the possibilities and make a recommendation to the unit in 2016.
Recommendation five, further integrate Dr. Shannon Hartling and Mr. Tim Paci into work of program and department. The reviewers’ report states that both Dr. Hartling and Mr. Paci might be given more research time. Dr. Hartling and Mr. Paci each have a contractual teaching load of eight courses annually, with an appointment of 80% teaching and 20% service and no allowance for research.

Recommendations no longer considered appropriate:

Not applicable.

New ideas or initiatives, not included in the report:

In 2014, Speech Communication, along with the Department of English, St. Jerome’s College, and the EMLS program at Renison College undertook an initiative to design, deliver, and manage communication and writing courses for the Faculty of Math. Within the Speech Communication program, SpCom 100, 223 (a first level of courses) as well as 225, 227, and 228 (a second level of courses) have been offered to Math students through a designation self-placement process. As of the time of writing this report, this initiative has enjoyed three terms of success in that our courses are popular with Math students keen to improve their communication skills, the designated self-placement process has worked well, and preliminary reports show improved performance of Math students who have taken SpCom courses in their Co-op placements.

Moving forward, three areas of concern have been identified with respect to the Faculty of Math initiative: First, processes and roles regarding the design and delivery of these courses needs to be clarified. Second, an evaluation and assessment of how our resources are being used should happen, and a decision made about whether the program has the appropriate resources for the size and complexity of this initiative. And third, questions about assessment of both the program and individual courses have recently come to the fore.

In relationship with the above initiative, Speech Communication faculty (Jennifer Simpson and Shana MacDonald) serve on SCLECI (Steering Committee, English Language Competency Initiative). Members of SCLECI are interested in the development of a program assessment working plan that supports the successful implementation of the foundational outcomes passed by Dean’s Council in May 2015.
Other relevant information:

In the past two years, Speech Communication courses have proven to be popular with students across the university. The popularity is beginning to translate into higher enrolment numbers in first and second year courses, and the need to employ a greater number of sessional instructors. This is putting pressure on the department and the program’s resources.
FOR INFORMATION

Recognition and Commendation

Seven researchers at the University of Waterloo are receiving more than $3.9 million to collaborate with Canadian-based companies and government organizations on strategic research projects. The funding for Strategic Partnership Grants announced 2 March 2016 by the Natural Sciences and Engineering Research Council of Canada (NSERC) helps bring expertise from academia and industry together to collaborate on research that will lead to innovation and commercialization. Waterloo has a long history and reputation for successful industry partnerships, and was ranked second in Canada for collaboration with industry by the CWTS Leiden Ranking 2015. The researchers who will receive funding through Strategic Partnership Grants are:

- **Professor Slim Boumaiza** (Electrical and Computer Engineering) with BlackBerry Ltd. and Skyworks Solutions Inc: Digitally-assisted analog/RF circuits for enhancing the performance of 5G millimeter-wave massive MIMO transceivers ($581,844).
- **Professor Jean Duhamel** (Chemistry) with EcoSynthetix: Hydrophobically modified thermo-responsive starch nanoparticles for use in oil recovery of oil sands ($574,220).
- **Professor Karim S. Karim** (Electrical and Computer Engineering) with Teledyne DALSA: High resolution, hard X-ray digital imagers for non-destructive testing applications ($597,000).
- **Professor Hyung-Sool Lee** (Civil and Environmental Engineering) with AMEC Foster Wheeler: Innovative technologies for controlling dissolved methane and nitrogen in anaerobic wastewater treatment ($567,300).
- **Professor John Long** (Electrical and Computer Engineering) with Sidense Corp. and Skyworks Solutions Inc: 2D material thin-film transistors and components for RF/mixed-signal applications ($633,613).
- **Professor Sriram Narasimhan** (Civil and Environmental Engineering) with the City of Guelph, C3Water, Terapel Corporation, Toronto Water and Eramosa Engineering Inc: A novel monitoring and decision support system to manage water loss in urban water distribution systems ($503,448).
- **Professor Aiping Yu** (Chemical Engineering) with Grafoid Inc. and Microbonds Inc: Advanced graphene fiber based wearable supercapacitor ($450,000). (Daily Bulletin, 2 March, 2016)

The Board of Governors of St. Jerome’s University has announced that Katherine Bergman has been re-appointed to a second term as President and Vice Chancellor of St. Jerome’s University. “Under Professor Bergman’s leadership the University has seen unprecedented infrastructure renewal, and is in the midst of an active and successful fundraising campaign,” says the official announcement. “We are delighted that Dr. Bergman has accepted a second term as President of St. Jerome’s University,” said Cathy Horgan, chair of St. Jerome’s Board of Governors. “Her proven leadership skills and sound vision will lead us into the future as a premier Catholic university.” Bergman is an avid volunteer, building community partnerships and active in both the Rotary and with KidsAbility. She is the seventh President and Vice Chancellor at the University. (Daily Bulletin, 8 March, 2016)

An easy-to-use system that enables farmers to reduce agricultural water waste through real-time data cleaned up at this year’s Canadian Engineering Competition held at McGill University March 4-6. Designed by five electrical and computer engineering students, Project Reservoir is an agricultural water control and environmental monitoring system consisting of low-cost field sensors which collect real-time soil and environmental conditions. **Ryan Gibson, Austin Cousineau, Ian Murray, Stuart Alldritt** and **Nicole Jiang** won first place in the Innovative Design Competition, the W. R. Petri Engineering Design Award for Technical Excellence, and the CEC Award for Outstanding Environmental Awareness. Project Reservoir is a recipient of funding from the Engineer of the Future Trust. Second place in the Innovative Design Competition went to fourth-year Waterloo nanotechnology engineering students **Wenbo Cui, Stuart Murray, Laura Bahlmann** and **Eric Beauregard** for GraFET. The sensor uses a graphene based transistor and a dipole detection method to quickly detect toxic gases. (Engineering News, 7 March 2016)
A. APPOINTMENTS/REAPPOINTMENTS

Probationary Term

BARNETT-COWAN, Michael, Assistant Professor, Department of Kinesiology, July 1, 2016 – June 30, 2019. BA Honours, University of Guelph, 2002; MA, York University, 2005; PhD, York University, 2009.

BERBARY, Lisbeth, Assistant Professor, Department of Recreation and Leisure Studies, July 1, 2016 – June 30, 2019. BA, Ithaca College, 2001; Masters in Science in Recreation, State University of New York at Cortland, 2003; Graduate Certificate in Women’s Studies, University of Georgia, 2006; Graduate Certificate in Interdisciplinary Qualitative Studies, University of Georgia, 2008; PhD in Leisure Studies, University of Georgia, 2008.

KIRKPATRICK, Sharon, Assistant Professor, School of Public Health and Health Systems, July 1, 2016 – June 30, 2019. B. Kin McMaster University, 1996; BASc (Honours), University of Guelph, 2000; MSc, University of Toronto, 2002; PhD, University of Toronto, 2008.

LAIRD, Brian, Assistant Professor, School of Public Health and Health Systems, July 1, 2016 – June 30, 2019. B.Sc. (Hon), University of Guelph, 2005; PhD, University of Saskatchewan, 2010.

MEYER, Samantha, Assistant Professor, School of Public Health and Health Systems, July 1, 2016 – June 30, 2019. BA (Honours), McMaster University, 2006; PhD, Flinders University, Australia, 2011.

MISENER, Katherine, Assistant Professor, Department of Recreation and Leisure Studies, July 1, 2016 – June 30, 2019. B. Kin (Honours), McMaster University, 2003; M.H.K, University of Windsor, 2005; Ph.D., University of Western Ontario, 2009; Post-doctoral Fellow, Ryerson University, Centre for Voluntary Sector Studies, Ted Rogers School of Management, 2012.

Definite Term Research Appointment

YAZDANI, Amin, Research Assistant Professor, Department of Kinesiology, March 1, 2016 – February 28, 2018.

Definite Term Research Reappointment

CAMPBELL, Sharon, Associate Professor, School of Public Health and Health Systems, Propel Centre, June 1, 2016 – September 30, 2016.

Adjunct Appointments

Graduate Supervision and Research

BERG, Katherine, Associate Professor, Department of Kinesiology, April 1, 2016 – December 31, 2017.

CHAUDHURY, Habib, Professor, Department of Kinesiology, February 1, 2016 – December 31, 2017.
GONIEWICZ, Maciej, Assistant Professor, School of Public Health and Health Systems, April 1, 2016 – April 30, 2018.

NEITERMAN, Elena, Assistant Professor, School of Public Health and Health Systems, February 22, 2016 – June 30, 2020.

Adjunct Reappointments
Graduate Supervision
McKAY, Bruce, Associate Professor, School of Public Health and Health Systems, June 1, 2016 – December 31, 2020.

ROBERTSON-WILSON, Jennifer, Associate Professor, School of Public Health and Health Systems, May 1, 2016 – December 31, 2017.

Special Appointments
SCHUMILAS, Theresa, Lecturer, School of Public Health and Health Systems, May 1, 2016 – August 31, 2016.

SERAFINI, Toni, Associate Professor, School of Public Health and Health Systems, June 1, 2016 – August 31, 2016.

B. SABBATICALS

ALREADY APPROVED BY THE BOARD OF GOVERNORS
BERBARY, Lisbeth, Assistant Professor, Department of Recreation and Leisure Studies, July 1, 2016 – December 31, 2016 “special early” six month leave at 100% salary.

FOR APPROVAL BY THE BOARD OF GOVERNORS
HAVITZ, Mark, Professor, Department of Recreation and Leisure Studies, July 1, 2016 – December 31, 2016, “early” six month leave at full salary, administrative leave, January 1, 2017 – April 30, 2017 at full salary.

MCCARVILLE, Ronald, Department of Recreation and Leisure Studies, July 1, 2016 – June 30, 2017, 1 year at full salary, administrative leave, July 1, 2017 – October 31, 2017 at full salary.

MISENER, Katie, Department of Recreation and Leisure Studies, July 1, 2016 – December 31, 2016, “early” six month leave at full salary.

James W.E. Rush, Dean
Faculty of Applied Health Sciences
FOR INFORMATION

A. APPOINTMENTS

Tenure
RIDDELL, Chris (BA 1996 University of British Columbia, MA 1997 McMaster University 1997, PhD 2004 University of Toronto), Associate Professor, Department of Economics, effective July 1, 2016. Dr. Riddell comes to Waterloo from the ILR School, Cornell University. He has developed a strong reputation for his research in labour economics and industrial relations. He is Editor-in-Chief of the journal *Industrial Relations*. His expertise in empirical methods will benefit our undergraduate and graduate programs alike. Dr. Riddell complements the growing expertise in the Department of Economics in labour market research.

Tenure – Change in Date
SZEMAN, Imre, Professor, Department of English Language & Literature, from July 1, 2016 to January 1, 2017.

Probationary Term Appointments - Change in Dates
BERGSIEKER, Hilary, Assistant Professor, Department of Psychology, from July 1, 2015 to June 30, 2018 to July 1, 2015 to June 30, 2019.

Definite Term Reappointments
ABD-elrazak, Loula, Assistant Professor, Department of French Studies, September 1, 2016 to August 31, 2019.

GEORGE, Ryan, Lecturer, Department of Economics, September 1, 2016 to August 31, 2017.

B. ADMINISTRATIVE APPOINTMENTS

Administrative Appointments
COOPER, Tara, Associate Chair, Graduate Studies, Department of Fine Arts, July 1, 2016 to June 30, 2018.

ESSELMENT, Anna, Associate Chair, Undergraduate Studies, Department of Political Science, January 1, 2016 to June 30, 2019.

PARÉ, François, Associate Chair, Graduate Studies, Department of French Studies, January 1, 2016 to December 31, 2016.

VIDEKANIC, Bojana, Associate Chair, Undergraduate Studies, Department of Fine Arts, July 1, 2016 to June 30, 2018.

Administrative Reappointment
BUSCH, Lutz-Alexander, Associate Chair, Undergraduate Studies, Department of Economics, September 1, 2016 to June 30, 2018.

SILLATO, Maria Del Carmen, Associate Chair, Undergraduate Studies, Department of Spanish and Latin American Studies, May 1, 2016 to April 30, 2017.
C.  RESIGNATIONS
SNYDER, Emily, Lecturer, Department of Sociology & Legal Studies, effective April 30, 2016.

WHITE, Stephanie, Lecturer, Department of English Language & Literature, effective April 17, 2016.

D.  SABBATICAL LEAVES
For approval by the Board of Governors:
CHESNEY, Bill, Associate Professor, Department of Drama & Speech Communication, September 1, 2016 to August 31, 2017, twelve months at full salary.

DUSAILLANT-FERNANDES, Valérie, Assistant Professor, Department of French Studies, July 1, 2016 to December 31, 2016, six months at full salary.

EASTON, Fraser, Associate Professor, Department of English Language & Literature, July 1, 2016 to June 30, 2017, twelve months at full salary.

LIM, Jee-Hae, Associate Professor, School of Accounting & Finance, September 1, 2016 to February 28, 2017, six months at full salary.

LISTON, Maria, Associate Professor, Department of Anthropology, July 1, 2016 to June 30, 2017, twelve months at 85% salary.

PORRECA, David, Associate Professor, Department of Classical Studies, July 1, 2016 to December 31, 2016 and July 1, 2017 to December 31, 2017, twelve months at full salary.

THOMPSON, Jessica, Assistant Professor, Department of Fine Arts, January 1, 2017 to June 30, 2017, six months at full salary.

Douglas M. Peers
Dean, Faculty of Arts
UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF ENGINEERING - SENATE
April 18, 2016

FOR INFORMATION

A. APPOINTMENTS

Definite Term Reappointment – full-time
BOGHAERT, Eline, Lecturer, Department of Chemical Engineering, August 31, 2016 – August 29, 2018.

Visiting Appointments
CHEN, Xiaoming, Scholar, Department of Mechanical & Mechatronics Engineering, September 1, 2016 – December 31, 2016.

ELLABIB, Issmail, Scholar, Department of Electrical & Computer Engineering, March 1, 2016 - August 31, 2016.

LI, Bingzheng, Scholar, Department of Chemical Engineering, March 1, 2016 – February 28, 2017.


LIU, Yongjun, Scholar, Department of Chemical Engineering, June 1, 2016 – May 31, 2017.

MOHAMMED, Seid, Jebril, Scholar, Department of Mechanical & Mechatronics Engineering, March 25, 2016 – August 24, 2016.


VANICAT, Susanne, Scholar, Department of Mechanical & Mechatronics Engineering, April 1, 2016 – August 31, 2016.

WEILAND, Jens, Professor, Department of Electrical & Computer Engineering, March 1, 2016 to August 31, 2016.


ZHENG, Yanmei, Scholar, Department of Chemical Engineering, May 1, 2016 – April 30, 2017.

Visiting Reappointments
BEDAWI, Safaa Mahmoud Ahmed, Researcher, Department of Electrical & Computer Engineering, April 1, 2016 - March 31, 2017.

Special Appointments
Undergraduate Instruction
ALSANBAWY, Mahmoud, Lecturer, Department of Electrical & Computer Engineering, May 1, 2016 - August 31, 2016.

GOORTS, Kevin, Lecturer, Department of Civil & Environmental Engineering, May 1, 2016 – August 31, 2016.

MORENO, Carlos, Lecturer, Department of Electrical & Computer Engineering, May 1, 2016 - August 31, 2016.

SNOWDON, Andrew, Lecturer, Department of Civil & Environmental Engineering, May 1, 2016 – August 31, 2016.
Special Reappointments
Undergraduate Instruction
BAYLEY, Tiffany, Lecturer, Department of Management Sciences, May 1, 2016 - August 31, 2016.

ELBESHBISHY, Elsayed, Lecturer, Department of Civil & Environmental Engineering, May 1, 2016 - August 31, 2016.

HOSSAIN, Kamal, Lecturer, Department of Civil & Environmental Engineering, May 1, 2016 - August 31, 2016.

Graduate Instruction
ALLARAKHIA, Minna, Lecturer, Department of Management Sciences, May 1, 2016 - August 31, 2016.

BLAKE, Clifford, Lecturer, Department of Management Sciences, May 1, 2016 - August 31, 2016.

ZAWAM, Mohamed, Lecturer, Department of Civil & Environmental Engineering, May 1, 2016 - August 31, 2016.

Adjunct Appointments
Graduate Supervision and Research
LOUCKS, Wayne, Associate Professor, Department of Electrical & Computer Engineering, February 1, 2016 – January 31, 2019.

B. ADMINISTRATIVE APPOINTMENTS
COLLINS, Michael, Associate Chair, Undergraduate Studies, Department of Mechanical & Mechatronics Engineering, May 1, 2016 – April 30, 2019.

FRASER, Roydon, Teaching Chair, Department of Mechanical & Mechatronics Engineering, January 1, 2016 – December 31, 2016.

NIEVA, Patricia, Deputy Chair, Department of Mechanical & Mechatronics Engineering, May 1, 2016 – April 30, 2019.

WECKMAN, David, Associate Chair, Undergraduate Studies, January 1, 2016 – April 30, 2016.

Wayne Parker
Acting Dean, Faculty of Engineering
FOR INFORMATION

A. APPOINTMENTS

Probationary Term Appointment

HALL, Heather, Assistant Professor, School of Environment, Enterprise and Development, July 1, 2016 to June 30, 2019: PhD, Queen’s University, 2012; MA, University of Waterloo, 2007; BA, Laurentian University, 2005. Currently a Postdoctoral Fellow at the International Centre for Northern Governance & Development at the University of Saskatchewan, Dr. Hall’s research interests include: local and regional economic development policy, planning and practice; innovation and the future of work in the North; community impacts and responses to labour mobility, and Aboriginal communities and the mining sector. Dr. Hall’s expertise in innovation systems accords with the direction and existing expertise in the School in social innovation and entrepreneurship, and aligns well with the Faculty’s strategic goals in this area.

Adjunct Appointments

Graduate Supervision

ADAMS, Aaron, Associate Professor, Department of Geography and Environmental Management, February 1, 2016 to January 31, 2019.

ALI, Genevieve, Assistant Professor, Department of Geography and Environmental Management, February 1, 2016 to January 31, 2020.

DUXBURY CARREIRO, Nancy, Associate Professor, School of Planning, March 1, 2016 to February 28, 2019.

HALL, Derek, Associate Professor, Faculty of Environment, February 15, 2016 to February 14, 2019.

PEACE, Walter, Associate Professor, School of Planning, February 1, 2016 to January 31, 2017.

TUBI, Amit, Assistant Professor, School of Environment, Resources and Sustainability, February 15, 2016 to December 31, 2016.

Graduate Supervision and Research

BALSDON, Jennifer, Assistant Professor, School of Environment, Resources and Sustainability, February 1, 2016 to January 31, 2018.

Research

LAURENCE, Anne Marie, Research Resource, School of Environment, Resources and Sustainability, November 15, 2015 to December 31, 2018.

Research and Instruction

JERNIGAN, Ed, Professor, Department of Knowledge Integration, August 1, 2016 to July 31, 2019.

Special Appointments

Instruction

BERBES, Marta, Lecturer, Department of Geography and Environmental Management, May 1, 2016 to August 31, 2016.
GHAREDAGHLOO, Behrad, Lecturer, Department of Geography and Environmental Management, May 1, 2016 to August 31, 2016.

HOOYKAAS, Amanda, Lecturer, Department of Geography and Environmental Management, May 1, 2016 to August 31, 2016.

McKENZIE, Ian, Lecturer, Department of Geography and Environmental Management, May 1, 2016 to August 31, 2016.

B. SABBATICAL LEAVES
For Approval by the Board of Governors
FEICK, Robert, Associate Professor, School of Planning, July 1, 2016 to June 30, 2017, at 100% salary.

LEDREW, Ellsworth, University Professor, Department of Geography and Environmental Management, January 1, 2017 to June 30, 2017, at 100% salary.

LI, Jonathan, Professor, Department of Geography and Environmental Management, January 1, 2017 to June 30, 2017, at 85% salary.

SCHWEIZER, Vanessa, Assistant Professor, Department of Knowledge Integration, July 1, 2016 to December 31, 2016, at 100% salary.

Jean Andrey
Dean
A. APPOINTMENTS (already approval by the Board of Governors)

Tenured

SCHIED, Alexander (Studies of Mathematics and Physics, 1992; Diploma in Mathematics, 1992; PhD, 1994, all from the University of Bonn), Professor, Dept. of Statistics and Actuarial Science, July 1, 2016. Dr. Schied is currently a professor of Mathematics at the University of Mannheim in Germany. He is very well known in the area of mathematical finance with close to 50 refereed publications including a very popular book on stochastic finance. Dr. Schied will significantly strengthen our research and teaching capabilities in the important area of mathematical finance. This is especially important for students in our Masters of Quantitative Finance program.

Probationary-Term Appointments

FENG, Mingbin (Ben) (BMath 2010; MMath 2011, both from the University of Waterloo; MSc 2013 and PhD exp. 2016 Northwestern University), Assistant Professor, Dept. of Statistics and Actuarial Science, July 1, 2016 – June 30, 2019. Mr. Feng is currently a PhD student in the Department of Industrial Engineering and Management Science at the Northwestern University, working under the supervision of Professor Jeremy Staum. His research interests include actuarial science, simulation design, financial engineering, and machine learning. Mr. Feng is also an Associate of the Society of Actuaries and will significant strengthen to our already very strong actuarial science group.

MARTIN-MARTINEZ, Eduardo (BSc 2007; MSc, 2008; PhD, 2011 all from the Universidad Complutense de Madrid), Assistant Professor, Dept. of Applied Mathematics, July 1, 2016 – June 30, 2019. Dr. Martin-Martinez is currently a Research Assistant Professor in the Institute for Quantum Computing and the Department of Applied Mathematics. Dr. Martin-Martinez' area of research is relativistic quantum information. He is the recipient of several awards including a Banting Postdoctoral Fellowship (2012-2014) and a 2014 John Charles Polanyi Prize. Dr. Martin-Martinez will be joining the Mathematical Physics research group of the department.

WALLACE, Michael (MA 2007, University of Cambridge; MSc 2008, University College London; PhD 2012, London School of Hygiene and Tropical Medicine) Assistant Professor, Dept. of Statistics and Actuarial Science, July 1, 2016 – June 30, 2019. Dr. Wallace is currently a Post-Doctoral Fellow in the Department of Epidemiology, Biostatistics and Occupational Health at McGill University. His current research is focused on dynamic treatment regimens and their application within the general sphere of personalized medicine. Dr. Wallace will add significant strength to our biostatistics group and complement the research work currently taking place.

Probationary-Term Reappointments

BATTY, Christopher, Assistant Professor, David R. Cheriton School of Computer Science, July 1, 2016 – June 30, 2019.
Continuing Appointments
LUSHMAN, Bradley (BMath 2000; MMath 2002; PhD 2007, all from the University of Waterloo), Lecturer, David R. Cheriton School of Computer Science, July 1, 2016. Dr. Lushman will teach five undergraduate courses per year and participate in student advising.

Definite Term - Reappointments
LIMAM, Noura, Assistant Professor, David R. Cheriton School of Computer Science, January 1, 2016 – December 31, 2018.

PEI, Martin, Lecturer, Dept. of Combinatorics and Optimization, December 31, 2016 – December 30, 2017.

Visiting Appointments

LU, Shufang (Zhejiang University), Scholar, David R. Cheriton School of Computer Science, August 20, 2016 – August 19, 2017.

Adjunct Appointments
Research
ALENCAR, Paulo, Professor, David R. Cheriton School of Computer Science, January 18, 2016 – January 17, 2019.

Adjunct Reappointments
Research

PORTH, Lysa (University of Manitoba), Assistant Professor, Dept. of Statistics and Actuarial Science, April 1, 2016 – March 31, 2019.

Grad Committee
ANAND, Madhur (University of Guelph), Professor, Dept. of Applied Mathematics, September 1, 2016 – August 31, 2019.

Postdoctoral Fellows appointed as Part-time Lecturers


KIM, Ringi, Dept. of Combinatorics and Optimization, September 1, 2016 – August 31, 2017.


B. ADMINISTRATIVE APPOINTMENTS


C. RESIGNATIONS

BERNARD, Carole, Associate Professor, Dept. of Statistics and Actuarial Science, effective December 31, 2015.

D. SABBATICALS (already approved by the Board of Governors)

CAMPBELL, Sue Ann (Professor, Dept. of Applied Mathematics), August 1, 2016 – July 31, 2017, with 100% salary.

GHODSI, Ali (Associate Professor, Dept. of Statistics and Actuarial Science), May 1, 2016 – November 30, 2016, with 85% salary.

KARSTEN, Martin (Associate Professor, David R. Cheriton School of Computer Science), September 1, 2016 – February 28, 2017, with 85% salary.

WIRJANTO, Tony (Professor, School of Accounting & Finance and the Dept. of Statistics and Actuarial Science), July 1, 2016 – June 30, 2017, with 93.3 salary.

Stephen M. Watt
Dean
For information:

A. **APPOINTMENTS**

**New Probationary Term**

**HAINES, Lacey**, Assistant Clinical Professor, School of Optometry and Vision Science, May 1, 2016 to June 30, 2019. [B.Sc., Memorial University of Newfoundland (2008); OD, University of Waterloo (2012); Ph.D., University of Waterloo (In Progress).] Dr. Haines trained at UW School of Optometry where she completed her OD and her contact lens residency. She will provide clinical care and supervision primarily in the contact lens clinic where we are short of supervision support. She has a strong background in the management of complicated contact lens patients and will be well placed to provide care to our complex patient base. She is currently finishing a Ph.D. and she has a strong background in scholarship. As a Clinical Assistant Professor, Dr. Haines will be working closely in the clinical training of our OD students.

**STANBERRY, Andre**, Associate Clinical Professor, School of Optometry and Vision Science, May 1, 2016 to June 30, 2019. [B.Sc., University of Western Ontario (2004); OD, SUNY State College of Optometry (2008).] Dr. Stanberry trained at SUNY College of Optometry, New York and did a residency in Ocular Disease and Family Practice in a multi-disciplinary inner-city clinic. He was previously an Assistant Clinical Professor at SUNY College of Optometry. Dr. Stanberry has been a part-time clinical instructor at UW School of Optometry Clinic since January 2015. He will be appointed as Associate Clinical Professor and Clinic Director. He brings a solid clinical background from a variety of academic and clinical practice settings. His experience in a variety of clinical settings supports his position as Clinic Director as he will bring some new perspectives to the clinic. His experience in academia supports his understanding of the needs and workings of an academic institution. Dr. Stanberry has a strong background in ocular disease – this background is beneficial as we see more and more patients with complex eye diseases that require ongoing management.

**WONG, William**, Assistant Professor, School of Pharmacy, April 1, 2016 to June 30, 2019. [B.Sc., York University (1999); M.Math, University of Waterloo (2000); Ph.D., University of Waterloo (2009).] Dr. Wong received his Ph.D. in the area of pharmacoinformatics. After his Ph.D. Dr. Wong took a position as a postdoctoral fellow in medical decision making and health economics at the University of Toronto. Since 2012, he has been a Research Scientist with the Toronto Health Economics and Technology Assessment (THETA) Collaborative at the University of Toronto. He is currently the PI on an operative grant from the Canadian Institutes for Health Research (CIHR) related to quality of life and utility in patients with chronic hepatitis C infection. Dr. Wong’s expertise in pharmacoeconomics will compliment ongoing research by other faculty members at the School of Pharmacy related to pharmacoepidemiology as well as clinical and practice-based interventions and outcomes.

**Probationary Term Reappointment**

**CHOI, Kyung Soo**, Assistant Professor, Department of Physics and Astronomy, July 1, 2017 to June 30, 2020. [B.S., Stony Brook University (SUNY) (2006); Ph.D., California Institute of Technology (2011).]
CRAIG, Paul, Assistant Professor, Department of Biology, July 1, 2017 to June 30, 2020. [B.Sc., University of Guelph (2002); M.Sc., University of Guelph (2004); Ph.D., McMaster University (2009).]

ROONEY, Rebecca C., Assistant Professor, Department of Biology, July 1, 2017 to June 30, 2020. [B.Sc., Carleton University (2003); M.Sc., University of Manitoba (2006); Ph.D., University of Alberta (2011).]

Definite Term Reappointment – Full-Time

BOHLOULI-ZANJANI, Parissa, Lecturer, Department of Physics and Astronomy, May 1, 2016 to August 31, 2017.

FENG, Yunwei, Research Assistant Professor, School of Optometry and Vision Science, January 15, 2016 to January 14, 2017.

Adjunct Appointments

Graduate Supervision

MENDOZA, Carl, Professor, Department of Earth and Environmental Sciences, February 1, 2016 to January 31, 2019.

O’SULLIVAN, Gwen, Assistant Professor, Department of Earth and Environmental Sciences, February 1, 2016 to January 31, 2019.

Adjunct Reappointments

Graduate Supervision

HWANG, Hyoun-Tae Hwang, Assistant Professor, Department of Earth and Environmental Sciences, February 1, 2016 to January 31, 2019.

PARK, Young-Jin, Assistant Professor, Department of Earth and Environmental Sciences, February 1, 2016 to January 31, 2019.

Undergraduate Instruction

COULSTON, Barbara, Assistant Professor, School of Pharmacy, January 1, 2016 to December 31, 2017.
Graduate Supervision and Research

MORENO-HAGELSIEB, Gabriel, Associate Professor, Department of Biology, April 1, 2016 to March 31, 2019.

Cross Reappointments

GUILLEMETTE, J. Guy, Associate Professor, Department of Chemistry cross appointed to Department of Biology, May 1, 2016 to April 30, 2019.

WARNER, Barry, Professor, Department of Earth and Environmental Sciences, cross appointed to Department of Biology, May 1, 2016 to April 30, 2019.

Changes in Appointment

HOULE, Sherilyn, Assistant Professor, School of Pharmacy, first probationary appointment extended one year in accordance with Policy 76 due to maternity leave, new end date June 30, 2018.

Special Appointments

Research Associate Appointed as Part-Time Lecturer

SCHOOR, Sarah, Lecturer, Department of Biology, July 1, 2016 to August 31, 2016.

Staff Appointed as Part-Time Lecturer

WADUWARA-JAYABAHU, Ishari, Lecturer, Department of Biology, May 1, 2016 to June 30, 2016.

Special Reappointment

Research Associate Appointed as Part-Time Lecturer

LIU, Ying, Lecturer, Department of Physics and Astronomy, May 1, 2016 to August 31, 2016.

B. ADMINISTRATIVE APPOINTMENTS

BALOGH, Michael, Interim Chair, Department of Physics and Astronomy, September 1, 2016 to December 31, 2016.

JONES, Lyndon, Director, Centre for Contact Lens Research (CCLR), May 1, 2016 to April 30, 2017.

McNAMARA, Brian, Chair, Department of Physics and Astronomy, January 1, 2017 to December 31, 2020.
WITT, Jonathan, Associate Chair, Undergraduate Studies, Department of Biology, January 1, 2017 to December 31, 2019.

ADMINISTRATIVE REAPPOINTMENT

DAYEH, Vivian, Associate Chair, Undergraduate Studies, Department of Biology, July 1, 2016 to August 31, 2016.

FOR APPROVAL BY THE BOARD OF GOVERNORS

C. SABBATICAL LEAVES

BIZHEVA, Kostadinka, Associate Professor, Department of Physics and Astronomy, Early Leave, September 1, 2016 to February 28, 2017, 85% salary arrangement.

DALTON, Kristine Nicole, Assistant Professor, School of Optometry and Vision Science, Special Early Leave, January 1, 2017 to June 30, 2017, 100% salary arrangement.

LIN, Shoufa, Professor, Department of Earth and Environmental Sciences, January 1, 2017 to December 31, 2017, 100% salary arrangement.

McNAMARA, Brian, Professor, Department of Physics and Astronomy, July 1, 2016 to December 31, 2016, 100% salary arrangement.

SCHIFF, Sherry, Professor, Department of Earth and Environmental Sciences, January 1, 2017 to December 31, 2017, 85% salary arrangement.

R.P. Lemieux
Dean
MEMORANDUM

To: Senate

From: James S Frank, Associate Provost, Graduate Studies

Copy: Sarah Hildebrandt, Director, Graduate Studies Academic Services

Date: March 12, 2016

Re: Graduate Degree – Senate – March 28, 2016

Student name: Shawei Hei

Degree: Systems Design Engineering, PhD
Conferral date: December 14, 2015

Student name: Abdulrahman Alhadhrami

Degree: Chemistry, PhD
Conferral date: March 11, 2016

The above students have been approved for early issuance of their degrees to support their employment outside of Canada. These degrees will be issued according to the Senate directive which delegates to the President, the Registrar, and the Associate Provost, Graduate Studies authority to grant a degree/diploma/certificate when circumstances necessitate outside the normal schedule for such approvals by Senate.

James S Frank,
Associate Provost, Graduate Studies
University of Waterloo
SENATE
March 2016
FOR INFORMATION

Council of Ontario Universities
Report of the Academic Colleague

The Academic Colleagues met on February 18th and 19th, 2016, at COU’s offices in Toronto. In addition to receiving a COU update on a number of issues itemized in the next page, the Academic Colleagues engaged in lively discussion on the issue of experiential learning, following two presentations by invited speakers.

Presentations and discussion on experiential learning
Colleagues saw two very different approaches to experiential learning: one from an industry leader perspective and one from a community involvement perspective. Queen’s recent report on experiential learning (http://www.queensu.ca/provost/committees/experiential-learning-working-group) was also distributed.

Guest speaker: Sanjeev Gill, IBM Canada
Sanjeev Gill provided a presentation focused on IBM’s engagement with academic institutions and their innovation initiatives. IBM supports experiential education through co-ops, internships, and programs such as their new women in STEM initiative. The presentation highlighted the importance of research outside the university setting (for jobs, for society, for the future). Partnerships with private organizations like IBM may provide opportunities to highlight the value of research. The presentation also highlighted the breadth of collaborative opportunities that are available to universities. However, it is unclear how private industry may be engaged in arts and humanities. There is a need for a cross-disciplinary perspective to be brought to industry. Colleagues were interested in considering the pathways that lead to faculty engagement in collaborative partnerships. How can faculty and universities provide leadership in this effort? What incentives and opportunities exist? What incentives are needed? Colleagues also discussed the extent to which IBM (and other private-sector innovators) research the impact of their innovations. To what extent do they conduct research on ethical implications of innovations and/or privacy issues? Might a social science perspective be brought to IBM’s projects? Universities have experts in these areas; good partnerships may be developed in these areas of intersection. For example, one area of interest might be research related to Canadian perspectives on the use of cloud technology.

Guest speaker: Lisa Chambers, Director, Centre for Community Partnerships, University of Toronto
Lisa Chambers provided an overview of university partnerships that support service learning opportunities for students. The presentation highlighted supports offered to faculty through the Centre, the process of engaging partners in the community, and strategies for sustaining partnerships. The presentation also noted the importance of advocacy efforts aimed at institutional leadership, as well as centralized support for (and organization of) experiential learning programs. In terms of relationships with the community, Lisa described that universities need to recognize that partners have value to bring to the partnership. Engagement may include bringing community partners into classrooms as guest speakers, or providing professional development opportunities to agency staff. In order to expand opportunities for students, it may be important to address structural and cultural barriers located in institutions. For example, incentives for faculty may need to be developed, including how developing service and experiential learning courses “count” in a promotion dossier.
COU update

Funding Review
Following the release of the University Funding Model Reform Consultation Report in December, COU has been considering possible MTCU directions. The demographic declines projected to affect enrolment are likely a concern for MTCU; anticipated enrolment declines represent a different context for universities than in recent years. Executive Heads and the Technical Advisory Group have discussed possible approaches; COU is recommending a collaborative approach with MTCU going forward. At this time, it is not clear how MTCU will focus or what the political dimensions might be.

Tuition
COU is working with MTCU on a project related to net tuition. Data gathered in this project will enable us to talk about how much students are actually paying relative to the “sticker price.” This approach is made possible by a collaboration between universities (bringing record level data) and MTCU (bringing OSAP data). Business changes for universities may result from the implementation of changes to OSAP. The tuition framework ends at the end of 2016-17. COU has started preparations for discussion with government.

Data
Sue Herbert’s University Funding Model Reform Consultation Report included a clear theme about the need for more consistent and coherent data. COU is approaching this issue with caution; there is risk and significant cost in developing sector-wide data. Universities develop data for their own purposes, but data for reporting purposes and policy development are different. COU is considering options.
Three major data initiatives are underway:
- Graduate Programs Outcomes Survey: Members of CUPA and OCGS are working in partnership with MTCU to develop an outcomes survey for graduate students. The survey is likely to launch in Fall 2016.
- Faculty at Work project: This project is a follow-up to the 2014 Faculty at Work report (available at http://cou.on.ca/reports/faculty-at-work/). An update will include information about contract teaching staff, and will provide a description of the variety of contract teachers in the university sector.
- OCAV Task Force on Quality Indicators of the Undergraduate Learning Experience: This Task Force is looking at existing and new metrics that may be used to collect data on quality undergraduate experiences. The group will engage with MTCU.

College degree granting
Following the credential review project, completed in June 2015, MTCU concluded that Ontario’s postsecondary system is meeting the key objectives of preparing students well for Ontario’s economy, and that the current credentials framework would not be expanded to allow the introduction of three-year degrees offered by colleges. MTCU also announced that colleges would be allowed to offer “honours” degrees; in order to receive the honors designation, degree programs must be reviewed by PEQAB. MTCU also announced the decision to uphold the existing policy for the collaborative delivery of nursing degrees rather than the introduction of stand-alone nursing degrees in the college system. The Ministry recently announced that further consultations on the topic of stand-alone nursing degrees will be pursued. COU is continuing advocacy efforts to encourage the continuation of the current collaborative approach.

HEQCO agency review
The Higher Education Quality Council of Ontario (HEQCO) will undergo an agency review. COU is looking for information on the framework and process that will guide the review.
Update on Government Initiatives

- Aboriginal Students: COU announced the Future Further initiative (see http://cou.on.ca/resources/future-further/), which is aimed at inspiring Aboriginal students to pursue postsecondary education. The website showcases videos and provides access resources. Aboriginal education is important to the government, and a high priority to universities. The new Ontario Graduate Scholarships set aside for Aboriginal students were also discussed. Once awards decisions have been made and information is available about how many Aboriginal students will receive the award, COU will help coordinate a communication effort.

- Cap and Trade program: This program (a carbon tax) may end up being very expensive for some universities. Many universities have taken important steps to green campuses in the past several years. In a meeting last week with the political staff of the Ministry of Environment and Climate Change, COU was told that there would be some relief for universities announced in the regulations. The physical plant managers at our universities are reviewing those to determine the extent of that relief. COU has developed a government relations plan to address the issues.

- Three government programs have been designed to build economic capacity and find efficiencies; these are driven by the structural problems with the economy, and the idea that while growing, universities need to find ways to leverage assets more successfully to drive that growth:
  1) Talent and Skills Summit: The second summit called by the Premier was aimed at demonstrating successful partnerships of business and/or community organizations with academic institutions. The Premier’s call to action focused on how we prepare the next generation for the labour force of the future and how do we measure what we are doing.
  2) Community hubs: The Ministry is interested in the development of hubs, and a Community Hub Secretariat has been initiated in the Premier’s office. The goal of the initiative is to consider opportunities for using public sector space including PSE space more efficiently, by collaborating with communities to address needs within existing or new space (for example, for utilizing satellite campuses).
  3) Cluster development: Universities are often the anchor for industrial clusters, providing the innovation to make them grow. The Ministry of Economic Development, Employment and Infrastructure is working toward a spring announcement about priority clusters and then will secure further dialogue with the university community.

- COU Strategic Communications Project: The project is moving forward. Polling, consultations, and key stakeholder interviews have been completed. An initial findings report will be provided to Executive Heads in March; a formal plan and request for approval will be provided at the Council Meeting in April.

The next meeting of the Academic Colleagues is scheduled for April 2016 in Toronto.

Marios Ioannidis
Academic Colleague
Council of Ontario Universities
FOR INFORMATION

The data for female hires at the different ranks for each faculty for the past five years are tabulated in the following spreadsheets.

3 February 2016

Flora Ng
Chair, UARC
## Data for Female Hires at the Different Ranks in each Faculty

### 2014-2015

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<th>Faculty</th>
<th>Gender</th>
<th>Lecturer</th>
<th>Assistant Professor</th>
<th>Associate Professor</th>
<th>Professor</th>
<th>Totals</th>
<th>% of Female Lecturers</th>
<th>% of Female Assistant Professors</th>
<th>% of Female Associate Professors</th>
<th>% of Female Professors</th>
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### Data for Female Hires at the Different Ranks in each Faculty

#### 2013-2014

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<th>Faculty</th>
<th>Gender</th>
<th>Lecturer</th>
<th>Assistant Professor</th>
<th>Associate Professor</th>
<th>Professor</th>
<th>Totals</th>
<th>% of Female Lecturers</th>
<th>% of Female Assistant Professors</th>
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2012-2013
## Data for Female Hires at the Different Ranks in each Faculty

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<th>% of Female Lecturers</th>
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MEMORANDUM

To: Senate
From: Senate Executive Committee
Date: 4 April 2016
Re: Senate Bylaw 2, paragraph 1.04(b) – Second Reading

It is the recommendation of Senate Executive Committee (“SEC”) that Senate bylaw 2, paragraph 1.04(b) be amended to provide clarity on the circumstances under which the powers of Senate may be exercised by SEC.

SEC discussed the matter at its meetings of 7 December 2015, 1 February 2016 and 7 March 2016.

Paragraph 1.04(b) of Bylaw 2 currently reads as follows:

The Executive Committee shall have the following powers and duties:

(b) To exercise the powers held by Senate, within the limits of The University of Waterloo Act, 1972, for what are normally considered routine matters, on those occasions when the agenda does not, in the estimation of the Executive Committee, warrant a meeting of Senate. All such actions are to be reported to Senate.

SEC recommends to Senate that Bylaw 2, paragraph 1.04(b) be amended to read as follows:

The Executive Committee shall have the following powers and duties:

(b) 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 The University of Waterloo Act, 1972, 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.

It is the opinion of SEC that the proposed amendment improves bylaw 2, paragraph 1.04(b) in the following ways:

1. It specifically provides for the power in SEC to cancel a meeting of Senate where SEC feels that the agenda does not warrant a meeting.
2. It limits the power of SEC to act for Senate only in circumstances of urgency.
3. It avoids the vagueness of the phrase “normally considered routine matters.”
4. It specifically excludes the power to act on behalf of Senate in certain named circumstances.

This proposed bylaw amendment is provided to Senate for second reading at its meeting of 18 April 2016.

Feridun Hamdullahpur
President & Vice-Chancellor
Chair, Senate Executive Committee
FOR APPROVAL

Elections to Senate Committees and Councils and to the Board of Governors

Motion: To acclaim the membership of Senate committees and councils and the Board of Governors as provided on the list of nominees (see attached).

Background: 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 been asked to recommend names of nominees to fill vacant seats on Senate committees and councils and the Board of Governors. At the meeting further nominations will be accepted from the floor. Where there is more than one name for a position, an electronic election will follow the meeting.

Feridun Hamdullahpur
Chair
LIST OF NOMINEES

- **Senate Executive Committee**
  Terms 1 May 2016 to 30 April 2017
  
  Faculty – one from each Faculty
  Applied Health Sciences  
  Richard Staines
  
  Arts  
  James Skidmore
  
  Engineering  
  Hamid Tizhoosh
  
  Environment  
  Mark Seasons
  
  Mathematics  
  Carmen Bruni
  
  Science  
  Barb Moffatt
  
  Faculty from Affiliated and Federated Institutions of Waterloo – one
  Wendy Fletcher
  
  Undergraduate Student – one
  Christos Lolas
  
  Graduate Students – two
  Robert Bruce
  Christopher Pugh
  
  Alumna – one
  Angela Pereira

- **Senate Finance Committee continued**

- **Senate Finance Committee**
  Terms 1 May 2016 to 30 April 2017
  
  Faculty – one from each Faculty
  Applied Health Sciences  
  Craig Janes
  
  Arts  
  Daniel O’Connor
  
  Engineering  
  Samir Elhedhli
  
  Environment  
  Jennifer Clapp
  
  Mathematics  
  Mark Giesbrecht
  
  Science  
  David Edwards

- **Senate Finance Committee continued**

  Faculty from Affiliated and Federated Institutions of Waterloo – one
  Katherine Bergman
  
  Undergraduate Students – two
  Tristan Potter
  Alexander Wray
  
  Graduate Student – one
  Vacancy
  
  Alumna – one
  Shikha Gandhi

- **Senate Long Range Planning Committee**
  Terms 1 May 2016 to 30 April 2017
  
  Faculty – one from each Faculty
  Applied Health Sciences  
  Diana Parry
  
  Arts  
  Tara Collington
  
  Engineering  
  Marios Ioannidis
  
  Environment  
  Simon Courtenay
  
  Mathematics  
  Dan Wolczuk
  
  Science  
  Mungo Marsden
  
  Faculty from Affiliated and Federated Institutions of Waterloo – one
  St. Paul’s Principal (1 May 2016)
  
  Undergraduate Students – two
  Hannah Beckett
  Sacha Forstner
  
  Graduate Student – one
  Vacancy
  
  Alumnus – one
  Jeff Bunn
Senate Nominating Committee for Honorary Degrees
Terms 1 May 2016 to 30 April 2017

Faculty – one from each Faculty
Applied Health Sciences
  John Garcia
Arts
  Neil Randall
Engineering
  Gordon Stubley
Environment
  Michael Drescher
Mathematics
  Bruce Richter
Science
  Mike Hudson

Faculty from Affiliated and Federated Institutions of Waterloo – one
  Susan Schultz Huxman

Undergraduate Students – two
  Vacancy
  Vacancy

Graduate Student – one
  Christopher Pugh

Alumni – one
  Vacancy

Senate Undergraduate Council
Terms 1 May 2016 to 30 April 2018

Faculty – one from each Faculty
Engineering
  Dan Davison
Environment
  Brendan Larson
  (Term 1 May 2016 to 30 June 2016)
Mathematics
  Dan Wolczuk
Science
  Carey Bissonnette

Faculty from Affiliated Institutions of Waterloo – one
  Veronica Austen

University Committee on Student Appeals
Terms 1 May 2016 to 30 April 2018

Faculty – one from each Faculty
Arts
  Vacancy (Duane Kennedy)*
Engineering
  Daniel Stashuk

Staff Member
  Stephen Cook

Undergraduate Student – one from each Faculty
Applied Health Sciences
  Tomson Tran
  (Term 1 May 2016 to 30 April 2017)
Engineering
  Pallavi Hukerikar
Science
  Mohammad Nasif

Graduate Student – one
Environment
  Vacancy

*Note: The faculty member indicated in parentheses is the current member with a term ending 30 April 2016. He may renew, but has yet to respond.
• Board of Governors

Faculty – three
Terms 1 May 2016 to 30 April 2018
  Sally Gunz
  Greta Kroeker
  David Porreca
  Neil Randall
  Hamid Tizhoosh

Undergraduate Student – one
Term 1 May 2016 to 30 April 2017
  Christos Lolas

Undergraduate Student – one
Term 1 May 2016 to 30 April 2018
  Andrew Clubine

Graduate Student – one
Term 1 May 2016 to 30 April 2017
  Robert Bruce

Graduate Student – one
Term 1 May 2016 to 30 April 2018
  Christopher Pugh
Senate Graduate & Research Council met on 11 April 2016 and agreed to forward the following item to Senate for approval. This item is recommended for inclusion in the regular agenda.

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

FOR APPROVAL

NEW ACADEMIC PLAN

Faculty of Arts
Philosophy

1. **Motion:** To approve a new plan in applied philosophy as described in Attachment #1.

   **Rationale:** This new plan is developed in response to demand from students and feedback from departmental alumni, and in response to a number of students seeking placements and other opportunities to use philosophy outside of the department of their own initiative. This plan aims to teach students how to integrate theoretical training in philosophy with the ability to apply philosophy to practical problems. This training will prepare graduates for pluralistic career pathways in a variety of domains including government, health care, business, and charitable organizations.

   /mg
   George Dixon
   Vice-President, University Research

   Jim Frank
   Associate Provost, Graduate Studies
UNIVERSITY OF WATERLOO

GRADUATE PROGRAM PROPOSAL
OF
PhD
IN
APPLIED PHILOSOPHY

Submitted to the
Ontario Universities Council on Quality Assurance

VOLUME I - PROPOSED BRIEF

SEPTEMBER 2015
TABLE OF CONTENTS

1. INTRODUCTION ............................................................................................................ 2
   1.1 Brief Listing of the Program ..................................................................................... 2
   1.2 Method used for Preparation of the Brief ................................................................. 2
   1.3 Objectives of the Program ........................................................................................ 5
   1.4 Admission Requirements .......................................................................................... 9
   1.5 a) Structure ............................................................................................................... 10
       b) Effect of Structure on Quality ............................................................................. 12
   1.6 Program Content ..................................................................................................... 12
   1.7 Mode of Delivery .................................................................................................... 14
   1.8 Assessment of Teaching and Learning ................................................................... 15
   1.9 Fields in a Graduate Program ................................................................................. 15

2. HUMAN RESOURCES ................................................................................................ 15
   2.1 a) List of Faculty by Field ....................................................................................... 16
       b) External Operating Research Funding ................................................................ 17
       c) Graduate Supervision .......................................................................................... 19
       d) Commitment of Faculty ...................................................................................... 20
   2.2 Quality of Faculty .................................................................................................. 20

3. PHYSICAL AND FINANCIAL RESOURCES ........................................................... 22
   3.1 Library Resources .................................................................................................... 22
   3.2 Laboratory Resources .............................................................................................. 28
   3.3 Computer Facilities .................................................................................................. 28
   3.4 Space ........................................................................................................................ 28
   3.5 Financial Support ..................................................................................................... 28

4. CURRICULUM .............................................................................................................. 29
   4.1 The Intellectual Development and the Educational Experience of the student ....... 29
   4.2 Program Regulations ............................................................................................... 33
   4.3 Part-time Studies ..................................................................................................... 37
   4.4 Curriculum .............................................................................................................. 37
   4.5 Collateral and Supporting Departments .................................................................... 37
   4.6 Organizational Structure ......................................................................................... 37

5. PROJECTED ENROLMENT ...................................................................................... 38

6. FINANCIAL PLAN ...................................................................................................... 39

7. APPENDIX I .................................................................................................................. 40
1. Introduction: Learning Objectives and Outcomes

1.1 Brief listing of the program
The PhD in Applied Philosophy is a new research program that will involve, as do most humanities PhD programs, the completion of course work, a prospectus and a dissertation project. The majority of students will attend full-time (though there will be provision for part-time study in special cases), and will pay regular fees, with courses offered on campus, many in conjunction with the existing Philosophy PhD program. While the program will not include a Co-op option, as the name suggests it will include a significant experiential learning component. The most distinctive feature of the new program will be the Applied Research Placement, in which students will gain experience doing philosophy in an applied way. For example, an Applied Research Placement could involve applying ethics in a research project at a hospital on end of life care or applying philosophy of science, epistemology, and ethics in a research project at a government agency on science policy or applying philosophy of language and ethics in a research project at an internet publishing company on distinguishing between erotica and pornography. The Applied Research Placement is a two-term activity in which one term is spent doing research and the other involves confronting a practical problem in a placement with a host organization. In this proposal, the term "Applied Research Placement," or "ARP," refers to this two-term activity, and the lowercase term "placement" refers to the portion of the ARP that the student spends with a host. Applied Research Placements will be supervised and evaluated by faculty members in the program and will include other supporting academic activities (e.g., reading, writing, auditing courses, attending summer schools, training in communicating effectively with audiences outside academic philosophy).

Other important features of the program will be courses specifically tailored to train students in application of philosophy to practical problems and the possibility of dissertation projects taking forms beyond that of the traditional monograph. We view the new program as part of the cross-Canada initiative to "remake the humanities PhD." However, we intend to implement this idea in a way that preserves the status of the program as a research PhD, and which makes the graduates strong candidates for both academic and non-academic careers; thus the dissertation projects will remain sole-authored major research projects. What will be distinctive will be that they may be more focused on, for instance, the solution of a particular practical problem than on detailed engagement with the current professional philosophical literature. To give one example, while philosophy theses have for some time often taken the shape of a collection of related journal-style papers, an applied dissertation project might include, as a major component, a collection of policy prescriptions.

A new PhD program is needed to allow the department to offer credit for this distinctive sort of work, in particular for the Applied Research Placement, and to give students a credential which will indicate to both non-academic employers and academic philosophers that the student has received distinctive training.

1.2 Method used for preparation of the brief
The start of the process leading up to this proposal can be dated with some precision: November 29, 2013. The Philosophy Department has for a few years been increasingly
Proposed Program – PhD in Applied Philosophy

deliberate about helping our graduate student recognize the variety of different interesting careers for which a graduate degree in philosophy prepares them, including by bringing in alumni who have gone on to interesting careers outside of academic philosophy. In discussions with these alumni it became clear that, in their opinion, the academic training they had received in our graduate programs was instrumental in their success, and that they rose through the ranks very quickly once they had a foot in the door with an employer, but that it often took longer than it might have to get a foot in the door in the first place. At the department meeting that day, the Chair, David De Vidi, brought forward a motion to make support for initiatives to increase the preparation of our graduate students for a variety of careers a fundraising priority for the department, a motion that passed unanimously.

Immediately after the department meeting, the Chair had a scheduled meeting with a faculty member, Patricia Marino, and one of her graduate students, Rosalind Abdool, who had recently landed an excellent position as an ethicist in a hospital. Their question was what could be done to make more evident to relevant possible employers, such as hospitals, that philosophy PhD students had expertise relevant to the requirements of some attractive jobs. In the course of the discussion between the three of them, the idea for a PhD program that would remain a proper research program in philosophy but would make clearer that the people completing it had particular skills that might be relevant to careers in a non-academic field as well as to an academic career began to take shape.

Marino, with input from DeVidi, prepared a discussion document about the idea, and presented it to the philosophy department at a department meeting on March 21, 2014. There was considerable useful discussion of the idea, after which the department unanimously adopted a motion that it should “further investigate the development of an Applied Philosophy program.” In consultation with Doreen Fraser, the Associate Chair, Graduate Studies at the time, the Chair decided that Marino and he would take the lead on this investigation and that DeVidi, Fraser and Marino would be designated an ad hoc departmental committee to work on the Applied Philosophy PhD proposal.

On July 8, Marino and DeVidi met Linda Warley, Associate Dean, Graduate Studies in the Faculty of Arts, to describe what they had in mind, to get a sense of whether the Faculty of Arts would support the development of such a program, and to take her advice.

The next step was a meeting by Marino and DeVidi with Jim Frank, the Associate Provost, Graduate Studies and key staff members in the Graduate Studies Office on July 15, 2014. Marino and DeVidi described the general idea as they then had it, introduced the “White Paper on the Future of the PhD in the Humanities” which can be seen to be similar in spirit to the department’s idea, and received some advice. Dr. Frank undertook to discuss the idea with Donna Woolcott, Executive Director of the Quality Assurance Council. On August 12, Dr. Frank sent an email reporting that Dr. Woolcott thought the idea of a PhD in Applied Philosophy was “exciting and timely.”

Taking the advice that they had received into account, Marino and DeVidi shaped a preliminary proposal that described a few options for what such a PhD program could look like, and some thoughts about its feasibility for the department and its likely impact for the existing PhD program. They took this document to the philosophy department on October 3, 2014. The department quickly decided on one of the options for the structure of the program.
Proposed Program – PhD in Applied Philosophy

as clearly preferable to the others, and unanimously passed a motion that the department should develop a detailed proposal for an Applied Philosophy PhD program. The only item that was somewhat contentious was whether “Applied Philosophy” was the best name. DeVidi and Marino undertook to consider alternative names, and asked department members to forward any suggestions to them.

Around the end of 2014, the Chair of Philosophy met with the Dean of Arts to discuss the prospect an additional faculty line for the department to enable it to successfully carry out two departmental initiatives—the launch of a new Applied PhD program in Philosophy and the move of the Women’s Studies Program into philosophy. This was the beginning of a process that led eventually to the Dean discussing the matter with the Vice President Academic and Provost, who approved this request.

Marino was on sabbatical from January-June of 2015, so Doreen Fraser and DeVidi took the lead on development of the proposal in the Winter term of 2015, with Fraser having primary responsibility for drafting the document. On April 10, 2015 a draft of the proposal was presented to the department. The department unanimously passed a motion to “endorse the proposal as presented,” after an explicit statement from the Chair that this meant that there would be one more meeting at which a later draft which did not differ in any essential way would be presented and at which the department would be able to vote yes or no on the proposal, but that while tweaks of the proposal would be considered at that stage significant modification of its structure should no longer be thought an option, because we hoped to launch the program soon.

Much of the effort from January 2015 to now has involved meeting with and taking proper account of the feedback received from stakeholders and allies. Among the consultations that had an important influence on the shape of the proposal were:

- Meetings with the Philosophy Graduate Student Association to get ideas and hear concerns
- Meetings with all interested department members, run by department member Shannon Dea, the Faculty of Arts Teaching Fellow, to brainstorm learning objectives.
- A follow-up meeting with the Centre for Teaching Excellence for advice about the learning objectives as drafted and for help with mapping the learning objectives to the GRDLEs
- Meetings with Co-operative Education and Career Action to describe the initiative, to get advice, and to determine whether a “feasibility brief” was needed. It was determined that there was no need for a feasibility brief
- A number of conversations with the representative of MITACS on campus, which has resulted in an offer from MITACS to enter into a Memorandum of Understanding with the Department that would ensure access to internships for some students in the Applied Philosophy PhD program
- Consultation with the Graduate Studies Office to ensure that we were following the proper processes for seeking approval for a new program
- Discussions with Institutional Analysis and Planning for assistance with compiling data required for the brief, and for assistance with presenting the business case for the
Proposed Program – PhD in Applied Philosophy

program. In the end, as will be clear from section 6, it was determined that no explicit presentation of the business case is required for this proposal.

- Meeting with the Associate Dean, Graduate Studies, in Arts for advice and to ensure that the Dean’s Office was aware of what we have in mind and approved of it
- Discussions with the director of the Waterloo Centre for the Advancement of Cooperative Education, to describe our initiative in relation to the Centre’s interest in Work Integrated Learning
- A meeting with the Associate Dean, Graduate Studies and the Director of Advancement for the Faculty of Arts to discuss fundraising options for the Applied Philosophy PhD. The result is that “experiential learning opportunities” for graduate students are a Faculty of Arts fundraising priority, and the department has received a first significant donation in support of awards to defray extra expenses entailed by a placement happening off campus.

In July, after returning from sabbatical, Marino took on the job of producing a polished draft of the proposal, integrating what had been learned in the meanwhile in the various consultations, and resumed the role of joining DeVidi at meetings with stakeholders.

On September 2, 2015, the updated draft of the proposal was presented to the department for final approval, and the issue of the name of the program was resolved.

1.3 Objectives of the program

1.3 a) Overview

The main objective of the Applied Philosophy Program is to teach students how to integrate theoretical training in philosophy with the ability to apply philosophy to practical problems. This training will prepare graduates for pluralistic career pathways. Outside the university, there is an increasing awareness of the fruitfulness of philosophical training and perspectives for solving complex problems. Philosophers are trained to think logically and abstractly about complex problems, and this training is useful in a variety of domains in government, health care, business, charitable organizations, and beyond. For example, the field of bioethics is growing rapidly, as decision-making in difficult medical circumstances becomes more and more complex; philosophers who have studied ethics have excellent training for such positions. Public decision-making about science and technology increasingly requires skills combining scientific literacy, critical thinking, and communication; students trained in philosophy of science are well-suited for this kind of work.

This new program is being launched in response to demand from students and feedback from alumni. A number of our students have sought out placements and other opportunities to use philosophy outside of the Philosophy Department—on their own initiative and outside of their programs. For example, several students have had placements or done volunteer work related to bioethics in hospitals. One of our students completed a MITACS internship as a philosopher in residence at an architecture firm. Other students have been hired by faculty as

1 For more information, see https://www.mitacs.ca/en/newsroom/success-story/investigating-philosophy-behind-near-living-architecture
research assistants to support interdisciplinary research projects in science policy, psychology, and sociology. Our alumni include health ethicists at hospitals, policy analysts in government, a patent officer at the National Research Council, among many others in positions in business, the government, and charitable organizations. Alumni have told us that their backgrounds in philosophy have been invaluable in their careers, but also that experience using philosophy acquired outside of their degree programs was important for getting their first jobs. A key objective of the Applied Philosophy program is to integrate experience using philosophy outside of the discipline into the PhD program.

Our existing Philosophy PhD program will continue to be offered alongside our new Applied Philosophy PhD program. The Department is committed to continuing to provide the same level of academic and financial support to students in the Philosophy PhD program. Faculty members continue to engage in research in theoretical philosophy and will continue to provide high-quality supervision for students in the Philosophy PhD program; Philosophy PhD students will continue to be offered opportunities to be employed as research assistants. Students in the existing program will benefit from the new program by participating in shared activities. For example, students in both programs will enrol in the same seminar courses and have the opportunity to participate in supplementary professional development activities (e.g., workshops on non-academic careers). Among other things, we hope that the program will motivate students to bring about change, both within the discipline of philosophy and outside it; by encouraging close interaction among all graduate students, we hope this motivation will extend to include students in our more traditional graduate programs as well.

This Applied Philosophy PhD program will be almost unique in Canada, and the second of its kind in North America. Bowling Green State University offers a PhD in Applied Philosophy which is advertised as “the only one of its kind” in North America. There are a handful of MA programs, but those programs are aimed specifically for training students for non-academic careers. The goal of Waterloo’s program is to provide a particular sort of research training to students -- one that, certainly, provides a degree of non-academic career-readiness not always evident for recent humanities PhD graduates, but one that also will give an advantage to students for many jobs in academic philosophy, where familiarity with “on the ground details” of particular practical problems can be an important differentiator compared to other likely job applicants.

1.3 b) Consistency of the program with the University’s mission

Having a PhD program at the University of Waterloo that is distinctive in this way aligns well with the University’s Strategic Mandate Agreement and Sixth Decade Plan. The Strategic Mandate Agreement notes Waterloo’s intention to strategically invest resources to “transform education and economies through experiential learning … and change lives … through highly relevant research,” and to “extend [experiential learning opportunities] to non-co-op students” which are clearly goals the new program advances. One of the eight themes of the Sixth Decade Plan is Experiential Education for All. This new program exemplifies this theme by addressing three of the planned outcomes: “[m]ore, and a broader range, of workplace experiential education opportunities will be available,” “[m]ore Waterloo students will

2 http://www.bgsu.edu/arts-and-sciences/philosophy/graduate-program.html
Proposed Program – PhD in Applied Philosophy

participate in work integrated educational experiences (e.g., research, inquiry, community service learning, entrepreneurship, international),” and “[s]tudent’s work experience outcomes will be integrated more effectively into student’s academic experience.” The proposed program also fits into the Outstanding Academic Programming theme, which has one of its stated goals to “[o]ffer leading-edge, dynamic academic programs” in which “[m]ore graduate students will develop professional skills.” The third relevant theme is Vibrant Student Experience, which sets the goal to “[e]nsure that students have an engaging, purposeful and relevant experience.”

The Faculty of Arts Strategic Plan includes the Objective for graduate students to “[p]repare students for careers inside or outside post-secondary educational institutions” which will be acted upon by “[d]evelop[ing] broadly conceived career and professional training opportunities, programs and resources, including more internships, co-op placements, and study abroad options such as co-tutelle programs.” This new program will also contribute to achieving another objective for graduate students, to “[i]mprove student satisfaction and retention.”

In a competitive environment for recruiting graduate students in Philosophy, the uniqueness of the program will be an advantage for attracting motivated, well-qualified graduate students. In academia more broadly, there is a growing recognition that PhD programs in the humanities need to do a better job of preparing students for non-academic careers. For example, in Canada the Social Sciences and Humanities Research Council (SSHRC)-funded Future of Graduate Training in the Humanities Project produced a White Paper on the Future of the PhD in the Humanities that makes the recommendation that “new PhD programs should be reoriented toward active participation in the world, should promote collaborative and interdisciplinary research, and should develop new kinds of teaching, research, and research deliverables.” A PhD program in Applied Philosophy will make the University of Waterloo one of the leaders in the movement to remake the humanities PhD.

1.3 c) Learning Outcomes and relation to Degree Level Expectations
As explained in more detail below in section 4, program requirements include completion of: the graduate seminar 680A/B twice, three one-term graduate courses, one Research Area, one Applied Research Placement, a dissertation project proposal, and a dissertation project, where a minimum of two one-term graduate courses must be among those designated by the Department as having applied content (i.e. chosen from among PHIL 675 and PHIL 676). Through this mix of coursework and the ARP, students will gain the skills traditionally associated with a PhD in Philosophy and also learn how to perform the kind of integrated thinking necessary in applied philosophy.

Specifically, in consultation with the Centre for Teaching Excellence, we have developed the following list of Learning Outcomes.

On completion of the PhD program in Applied Philosophy, students will be able to:

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Proposed Program – PhD in Applied Philosophy

1. Produce and contribute to philosophical research of the highest quality in the various forms appropriate to the discipline, including conference presentations, research symposia, journal articles and research monographs.

2. Demonstrate competence in a wide enough range of philosophical areas to be a broadly effective teacher and to contribute pedagogically in academic departments of various sizes.

3. Demonstrate the teaching skills and professionalism necessary to being a contributing member of an academic department.

4. Communicate effectively orally, graphically, and in writing with the public and professional audiences and/or academic audiences outside philosophy.

5. Collaborate effectively with researchers and other problem-solvers across a wide range of expertise, especially when this involves integrating philosophical methods with non-philosophical methods (e.g., empirical methods).

6. Explain philosophical tools, concepts, and arguments and their relevance to non-philosophers (knowledge mobilization).

7. Exhibit fluency in the relevant terminology, methods, background assumptions, and content of a discipline and/or community outside philosophy (including, if applicable, ethical, legal, and/or policy issues).

8. Identify, through background knowledge and research skills, the philosophical resources relevant to practical problems, evaluate the extent to which existing philosophical theories are applicable to specific contexts, and use case studies to critique existing philosophical theories and reframe existing debates.

9. Identify how philosophical expertise can be used to make contributions in a wide range of academic and non-academic careers.

The following chart shows how these Learning Outcomes relate to the Graduate Degree Level Expectations, and show how our program, designed to ensure students achieve each of the nine outcomes, will thus meet the Expectations. Larger X’s indicate major contribution and smaller x’s indicate subsidiary contribution. Information on how program requirements relate to Learning Outcomes is in section 1.5a) below.
Proposed Program – PhD in Applied Philosophy

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<tr>
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1.4 Admission requirements

Applicants will apply for direct admission to the Applied Philosophy PhD program. Application materials will include:

- transcripts from all previous post-secondary programs
- three letters of reference (one of which may be from a referee outside of academic philosophy)
- a writing sample on a topic in philosophy (2,500 – 5,000 words)
- answers to the following questions:
  - Question 1. Please provide a brief statement of interest that outlines the areas of philosophy you hope to pursue in the program.
  - Question 2. Please explain why the University of Waterloo Department of Philosophy is a good place to pursue such a project, and why your background makes you well suited to pursue it successfully.
- a statement of interest in Applied Philosophy (maximum one page)
- one page of supplementary information pertinent to Applied Philosophy (e.g., volunteer or work experience)
- English Language Proficiency Certification if required – minimum score of 100 overall on ibTOEFL or equivalent alternate test score – see Graduate Studies Calendar Admission.

Admission requirements are an MA in Philosophy or a related discipline with a minimum 80% average (to qualify for funding). Please note that all PhD students are guaranteed four years of funding. Admissions decisions will be made by the department's Graduate Committee.
Proposed Program – PhD in Applied Philosophy

Any student in good standing in the first year of the Philosophy PhD program may apply to transfer to the Applied Philosophy PhD Program. The deadline for submitting application materials for such a transfer will be the same as the deadline for submitting new applications for admission (currently Jan. 15 to ensure full consideration for funding and Feb. 1 otherwise).

1.5 a) Structure
Currently, each academic year, the Philosophy Department offers the following graduate courses: Phil 680 (the Departmental Seminar, required for all graduate students during the coursework phase of their programs), and a variety of courses all numbered either Phil 673 or Phil 674 (673 courses are cross-listed with senior undergrad courses, 674 courses are not). With the creation of the Applied Philosophy PhD program, we are adding two new course numbers, Phil 675 and Phil 676, to designate Applied Philosophy graduate courses, the 675 courses being cross-listed with senior undergraduate courses, the Phil 676 not.

During the Fall and Winter of their first year, Applied Philosophy PhD students will complete the Departmental Seminar (PHIL 680A/B) and three one-term courses from among PHIL 673, PHIL 674, PHIL 675 and PHIL 676. Two of these three courses must be from among PHIL 675 and PHIL 676, which are designated as having applied content. We expect that often PHIL 673 and PHIL 675 will be held together, as will PHIL 674 and PHIL 676. In these cases, the syllabus will specify how students enrolled in 675/6 can ensure that their presentations and final paper(s) meet applied philosophy expectations. Students enrolled in 675/6 may have the option of completing research projects for the course that take forms other than traditional research papers, such as writing policy or opinion pieces. See section 1.6 for more discussion of the difference between applied philosophy work and more traditional philosophical work.

During the second year Fall and Winter, will take the Departmental Seminar (PHIL 680A/B) again. There is some flexibility with respect to the order of the Research Area and the Applied Research Placement, but normally student progress will be as follows. In the Spring term of their first year and Fall of their second, students complete their research areas. In the Winter and Spring of their second year, students complete the Applied Research Placement, with the Winter devoted to background preparation and theoretical engagement and the Spring devoted to a placement at a host organization or other similar activity. While we anticipate that for most students, completion of the Research Area will precede completion of the Applied Research Placement, it is possible to reverse the order if doing so facilitates the Placement; since each is expected to take a total of two terms, they can simply be interchanged. The Applied Research Placement and Research Area replace the Comprehensive Exams that are part of many PhD programs in the humanities.

In the first half of their third year in the program, students will write and defend a prospectus for their dissertation project; this leaves 18 months for students to complete and defend the dissertation project within four years of beginning the program. Further details of the requirements are described in section 4 below.
Proposed Program – PhD in Applied Philosophy

As explained further in section 4, all placements involve agreements among the host, the student, and the supervisor, and all students are supported through funding during the time of their placements. With respect to structure, there are two ways the students can be funded during the placement activity. First, they can continue to receive their standard UW funding package, in which case the student is then regarded as doing a research activity of their own. Second, they can be funded through a funding organization like MITACS, which provides funding for graduate students to complete internships, in which case the student is paid partly through the funding organization and partly from the host; in this case the student is engaged in doing activities that combine research of their own with work directed by the host organization.

Students will complete the Centre for Teaching Excellence, CTE's Fundamentals of University Teaching, normally during their first-year; completion of this course is required before students are eligible to teach courses independently for the Department. Historically, our Department has been able to offer graduate students the opportunities to teach such courses; we expect this trend to continue with the Applied Philosophy PhD program and we will encourage students to take advantage of these opportunities.

As described below in section 4.1, we have an active colloquium series and other opportunities for scholars to visit the Department, present their work, and interact with us. There is also an annual graduate student conference and a "brown bag" series in which graduate students present their own work. All graduate students in our Department are expected to take part in such activities, and are especially encouraged to interact with speakers and visitors.

The following chart shows how these program requirements relate to the Learning Outcomes articulated in section 1.3c; two check marks indicate major contribution and one indicates subsidiary contribution.

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Proposed Program – PhD in Applied Philosophy

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1.5 b) Effect of structure on quality
The program is structured to allow students to engage in the bidirectional thinking we take to be characteristic of doing Applied Philosophy. As described further in section 1.6, doing "applied philosophy" is not a matter of simply taking existing theories and using them in practical contexts. Rather, consideration of the details of practical cases often leads to important rethinking or revision of existing theories. The program is therefore structured to allow students some back-and-forth: they are working primarily on learning existing philosophical views and learning traditional tools in the first year, then in the second year they undertake their Applied Research Placements. The written work required in the Applied Research Placements and the dissertation project are opportunities for the student to consider how the confrontation of the actual questions and details arising in the placement lead to insights and morals about existing philosophy.

The program is also designed to provide students with significant opportunities to work closely with faculty and to work intensively with people outside academia. The most important faculty-student interaction is normally the supervisory relationships involved in the production of the dissertation project and the Research Area. The placement aspect of the ARP allows the student to interact with those beyond the university setting.

One of the things motivating the design of the program is the view of several faculty members that during graduate school they learned almost as much from other graduate students as they did from faculty. We expect students in our existing PhD and MA programs and students in our proposed Applied Philosophy PhD program to learn a lot from one another, and the Department has therefore put in place a number of features intended, among other things, to build a sense of community among the students. For example, that the Departmental Seminar is a required course for all MA and PhD students during the course work portion of the programs ensures that the students are all together at least once a week, and that they have some common philosophical topics to discuss. The colloquium and visitor series, described further in section 4.1, also provides an occasion for students to talk about philosophical ideas with one another with a shared started point for discussion.

1.6 Program content
As described in more detail in section 4, students in the Applied Philosophy Program will take courses with applied content, complete one Research Area, complete one Applied Research Placement, and write dissertations that bring together theoretical philosophy and actual cases. Doing applied philosophy means engaging in bidirectional thinking, reflecting fruitfully both on how existing philosophical ideas and theories help us understand and solve practical problems, and also on how the details of actual cases leads us to reexamine and reformulate existing theories. In their applied philosophy coursework, their Applied Research Placement,
and their dissertation projects, students will engage in activities where they will learn both of these kinds of thinking.

With respect to the idea of applying existing theories, it's worth noting that this activity goes far beyond that of taking a theory and applying it to a case. Theories are embedded in complex frameworks, and it may be difficult to know how best to interpret the concepts in those frameworks fruitfully. Furthermore, information and experience about particular cases is typically an essential part of the process: philosophy cannot be applied in a vacuum. For example, to fruitfully apply ethical theories, it's important to have a full understanding of the factors in a situation, the various participants and how they are approaching the questions involved, the kinds of communication at work among the parties, and so on; to apply a theory to a superficial or schematic description of a case is usually not sufficient. Likewise, in engaging in interdisciplinary work, it's necessary to know enough about another discipline that one understands the norms involved, the communication styles and expectations, and so on; often the only way to gain this knowledge is to spend substantial time engaging with scholars in the other disciplines. In work related to society and politics, one often must learn in depth about very complex multidimensional social and cultural situations. Because of these factors, learning how to do applied philosophy requires a particular set of skills and a particular kind of critical mindset.

Doing applied philosophy also means using actual cases to inform theoretical frameworks. The best evidence that this fruitful strategy for philosophical research is the scholarly records of the faculty members in the Department. Attempts to apply existing theoretical frameworks to actual cases often lead to new results in the form of significant revisions to existing theoretical frameworks or entirely new frameworks. Professor Heather Douglas explains the implications for her own research in her article “Engagement for Progress: Applied Philosophy of Science in Context”: 4

Contrary to typical views of applied work, doing this kind of work has not involved a straightforward application of ready-made philosophy of science to a socially relevant context. Standard philosophical positions have not proven adequate for the contexts of use in which I am interested. Instead, it has involved understanding the conceptual terrain in a socially relevant context (“on the ground,” as it were) and thinking through the norms involved, employing distinctly philosophical techniques of conceptual analysis. Because the normative considerations that arise from the context require refinements or revisions of philosophical views, the conceptual work in the context of interest generates the particularly productive character of this approach. (p. 318)

Consideration of real case studies is similarly productive whether one is using oral history to inform accounts of testimony in the philosophy of language, 5 using examples of disabilities to

4 Douglas (2010), "Engagement for progress: applied philosophy of science in context," *Synthese* 177, 317-335. This special issue dedicated to Socially Relevant Philosophy of Science was edited by Fehr and Plaisance, who discuss further benefits of applied philosophy in their introduction.

5 Kenyon (forthcoming 2015), "Oral history and the epistemology of testimony," *Social Epistemology*. 

13
Proposed Program – PhD in Applied Philosophy

inform views on egalitarianism in political philosophy, or using neural models to inform theories of consciousness in philosophy of mind. Another way in which an applied approach to philosophy contributes to traditional philosophical research is described in the mission statement for Professor John Turri’s Philosophical Science Lab:

In the Philosophical Science Lab, we use methods, concepts and findings from the cognitive, social, and life sciences to make progress on philosophical questions, new and old. Our work combines the conceptual clarity and rigor characteristic of the best philosophy with the discipline and vigor characteristic of empirical science.

For example, this approach has shed new light on the norms of assertion (e.g., uncovering the rules governing the important social practice of information-exchange). One of the collateral benefits of the new program is that it will enrich the research programs of faculty members by attracting students who are well-qualified to employ as research assistants for their grant-funded applied philosophy research projects.

As explained in section 4.2.2, during the coursework phase of the program, students are required to take the year-long Department Pro-seminar (PHIL 680, 1-credit) during each of their first two years, to take two seminars (PHIL 673 or PHIL 675, .5 credits each) that can be cross-listed as undergraduate courses, and take one seminar (PHIL 674 or PHIL 676, .5 credits) that is graduate students only. The Research Area and Applied Research Placement are graduate-only courses (each 1 credit). Mathematically, 4.5 out of a total of 5.5 credits are graduate-only courses, which exceeds the two-thirds requirement.

1.7 Mode of delivery

For the near future, the Applied Philosophy Program is primarily aimed at full-time students on campus and we do not anticipate an online component. It should be possible to complete the PhD in Applied Philosophy on a part-time basis, and this might be an attractive option for professionals who want to complete the program while continuing to work; part-time students will complete the same program requirements as full-time students, doing so over a longer period of time. See section 1.5a above for details of how program requirements meet learning objectives and section 1.3b for a description of how the program meets Degree Level Expectations.


8 http://john.turri.org/lab.html

1.8 Assessment of teaching and learning
Coursework will be in the form of seminars (usually with fewer than 20 students); though each seminar professor creates their own specific grading breakdown, typically students are graded on the basis of one or two long research papers, performance in class discussion, and possibly a presentation. When PHIL 673 runs concurrently with PHIL 675 or PHIL 674 runs concurrently with PHIL 676, course instructors will indicate on the syllabus ways students enrolled in the applied philosophy courses (675 and 676) can ensure that their presentations and final paper(s) meet applied philosophy expectations.

In the case of PHIL 699: Applied Research Placement, as described below in section 4, the supervising faculty member the Applied Research Placement will determine specifically how the ARP is to be evaluated. But each ARP will include relevant reading and writing, and the default expectation is that the grade will be based on an assessment of the student's written work together with consideration of the host's final report. The supervisor will assign readings related to the topic of the ARP to be completed during the first term of the ARP and will assign written work. The written work for the area may take the form of an extended reflection -- focusing, for example, on how the relevant philosophy applied or failed to apply to given problems and cases -- or it may take the form of a more traditional philosophy paper offering specific conclusions about existing theories.

1.9 Fields in a Graduate Program
The Applied PhD program comprises the following fields:

- Language, Logic, and Metaphysics
- Ethics and Political Philosophy
- Philosophy of Mind and Cognitive Science
- Philosophy of Science and Mathematics

2. Human Resources

2.1 Resources for graduate programs only
All course instruction and supervision will be carried out by the 18 FTE faculty members with primary appointments in the Department of Philosophy and Kathryn Plaisance, a permanent full-time faculty member cross-appointed to Philosophy with primary appointment in the Department of Knowledge Integration in the Faculty of Environment. Since Knowledge Integration doesn't have a graduate program, Plaisance's appointment specifies that her graduate supervision will be Philosophy. The department currently has 17 FTE faculty, of whom two are Lecturer/Continuing Lecturer appointments.

The Provost has recently committed to a new complement position for Philosophy. The undergraduate teaching of the new hire will be for the Women’s Studies program that is moving into the department, but the position was granted specifically with the intention of supporting the Applied Philosophy program. Table 1 below lists the faculty members involved in the graduate program, identifies their field affiliation, and indicates gender.
Proposed Program – PhD in Applied Philosophy

2.1 a) List of faculty by field

Table 1

<table>
<thead>
<tr>
<th>Surname</th>
<th>Initials</th>
<th>Friendly Name</th>
<th>Rank</th>
<th>Sex</th>
<th>App Type</th>
<th>Dept Org Unit</th>
<th>Dept Category</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andres</td>
<td>Greg</td>
<td>Lecturer</td>
<td>M</td>
<td>M</td>
<td>Definite Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Ethics and Political Philosophy</td>
</tr>
<tr>
<td>Callaghan</td>
<td>Gerry</td>
<td>Lecturer</td>
<td>M</td>
<td>M</td>
<td>Continuing</td>
<td>1800 Philosophy</td>
<td>2</td>
<td>Language, Logic and Metaphysics,</td>
</tr>
<tr>
<td>Deez</td>
<td>F</td>
<td>Shannon</td>
<td>Associate Professor</td>
<td>F</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Language, Logic and Metaphysics,</td>
</tr>
<tr>
<td>DevVid</td>
<td>M</td>
<td>David</td>
<td>Professor</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Language, Logic and Metaphysics,</td>
</tr>
<tr>
<td>Gouget</td>
<td>Matilde</td>
<td>Associate Professor</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Ethics and Political Philosophy</td>
<td></td>
</tr>
<tr>
<td>Douglas</td>
<td>Heather</td>
<td>Associate Professor</td>
<td>F</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>Eliaamth</td>
<td>Christopher</td>
<td>Professor</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>3</td>
<td>Science</td>
<td></td>
</tr>
<tr>
<td>Fehr</td>
<td>Carla</td>
<td>Associate Professor</td>
<td>F</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>Feste</td>
<td>Jacqueline</td>
<td>Assistant Professor</td>
<td>F</td>
<td>Probationary</td>
<td>1800 Philosophy</td>
<td>ADD pending</td>
<td>Language, Logic and Metaphysics,</td>
<td></td>
</tr>
<tr>
<td>Fraser</td>
<td>L</td>
<td>Doreen</td>
<td>Associate Professor</td>
<td>F</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Kenyon</td>
<td>Timothy</td>
<td>Professor</td>
<td>M</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Language, Logic and Metaphysics,</td>
</tr>
<tr>
<td>Lovers</td>
<td>Christopher</td>
<td>Associate Professor</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Ethics and Political Philosophy</td>
<td></td>
</tr>
<tr>
<td>Malinon</td>
<td>Patricia</td>
<td>Associate Professor</td>
<td>F</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Ethics and Political Philosophy</td>
<td></td>
</tr>
<tr>
<td>Orend</td>
<td>Brian</td>
<td>Professor</td>
<td>M</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Ethics and Political Philosophy</td>
</tr>
<tr>
<td>Thagard</td>
<td>Paul</td>
<td>Professor</td>
<td>M</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Science</td>
</tr>
<tr>
<td>Turri</td>
<td>John</td>
<td>Associate Professor</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Language, Logic and Metaphysics,</td>
<td></td>
</tr>
<tr>
<td>Weinstein</td>
<td>Steven</td>
<td>Associate Professor</td>
<td>M</td>
<td>Tenure</td>
<td>1800 Philosophy</td>
<td>1</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>Plaisance</td>
<td>Kathryn</td>
<td>Assistant Professor</td>
<td>F</td>
<td>Probationary</td>
<td>2780 Integration</td>
<td>1</td>
<td>Mathematics</td>
<td></td>
</tr>
</tbody>
</table>

As explained in detail in section 2.2, since "applied philosophy" is not an area itself but is rather a collection of methods, approaches, and topics, all of the field affiliations listed are part of "applied philosophy." So all of the faculty listed in Table 1 will be contributing to the program.
2.1 b) External operating research funding

Table 2

<table>
<thead>
<tr>
<th>Fiscal Year 2</th>
<th>Tri-Agency Awards 3</th>
<th>Public Sector and Non-Profit Funding 4</th>
<th>Private Sector Funding 5</th>
<th>Internal Awards 6</th>
<th>Equipment Awards 7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/09</td>
<td>$88,333</td>
<td>$157,000</td>
<td>$42,500</td>
<td>$12,285</td>
<td>$2,162</td>
<td>$302,280</td>
</tr>
<tr>
<td>2009/10</td>
<td>$132,701</td>
<td>$100,000</td>
<td>$42,500</td>
<td>$9,900</td>
<td>$0</td>
<td>$285,101</td>
</tr>
<tr>
<td>2010/11</td>
<td>$82,950</td>
<td>$100,000</td>
<td>$0</td>
<td>$0</td>
<td>$10,000</td>
<td>$192,950</td>
</tr>
<tr>
<td>2011/12</td>
<td>$194,860</td>
<td>$105,450</td>
<td>$0</td>
<td>$5,500</td>
<td>$0</td>
<td>$305,810</td>
</tr>
<tr>
<td>2012/13</td>
<td>$229,807</td>
<td>$279,168</td>
<td>$0</td>
<td>$0</td>
<td>$56,617</td>
<td>$565,592</td>
</tr>
<tr>
<td>2013/14</td>
<td>$238,607</td>
<td>$672,337</td>
<td>$39,816</td>
<td>$8,000</td>
<td>$1,400</td>
<td>$960,160</td>
</tr>
<tr>
<td>2014/15</td>
<td>$133,970</td>
<td>$546,024</td>
<td>$0</td>
<td>$0</td>
<td>$1,400</td>
<td>$681,394</td>
</tr>
</tbody>
</table>

Notes:
1 Data is reported on the primary investigator only. Table includes research awards for faculty identified in In Faculty List.
2 The fiscal year used when reporting research awards is the fiscal year used by the government. The government fiscal year runs from April 1st until March 31st, thus the 2013/14 fiscal year runs from April 1st, 2013 until March 31st, 2014.
3 Excludes equipment grants (e.g. NSERC RTI).
4 Excludes equipment grants and internal awards (e.g. CFI, UW-RIF, UW-SSHRC).
5 Includes funding received from Industry partners.
6 Includes UW-RIF and UW-SSHRC.
7 Includes NSERC RTI and CFI.

Table 2 presents the external research funding received by the core faculty by source and by year for the past seven years.
Table 2a presents the external research funding received by the core faculty by field for the past seven years.

In all fields, faculty are successful in securing Tri-Council grants. Some fields, like Philosophy of Mind and Cognitive Science, bring in a larger amounts of grant money. This mostly reflects the interdisciplinary research focuses of particular faculty members in these areas, which open up access to more grant opportunities, and require more research funding to carry out successfully. Unlike some disciplines in the sciences, in many areas of philosophy external grant money is not essential to successful research at either the faculty or the student level, though all research active members of the department are strongly encouraged to apply for external grant funding.
2.1 c) Graduate supervision

Table 3

<table>
<thead>
<tr>
<th>Faculty Name and Rank</th>
<th>Career</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MA (Thesis)</td>
<td>MA (Paper)</td>
</tr>
<tr>
<td>Shannon Dea, Associate Professor</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>David Devidi, Professor</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Mathieu Doucet, Associate Professor</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Heather Douglas, Associate Professor</td>
<td>0</td>
<td>0(6)</td>
</tr>
<tr>
<td>Christopher Elasmiht, Professor</td>
<td>1</td>
<td>1(10)</td>
</tr>
<tr>
<td>Carla Feal, Associate Professor</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Jacqueline Fiske, Assistant Professor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Doreen Fraser, Associate Professor</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Timothy Kenny, Professor</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Christopher Lowry, Assistant Professor</td>
<td>0(2)</td>
<td>0</td>
</tr>
<tr>
<td>Patricia Marino, Associate Professor</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Brian Orend, Professor</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Paul Thagard, Professor</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>John Tutt, Associate Professor</td>
<td>2(3)</td>
<td>0</td>
</tr>
<tr>
<td>Steven Weinstein, Associate Professor</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kathryn Plaisance, Assistant Professor</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes:
1 Faculty members are listed in the categories specified in the Faculty List.
2 Number of thesis supervisions for the total of a faculty member's career. Faculty members who are involved in more than one graduate program should list the number of students supervised in the program under review and, in parentheses, the total number of students supervised in all graduate programs. If there are different types of degrees (e.g., MA, PhD) the number of supervisions in each degree should be noted.
3 Number of current thesis supervisions for each faculty member. Faculty members who are involved in more than one graduate program should list the number of students supervised in the program under review and, in parentheses, the total number of students supervised in all graduate programs. If there are different types of degrees (e.g., MA, PhD) the number of supervisions in each degree should be noted.

The field information in Table 3 gives an incomplete picture of our supervision activities, because so many of our students pursue projects that involve multiple field categories. For example, these recent PhD graduates include the following topics that involve more than one field:


Proposed Program – PhD in Applied Philosophy


2.1 d) Commitment of faculty from other graduate programs/other institutions
Not applicable.

2.2 Quality of faculty
"Applied Philosophy" is not a particular branch or area in philosophy, but rather a way of doing philosophy. All faculty members in the Department of Philosophy engage in academic activities that relate in some way to Applied Philosophy. In addition to publishing peer-reviewed research, the faculty regularly engage with the public, external organizations, and disciplines outside philosophy on a wide range of issues. Applied Philosophy supervision will cut across all four of our OCGS-approved official research areas: Ethics and Political Philosophy; Language, Logic and Metaphysics; Philosophy of Mind and Cognitive Science; and Philosophy of Science and Mathematics. The faculty can provide high-quality supervision for Applied Philosophy research projects on a wide range of topics, from applied ethics to interdisciplinary studies to science and society. As one reflection of the interdisciplinary research interests of the faculty, the Cognitive Science program is housed within the Department, and the Women’s Studies program soon will be as well.

*Ethics, Justice and Social Policy*: Faculty members conduct research on a wide variety of topics relevant to applied ethics, including the distribution of global health resources, ethical issues in scientific and medical research, the ethics of sport, sexual objectification, just war theory, and questions of autonomy for people with cognitive disabilities. Furthermore, there is current research in theoretical ethics on topics such as respect for autonomy, moral responsibility, moral conflict and dilemmas, value pluralism, egalitarianism, and human rights. Articles by faculty members with expertise in ethics have appeared in top philosophy journals such as *Philosophy and Phenomenological Research*, *The Journal of Moral Philosophy*, the *Journal of Social Philosophy*, and *Bioethics*. Their books have been published by Oxford University Press, Broadview Press, and McGill-Queens University Press. Orend’s book *The Morality of War* is used as a required textbook at many military academies including the US Military Academy at West Point, 2013, Dea won the Canadian Philosophical Association Prize for the best paper by a tenured professor for a paper on harm reduction, and in 2013 Marino was keynote speaker at Queertopia 6.0, a conference on sexuality at Northwestern University.

Faculty also engage in activities outside the University that are relevant to supervising Applied Research Placements in areas related to applied ethics and equity. DeVidi and Dea have extensive relevant experience in leadership roles with non-profit organizations. Dea’s work was recognized with the Leading Women Building Communities Award from the Ontario Women’s Directorate (2013); DeVidi was named Honorary Lifetime Member of the Board of Directors for Guelph Services for the Autistic in in recognition of his service. Orend has written opinion pieces on international law, foreign policy, and Canadian politics, for newspapers including *New York Newsday* and the *Kitchener-Waterloo Record*. Fehr is Associate Director of the American Philosophical Association Committee on the Status of Women Site Visit Program.
Proposed Program – PhD in Applied Philosophy

Many faculty members in the department are also well-qualified to supervise Applied Research Placements pertaining to equity and diversity in virtue of a combination of scholarship and experience. Fehr was a co-Principal Investigator on a multi-million dollar National Science Foundation ADVANCE Institutional Transformation grant at Iowa State University and served recently as the Chair of the Status of Women and Equity Committee (SWEC) at the University of Waterloo. DeVidi was awarded the inaugural University SWEC Equity and Inclusivity Award for his service to the University. Dea received an inaugural Faculty of Arts Service Award (2013) and is currently serving as Director of Women’s Studies.

**Interdisciplinary** Faculty members conduct interdisciplinary research that intersects with neuroscience (Eliasmith, Thagard), psychology (Fehr, Thagard, Turri), computer science (Eliasmith, Thagard), physics (Fraser, Weinstein), biology (Fehr, Plaisance), sociology (Plaisance), environmental science (Douglas, Fehr), linguistics (Kenyon, Turri), international studies (Orend), and classics (Feke). Senior and junior faculty have won prestigious research awards. Eliasmith (Canada Research Chair) recently won the Polanyi Award from NSERC—presumably the first time this prize has ever been awarded to a philosopher—and was appointed an inaugural Member of the College of New Scholars, Artists and Scientists of the Royal Society of Canada. Thagard, who is a fellow of the Balsilie School of International Relations, was awarded the Canada Council Killam Prize for the Humanities in 2013 and is a member of the Royal Society of Canada. Turri won an Ontario Early Researcher Award. Faculty regularly collaborate with scholars in other disciplines and have published in journals outside philosophy including *Human and Experimental Toxicology, Bulletin of Atomic Scientists, Cognition, Cognitive Science, Ecology, Classical and Quantum Gravity, Proceedings of the Royal Society, and Science.*

Faculty are cross-appointed to Systems Design Engineering (Eliasmith), Computer Science (Eliasmith), Knowledge Integration (Plaisance), and Physics (Weinstein); from 2004 to 2014 Orend was director of the University of Waterloo International Studies Department. Faculty are also affiliated with the Waterloo Institute for Complexity and Innovation (Thagard), the Waterloo Institute of Sustainable Energy (Douglas), and the Perimeter Institute for Theoretical Physics (Fraser and Weinstein). Eliasmith and Thagard are core members of the Centre for Theoretical Neuroscience.

**Science and Society** Faculty members conduct research on science policy, public understanding of science and technology, and the social structure of scientific communities. Douglas (Waterloo Chair in Science and Society) is cross-appointed to the Balsilie School of International Relations and a Fellow of the Institute for Science, Society, and Policy at the University of Ottawa. In addition to research publications, she has written and lectured on science policy for a public audience, served as a member of the American Association for the Advancement of Science (AAAS), and convenes the Science & Health Policy Research Cluster at the Balsilie School. Fehr (Wolfe Chair in Scientific and Technological Literacy) has published on diversity in scientific communities in addition to her work on teaching scientific and technological literacy. Dea is working on biological sex and social ontology and has a book forthcoming on this topic with Broadview press.
Proposed Program – PhD in Applied Philosophy

Plaisance’s current research concerns interactional expertise. The Department is an institutional member of The Consortium for Socially Relevant Philosophy of/in Science and Engineering (SRPOISE), which “supports, advances, and conducts philosophical work that is related to science and engineering and that contributes to public welfare and collective wellbeing” with the “aim to improve the capacity of philosophers of all specializations to collaborate and engage with scientists, engineers, policy-makers, and a wide range of publics to foster epistemically and ethically responsible scientific and technological research.”

Faculty members also possess the pedagogical expertise necessary to make a ground-breaking program such as this successful. Fehr, Plaisance, and Douglas have published on the methodology of applying philosophy in the context of socially relevant philosophy of science. Through SRPOISE, they (along with other faculty members and graduate students) have been considering how best to offer instruction, mentoring, and hands-on training to students. Kenyon has published research on the pedagogy of critical thinking which is empirically-informed and a textbook that focuses on applying critical thinking skills in social and scientific contexts. More generally, faculty have been recognized for the quality of their teaching. Kenyon has won the University Distinguished Teacher Award, Eliasmith and DeVidi have won the University Award of Excellence in Graduate Supervision, Dea is one of the inaugural Teaching Fellows in the Faculty of Arts, and Andres was the inaugural winner of the Faculty of Arts Award of Excellence for Teaching.

3. Physical and Financial Resources

3.1 Library Resources

Report on Library Resources for Proposed Applied Philosophy PhD Program
August 2015

The following is a summary of University of Waterloo Library information resources and services which would support of the PhD program in Applied Philosophy, prepared by Sarah Brown, Liaison Librarian for the Philosophy Department.

Information Resources
Material is already collected to support learning, teaching and research to the Undergraduate, Masters and PhD level in the Philosophy Department. The proposed PhD program in Applied Philosophy is well supported with the existing collection emphasis on:

http://srpoise.org/


The decision to purchase Library materials for Applied Philosophy would be the responsibility of the Philosophy Liaison Librarian, in consultation with the Faculty Library Representative. Selection would be guided by the Collection Development Policy\(^\text{13}\) for Philosophy, which is developed by the Liaison Librarian, in consultation with faculty members in the department of Philosophy. Materials are obtained in a variety ways including firm orders, open orders, approval plans, and subscriptions.

In response to user preference, the Library obtains resources in electronic format whenever it is possible and practical to do so. Some electronic resources are obtained directly by the Library and some are obtained through membership in the Ontario Council of University Libraries (OCUL) and the Canadian Research Knowledge Network (CRKN). Access to and use of electronic resources is generally governed by license agreements with the publisher or vendor.

Library funds for the Department of Philosophy support the cost of current journal subscriptions in the areas required to support the proposed Doctoral program. The Library collection also includes a considerable number of electronic journals that are part of large e-journal packages paid for through a central Electronic Resources library fund.

The Library, along with the libraries of the University of Guelph (UG) and Wilfrid Laurier University (WLU), is a member of the Tri-University Group of Libraries (TUG) consortium.

\(^{13}\) Collection Development Policies can be found online on the Library Web site (http://www.lib.uwaterloo.ca/staff/irmc/collectionsmanagement.html).

84
Proposed Program – PhD in Applied Philosophy

Collections from the University of Guelph and Wilfrid Laurier University enhance the depth and breadth of local materials available in subject areas of interest to the Applied Philosophy program.

The Library has purchased, or subscribes to, a range of electronic resources including research databases, full text journals, monographs, numeric data, and government publications. In addition, the Library identifies and provides access to select material freely available through the Internet. Such material includes open access journals, catalogues of libraries around the world, dictionaries, encyclopedias, and style guides.

The following are some of the electronic resources available that would be of particular interest to Applied Philosophy:

- L’Année Philologique
- America: History and Life
- Arts and Humanities Citation Index (accessed under “Web of Science”)
- Canadian Business and Current Affairs (CBCA)
- Environmental Sciences and Pollution Management
- Historical Abstracts
- JSTOR
- Leisure Tourism Abstracts
- Linguistics and Language Behaviour Abstracts
- MIT CogNet Library
- Philosopher’s Index
- PsycInfo
- PAIS International (Public Affairs Information Service)
- Scopus

Most of the electronic resources are purchased from the Electronic Resources library fund. Materials acquired for other departments are also of interest to the Department of Philosophy and relevant to the Applied PhD Program. Other departments include, but are not limited to, Biology, English, Environment and Resource Studies, Geography, Mathematics, Political Science, Psychology, Public Health, Sociology, and Recreation and Leisure Studies. These departments are highlighted for strong collections that support research in areas such as aging, autonomy, bioethics, climate change, disability, human rights, international development, linguistics and language, and policy analysis.

Statistics and Numeric Data

Also available to members of the uWaterloo academic community are the data holdings of <odesi>, OCUL’s digital repository for social science data (http://odesi.ca). <odesi> provides web access to resources such as the Statistics Canada surveys and datasets, including the Canadian Census, through the Library’s membership in the Data Liberation Initiative (DLI) and Canadian public opinion polls. Access is also available to the data holdings of the Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan, in Ann Arbor, Michigan (http://www.icpsr.umich.edu/icpsrweb/ICPSR/).
Proposed Program – PhD in Applied Philosophy

Services

Access to Electronic Resources
The primary tool for accessing electronic resources selected by the Library is its Web site (http://www.lib.uwaterloo.ca). This site organizes and provides access to licensed resources available to only University of Waterloo faculty, students and staff, as well as select Internet resources freely available to anyone. University of Waterloo faculty, students and staff may access electronic research databases and full text electronic journals from off-campus via the Library’s Proxy Server / Connect from Home feature. The Library also provides access to bibliographic management software (RefWorks).

Access to Print Collections
The Library’s print collections supporting the proposed Applied Philosophy PhD are housed primarily in the Dana Porter. Access to the entire Library collection, as well materials held by UG and WLU, is available through the Web accessible tool known as PRIMO (http://primo.lib.uwaterloo.ca).

Faculty, graduate students and staff may borrow most monographs for a term at a time. The Library also delivers to faculty, graduate students and staff copies of print journal articles from any of the University of Waterloo library locations, and from the libraries of the affiliated and federated colleges and universities. Faculty, graduate students and staff may also place holds on books from any of these libraries for pickup at any of the libraries’ circulation desks. Books and journal articles not owned by the Library, but held by UG or WLU, may be requested by faculty, all students and staff through Primo. Items will be delivered to University of Waterloo within three working days. The cost of these services is absorbed by the Library.

In partnership with UG and WLU, the Library owns a facility, known as the Annex, which is used to house low-use research material. In keeping with the University’s research intensive status, the TUG libraries ensure that a last copy is maintained in perpetuity, through the Preservation of Last Copy Agreement. Items housed in the Annex will be delivered to uWaterloo within three working days. The cost is absorbed by the Library. Books and copies of articles from print journals will be sent, upon request, to students living, temporarily, some distance from the campus. With the exception of return postage for books, the cost is absorbed by the Library.

Access to Resources from Institutions other than TUG
The Interlibrary Loan/Document Delivery (ILL) service provides faculty, students and staff with books, copies of journal articles, theses, and government documents from libraries within Canada and elsewhere. The Library uses OCUL’s RACER Web based interlibrary loan system (https://racer2.scholarsportal.info/) to facilitate ILL access and service for users. With minor exceptions, the cost is absorbed by the Library.

14 The Preservation of Last Copy Agreement is available online (http://www.lib.uwaterloo.ca/staff/irmc/last_copy_agreement_sept06.html).
Proposed Program – PhD in Applied Philosophy

Most Canadian university libraries extend, at no charge, in-person borrowing privileges to faculty, students and staff from across the country. Faculty, students and staff are entitled to borrowing privileges at participating libraries (http://www.curba.ca/).

Information Services
Research Skills, Critical Appraisal, Ethical Use
Drawing from the Ontario Council of Academic Vice-Presidents’ Guidelines for University Graduate Degree Level Expectations and the Association of College and Research Libraries’ Information Literacy Competency Standards for Higher Education, the Liaison Librarian for the Philosophy Department would develop 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. These sessions would support graduate students completing their literature reviews, comprehensives and graduate information research endeavours as part of their degree requirements and complement faculty mentoring in the same areas. Topics of interest to the Applied Philosophy PhD program could include training in the following areas:
- academic integrity,
- information management associated with major research projects,
- searching for and evaluating grey literature, including government documents and statistics.

Research Consultation and Support
The Liaison Librarian for the Department of Philosophy is available for consultation with individuals or small groups of students. He or she may be contacted directly in person, by phone, and by e-mail if a personal visit to the Library is not convenient. New graduate students and faculty members are contacted by the Liaison Librarian and invited to meet for a consultation about how best the Library can support the research and underlying learning needs of the new member of the University of Waterloo research community with respect to the resources and services offered by the Library (which may differ from their previous institution). The Librarian also develops and maintains an online subject guide for the Department of Philosophy (http://subjectguides.uwaterloo.ca/philosophy). This guide would support the proposed PhD in Applied Philosophy and additional guides or sections could be created and tailored to specific courses or aspects of the proposed program.

Reference assistance is available in person or by telephone at the Dana Porter Library’s Assignment & Research Help desk, which is staffed by professional librarians and specially trained library associates. Alternatively, faculty, students and staff may get reference assistance via e-mail and online chat available through the AskUs service (http://www.lib.uwaterloo.ca/asklib/index.html). The Library also offers general orientation programs including tours, workshops on research skills, and seminars for students. In addition, each fall, the Library participates in a campus-wide orientation program for incoming students, including programs specific to international students and students with disabilities.
Proposed Program – PhD in Applied Philosophy

Faculty, students and staff may keep abreast of new services and developments in the Library by reading news at your library (http://www.lib.uwaterloo.ca/newsatlib/), an electronic newsletter prepared periodically.

Financial Support for the Department
Summary of Library Expenditures

<table>
<thead>
<tr>
<th>Philosophy Library Fund</th>
<th>Journal Expenditures</th>
<th>Book Expenditures</th>
<th>Approval Plan Support</th>
<th>Total Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>$13,195</td>
<td>$7,935</td>
<td>$22,310</td>
<td>$43,445</td>
</tr>
<tr>
<td>2009/2010</td>
<td>$10,950</td>
<td>$14,535</td>
<td>$39,490</td>
<td>$64,975</td>
</tr>
<tr>
<td>2010/2011</td>
<td>$10,230</td>
<td>$18,835</td>
<td>$31,080</td>
<td>$60,145</td>
</tr>
<tr>
<td>2011/2012</td>
<td>$10,565</td>
<td>$21,290</td>
<td>$41,425</td>
<td>$73,280</td>
</tr>
<tr>
<td>2012/2013</td>
<td>$10,795</td>
<td>$14,485</td>
<td>$34,115</td>
<td>$59,395</td>
</tr>
<tr>
<td>2013/2014</td>
<td>$11,780</td>
<td>$16,610</td>
<td>$37,800</td>
<td>$66,190</td>
</tr>
<tr>
<td>2014/2015</td>
<td>$8,985</td>
<td>$12,520</td>
<td>$29,815</td>
<td>$51,325</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$76,500</strong></td>
<td><strong>$106,215</strong></td>
<td><strong>$236,040</strong></td>
<td><strong>$418,750</strong></td>
</tr>
</tbody>
</table>

N.B.: values shown have been rounded to the nearest dollar multiple of 5.
The drop in book expenditures and approval plan support for 2008/09 was the result of a temporary, and partial, freeze on monograph purchasing imposed because of the significant decline in the value of the Canadian dollar in the fall of 2008, and the consequent drop in the Library’s purchasing power. The freeze was lifted in May 2009.

Book expenditures and approval plan purchases are impacted by publishing patterns and the exchange rate.

What appears to be a general decline in journal expenditures deserves comment. In recent years, there have been no significant cancellations of journals. In fact, additional journals have been added to the Library’s collection as a result of purchasing publishers’ packages, often through consortia agreements.

The apparent decline is due to a number of factors including journals previously paid for by the Philosophy library fund having been transferred to the Electronic Resources library fund, a ledger reorganization that had a number of journals move from one funding category to another and invoices that were not received in the proper year.

Conclusion
I believe that a high level support for the proposed Applied Philosophy PhD would be provided by the Library, both in information resources and services.
I would be pleased to discuss the Library's holdings and services with the appraisers at the time of a campus visit.

Sarah Brown Liaison Librarian for the Department of Philosophy
Reviewed by Annie Bélanger, Associate University Librarian, Information Resources and Academic Excellence for Mark Haslett, University Librarian.
3.2 Laboratory Resources
Three members of the Department have established labs using grant money: Thagard directs the Cognitive Epistemology Laboratory, Eliasmith directs the Centre for Theoretical Neuroscience, and Turri directs the Philosophical Science Lab.

3.3 Computer facilities
Students have accounts on the University’s servers. These can be accessed via ethernet connections in the student’s offices, via WIFI anywhere on campus, from any of the computer labs on campus including the small lab in the Department, or via internet connections from home. These accounts give them access to the various sorts of software likely to be necessary for completion of their school work, including their TA duties. The library has an extensive collection of electronic resources that can be accessed through these accounts, and a document delivery service for journal articles that are not available electronically.

3.4 Space
The Philosophy Department is located on the third floor of Hagey Hall. There are seventeen faculty offices, each of about 133 sq. ft. Each permanent, full-time faculty member and each continuing lecturer has a private office with a phone and a computer. Contract and sessional instructors, postdoctoral fellows and visitors (e.g., the occasional Humphrey Professor in Feminist Philosophy) share three offices, each of about 133 sq. ft. Also available for faculty and student use are a seminar room (266 sq. ft.) large enough for twelve to fifteen people, in which tutorials and seminar meetings are usually held, a computer lab (133 sq. ft.), the graduate mail room/lunch room (317 sq. ft.), and the Philosophy Learning Commons and Library (556 sq. ft.).

We currently have six offices for graduate student use, with four or five desks to an office. Desks are normally available to all full-time graduate students within their funding periods or who are teaching for the department, and the available space is enough to allow us to continue this practice given the additional projected enrollment due to the Applied Philosophy PhD. Should enrollments grow further in the future, the department may need to adjust its rules about which graduate students get office space. Shared office and common space for graduate students totals approximately 1405 sq. ft.

3.5 Financial support
The Department normally admits full time graduate students only if it is able to offer funding. The guaranteed funding package for domestic15 PhD students is determined by the Faculty of Arts. PhD students entering the program in Fall 2015 are guaranteed a minimum of $22,000 per year for four years from a combination of scholarships and teaching assignments (contingent on remaining in good standing in the program). In the past, the Department has been able to offer many students a third term of teaching to earn additional money. All students in the program will be encouraged to apply for external scholarships (e.g., OGS, SSHRC). Students who win external scholarships receive a more generous package amounting to approximately $27,000 per year.

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15 International students are typically funded on a case-by-case basis with funding from sources external to the University (e.g., China Scholarship Council scholarships, Fulbright, Commonwealth scholarships).
As explained in section 1.5, there are two ways students can complete placements: they can continue to receive their standard UW funding package, in which case the student is then regarded as doing a research activity of their own. Or they can be funded through a funding organization like MITACS; in this case the student is regarded as doing activities that combine research of their own with work directed by the host organization.

With respect to the latter, the Department will sign a Memorandum of Understanding with MITACS, with the intention that they will support up to five Internships for students in the Applied Philosophy PhD program. Because these internships will involve employment for a term, they may extend time to completion somewhat; but they would also allow students to put their university funding on hold for a term, as they are, by comparison with the standard graduate funding, well-paid.

In some cases there may be extra expenses confronting the student because (for instance) the placement is at some distance from Waterloo. We have already received a donation of $32,000 in support of awards to cover such expenses. These awards will cover additional costs involved in doing an ARP compared to one of our traditional PhD Research Areas -- e.g., if travel is involved. It will be an award matched to projected expenses, rather than a reimbursement of expenses. This sort of support is a Faculty-wide priority for Arts Advancement. All such arrangements will comply with University regulations on compensation.

4. Curriculum

4.1 The intellectual development and the educational experience of the student
The Applied Philosophy program provides students with the opportunity to study philosophy in a way that brings together its theoretical aspects and its application to practical problems. The coursework requirements ensure that students take courses that both emphasize the application of philosophy to real life examples and builds up a broad and deep background in the discipline of philosophy. In the second year of the program, the Applied Research Placement will include an opportunity to conduct an applied philosophy research project, which involves a placement with a host organization outside the Department; the ARP will prepare the student to make a research contribution on a specific philosophical topic and to make an applied contribution outside philosophy. Finally, students will write dissertations with applied content.

Incoming students participate in an orientation program designed by the Department, the Faculty, and the Graduate Studies Office. Orientation in the Department typically includes practical advice on the structure of the program from the Graduate Coordinator, Graduate Officer, and senior graduate students; a tour of the Department; a preview of upcoming academic activities; and a session on teaching. University orientation activities include a mandatory session on academic integrity, an introduction to on-campus services, and campus-wide social gatherings. Both Department and University orientations include components to raise awareness of sexual harassment and discrimination and publicize information about counselling and emergency resources in the area. Later in the fall, the Department and the University hold workshops on applying for external scholarships (e.g., SSHRC, OGS). The Department encourages all students to apply for external scholarships.
Students will receive close attention from faculty members throughout the program. All students entering the program are assigned a pro tem advisor with whom they meet once per term until they are assigned a dissertation supervisor. Seminar courses typically have small enrolments in the range of eight to eighteen students. The Applied Research Placement and Research Area are both supervised one-on-one by faculty members. These requirements perform the same function as the comprehensive examination requirements in other Philosophy PhD programs. The Department believes that it is especially important for students to receive individual attention at this crucial stage, when they are transitioning from coursework to independent research. At the dissertation proposal and dissertation stage, students continue to receive one-on-one supervision from a faculty member and are also supported by two additional faculty members who serve as internal members of the dissertation committee.

The program has a number of features intended, among other things, to build a sense of community among all graduate students. The Departmental Seminar is a required course for all MA and beginning PhD students, which ensures that the students are all together at least once a week, and that they have some common philosophical topics to discuss. Students are strongly encouraged to attend the departmental colloquium series, at which they can hear talks given by visiting speakers about eight times per year. Recent speakers have included Tania Lombrozo (Berkeley), Ishani Maitra (Michigan), Elijah Milgram (Utah), Carrie Jenkins (UBC), and Jennifer Nagel (Toronto). Following each talk, faculty and graduate students continue informal discussion with the speaker at the Graduate House on campus. Several graduate students and several faculty members then take the speaker out to dinner. There are normally a number of reading groups on the go, usually involving both students and faculty (recently: pragmatism, game theory, structural realism, Fraser McBride on universals and particulars, and Helen Longino on scientific research on human behaviour). In addition, there are typically other research activities organized by faculty that involve graduate students from the department. For example, this year there is a Feminism and Science Graduate Student Working Group and some terms there is a series of work in progress talks by faculty. This year one of our PhD students and Lowry gave related public lectures to mark National Health Ethics Week. Faculty also lead research groups such as the Science & Health Policy Research Cluster at the Balsillie School and the Center for Theoretical Neuroscience lab group that will give Applied Philosophy students the opportunity to interact with scholars from across campus.

Students have opportunities to hold Research Assistantships and Research Studentships funded by the many research grants listed in Table 2. These research opportunities have led to conference presentations for the students and co-publications for the students.

In addition to the visiting speakers for the departmental colloquium series, there are often other faculty visitors to the Department. The Department hosts the Humphrey Professorship in Feminist Philosophy; this is an endowed Visiting Chair that allows us to bring in an internationally known feminist philosopher for a term, up to once a year. The duties are to give a series of public lectures, run a seminar for graduate students, and to serve as mentor and advisor to students in the Department. The three most recent Humphrey Chairs have been Anita Superson (2013), Ann Garry (2011), and Lisa Schwartzman (2010). The Department recently received a donation from an alumnus to fund the Brian Rudrick Visiting Scholar program. The program will bring in established scholars who are producing philosophical research at the cutting edge of the discipline for short visits of a week to ten days. Visiting scholars will deliver
Proposed Program – PhD in Applied Philosophy

at least two seminars for faculty and graduate students and a public lecture. This will be an excellent opportunity for students to get up to speed on current research and to interact with leading scholars. Our first Rudrick Visiting Scholar will be Jennifer Saul (Sheffield) in October 2015. Many faculty members also use their research grants to bring in faculty visitors and host events. For example, the annual “Waterloo Brain Day” is co-sponsored by the Centre for Theoretical Neuroscience (among others).

We have a very active Philosophy Graduate Student Association (PGSA). The PGSA also have their own speaker series, at which students present their works in progress to the other students. The PGSA also hosts an annual Graduate Conference, which gives students practice at the important professional skill of organizing a conference and encourages them to present their papers. In recent years submissions have come from nearby, all over North America (e.g., Tufts, Texas, Saskatchewan), and even overseas (e.g., Oxford, St. Andrews). Endowed funds allow us to bring in keynote speakers internationally: recent keynotes have included Julia Driver (Washington University St. Louis), Jamie Dreier (Brown), and Helen Longino (Stanford). The PGSA elects Master’s and PhD representatives to attend department meetings and to serve as a conduit for student feedback on such matters as hiring.

Students are encouraged to present their work at national and international conferences, and the Departmental Seminar prepares them to do so. Some funding for conference travel is available from the Department, the Associate Dean of Arts, and the Graduate Office of the University. In addition, the Department offers guaranteed support to students presenting at the Congress of Social Sciences and Humanities annual conference which hosts meetings of the Canadian Philosophical Association and other related societies. Last year, four of our PhD students presented papers at Congress. The Department also has funds from alumni donations that allow us to facilitate conference travel; from these funds each year the Department awards an Excellence in PhD Studies prize which funds conference travel for the winning student. In recent years, students have presented their work at many international conferences, including The 6th Conference of Experimental Philosophy Group in Nottingham, UK, The 32nd International Conference of Law & Mental Health in Berlin, Germany, and The Agent-Based Modeling in Philosophy conference in Munich, Germany.

An important part of the education of PhD students is their learning to teach at the university level. The orientation program offered by the Department includes a session on teaching. Students gain useful, closely supervised experience with each TA assignment. Simultaneously, students must complete Fundamentals of University Teaching course offered by the Centre for Teaching Excellence (CTE). The Department makes every effort to ensure that PhD students have an opportunity to teach at least one or two courses on their own before they graduate. Before teaching independently, students must complete the Fundamentals of University Teaching course. The Department has a permanent full-time Lecturer, Gerry Callaghan, who oversees the Extended Learning courses; Callaghan works intensively with the graduate students who TA these courses, thus helping them learn pedagogy and communication skills. Additionally, the Department has recently hired Greg Andres to coordinate the many offerings of our business ethics course and to provide mentorship to graduate student instructors teaching business ethics. Andres is particularly well-suited to providing this type of support because his teaching was recognized with an inaugural Faculty of Arts Teaching Award. Many graduate
Proposed Program – PhD in Applied Philosophy

students will be assigned a section of business ethics as their first independent teaching experience. This is of particular benefit to Applied Philosophy PhD students, who may find their experience teaching business ethics to undergraduates beneficial if they undertake applied research projects which involve communicating related ethical issues to non-philosophers. Students teaching courses other than business ethics independently for the first time are also paired with an experienced faculty mentor. Students are encouraged to complete the Certificate in University Teaching offered by CTE. Excellence in graduate student teaching is recognized with two annual teaching awards, one for a TA and one for an independent instructor.

The PhD program also incorporates a variety of different types of career preparation. The Departmental Seminar typically includes activities to support professional development for academic careers. A member of the Graduate Committee is assigned responsibility for supporting students on the academic job market. In recent years the Department has offered a series of workshops on pluralistic degree pathways. All of the workshops have brought in presenters from outside the Department, in addition to faculty participation; many of the presenters have been alumni of our program and other Philosophy programs who have themselves recently parlayed philosophy PhDs into careers outside of the professoriate. We remain in communication with these presenters; they've all offered to be available to for conversations with us and our students. Professor Shannon Dea was the primary organizer for a 2015 workshop, "The 'S' Word," which brought together grad students and faculty from across the Faculty to learn how to do, and to work through, career-oriented skills assessments. There was a break-out session in which faculty discussed amongst themselves how best to support non-academic career outcomes for students, while the grads continued to work through their skills assessments. Philosophy was also one of the funders of the event, and philosophers were very well represented at the event. Other workshops have included presentations from the University's Centre for Career Action, which offers a comprehensive range of services for graduate students.

The Centre for Career Action also offers other workshops which would help prepare students for their Applied Research Placements, such as "Résumés for Grad Students," "Non-academic Work Search and Networking" and "Mitacs: Skills of Communication." The University of Waterloo also offers students access to online Graduate Professional Development modules.

The Faculty of Arts also offers many resources for students interested in pluralistic career pathways, such as access to MyGradSkills.ca, a professionalization program for Ontario graduate students and postdoctoral fellows. In addition, the University of Waterloo has committed to joining a consortium of Humanities departments across Canada to initiate the TRaCE Project. This project is intended to develop a national (1) to track PhDs graduating in the humanities; (2) to report on where they are working, (3) to connect them with each other and with faculty and students inside the academy; and (4) to sponsor exchanges of knowledge and know-how among PhD students, faculty members, and PhDs pursuing careers in non-academic sectors. The department of Philosophy is a participating department and has already been engaging their doctoral alumni in such endeavours.

For more information about the activities of students, faculty members, and alumni in the Department, see our news blog Engaging Philosophy (https://uwphilnews.wordpress.com/), which is updated on a regular basis.
Proposed Program – PhD in Applied Philosophy

4.2 Program regulations

4.2.1 Admissions policies
Admissions decisions will be made by the Graduate Committee on the basis of evaluation of submitted application materials.

4.2.2 Degree requirements

A) Course work

The pre-dissertation requirements for Applied Philosophy PhD candidates are the following:

- Complete the department graduate seminar 680A/B twice. The seminar is a graduate level survey course intended to acquaint students with a number of topics under active investigation in the philosophical literature in a specific area of philosophy. The topics covered will vary from year to year, so students will not study the same material twice.

- Complete three one-term graduate courses (0.50 unit weight per course) at least one of which is a Philosophy 674 or 676 course. (Note: A minimum of five of the seven 0.5 unit courses taken during the first two years of the program are only for graduate students.)

- A minimum of two of the 0.5 unit graduate courses must be chosen from among PHIL 675 and PHIL 676 and thus have applied content. One course from another department may be counted towards the applied content requirement with the approval of the Graduate Officer.

- Complete one Research Area (PHIL 698) under the supervision of a faculty member. The intention is that the Research Area will prepare the student to make a research contribution in a particular area of philosophy. While it is possible to do an Area in one of the traditional divisions of philosophy (e.g., Metaphysics, Ethics, Logic or History of Philosophy), they will normally be on a more specific topic (e.g., Theories of Meaning and Mental Content, Theories of Human Rights, Theories of Truth, American Pragmatism from 1870 to 1930).

- Complete one Applied Research Placement (PHIL 699) under the supervision of a faculty member. The Applied Research Placement must involve applying philosophical research to a practical problem outside philosophy, and typically includes one term spent on research and one term combining research with a placement at a host organization. The ARP will prepare the student to make a research contribution on a specific philosophical topic and to make an applied contribution outside philosophy.

The Research Area and Applied Research Placement may be taken in any order. Either the Research Area or the Applied Research Placement will normally cover the subject in which the student intends to write a dissertation project. The Research Area and the Applied Research Placement must be supervised by different faculty members and fall within different sub-fields of philosophy.
Proposed Program – PhD in Applied Philosophy

Applied Research Area
The student selects a Research Area in consultation with the pro tem advisor, and the Area is supervised by a faculty member who is chosen in consultation with the pro tem advisor and approved by the Graduate Officer. The faculty member supervising the Area is free to assign readings, require the taking or auditing of relevant courses, assign papers, and so on, and also to determine the basis for assigning the grade. Written work which has been submitted for credit in a course may not be submitted for credit in an Area.

Before commencing an Area, the requirements must be set out in a written agreement which is agreed to by the supervising faculty member and the student, and approved by the Graduate Officer. The written agreement shall include
- the topic
- a complete list of required readings or a mechanism for determining the complete list of readings
- the written work to be submitted
- an agreement about how regular communication will occur (e.g., biweekly meetings; the student is to e-mail the supervisor a biweekly update)
- the expected completion date
- a description of how the grade will be determined

Copies of the written agreement will be given to the student, the Graduate Coordinator, and the Graduate Officer, and a copy will be kept in the student’s file. If a provision of the written agreement is violated, the supervising faculty member shall inform the Graduate Officer.

At the conclusion of the Area, the supervising faculty member will submit written comments along with the grade. Copies of the written comments will be given to the student, the Graduate Coordinator, and the Graduate Officer, and a copy will be kept in the student’s file.

Applied Research Placement
Students should contact their pro tem advisor and the Advisor for Applied Philosophy on the Graduate Committee at least three to six months before the start of the Applied Research Placement. The student selects a faculty supervisor for the Applied Research Placement in consultation with their pro tem advisor and the Advisor for Applied Philosophy. The Advisor for Applied Philosophy and the supervisor will work with the student to find a suitable applied philosophy research project in the student’s area of interest.

Two written agreements must be drawn up before the placement begins, both of which must be approved by the Advisor for Applied Philosophy and the Graduate Officer. First, there must be a "host agreement": a formal agreement between the student, the faculty supervisor, and the placement host organization setting out all parties’ expectations about the placement. As part of this agreement, the host organization should commit to providing a written report to the supervisor at the end of the placement. This report should describe and evaluate the student’s activities during the time of the placement. The Advisor for Applied Philosophy will ensure that the formal agreement complies with all applicable University regulations (e.g., research ethics clearance, compensation rules). If applicable, the Advisor for Applied Philosophy will coordinate the application for research ethics approval. If the placement would conflict with the
Proposed Program – PhD in Applied Philosophy

departmental graduate seminar (which must be taken in the second year of the program), the placement part of the ARP should be scheduled during the Spring term. All activities outside the Department undertaken as part of an Applied Research Placement must be approved by the Advisor for Applied Philosophy.

The second necessary agreement is the "Applied Research Placement contract," which specifies expectations between the student and the supervisor of the ARP. The faculty member supervising the ARP will determine specifically how the Applied Research Placement is to be evaluated and this will be specified in the ARP contract. Generally, a student should attain a level of competence that would allow them to make a research contribution. All Applied Research Placements will include relevant reading and writing assignments. For example, if the Applied Research Placement involves a placement, the supervisor may assign readings to prepare the student for the placement and/or during or following the placement. Following the placement, the student may, for example, be required to submit a reflective paper to the supervisor on a topic related to their use of philosophy during the placement.

The Applied Research Placement Contract shall include:

- a specification of the relevant philosophical area
- a description of the activities of the placement
- a complete list of required readings or a mechanism for determining the complete list of readings
- the written work to be submitted
- an agreement about how regular communication will occur (e.g., biweekly meetings; the student is to e-mail the supervisor a biweekly update)
- the expected completion date
- a description of how the grade will be determined

Though the supervisor has some leeway with respect to specifics, the default assumption is that the grade should be determined based on evaluation of the written work, evaluation of other communications with the student (e.g. during meetings), and the host's report. Copies of the written agreement will be given to the student, the Graduate Coordinator, and the Graduate Officer, and a copy will be kept in the student’s file. If a provision of the written agreement is violated, the supervising faculty member shall inform the Graduate Officer.

At the conclusion of the Applied Research Placement, the supervising faculty member will submit written comments along with the grade. Copies of the written comments will be given to the student, the Graduate Coordinator, and the Graduate Officer, and a copy will be kept in the student’s file.

In the event that reasonable efforts to find a suitable applied philosophy research project for a student enrolled in the program prove unsuccessful, the student will have the option of transferring to the Philosophy PhD program if s/he is in good standing in the Applied Philosophy PhD program.
Students are expected to complete their course work, one Research Area, and one Applied Research Area during the first two years of their doctoral studies. To be admitted to the dissertation project proposal stage, students must complete these requirements with an average of 83% in the courses, Research Areas, and Applied Research Placement with no mark lower than 75%. Students who do not complete the work within two years may only continue in the program at the Department's discretion. The Department may choose to set a further deadline for the completion of outstanding course work or the Research Area or the Applied Research Placement on a case-by-case basis. Students who do not meet all such further deadlines must be granted permission by the Department to continue in the program. In a case where the failure to meet progression requirements are solely due to problems in completing the Applied Research Placement that are judged not to be primarily the responsibility of the student, s/he may be permitted to transfer to the Philosophy PhD program.

**B) Dissertation project proposal**

Upon completion of their courses, the Research Area, and the Applied Research Placement students are admitted to the dissertation project proposal stage. They should then undertake discussions with a member of the Department and invite that person to be supervisor of their project, and should consult with the Graduate Officer concerning the formation of their committee. Students will then complete a prospectus for the dissertation project.

The project may take various forms (see 4.2.2C below) and it must involve the use of philosophical techniques or concepts to understand actual cases or substantial empirical or interdisciplinary work. The committee examines the student about the prospectus as they see fit, though normally in an oral exam. The committee may pass the proposal; pass it with revisions; require the student to revise the proposal for re-examination; or they may reject the proposal and require the student to withdraw from the program.

**C) Dissertation project**

Upon successful defence of the Dissertation Prospectus, students proceed to the dissertation project stage. The dissertation project may take the form of a traditional monograph, or it may take the form of several scholarly papers on interrelated topics, or it may take the form of scholarly papers together with work of a different type. In the case of the last option, the scholarly work should form the major component of the project, and the final part may take another form: it could be one or several publication for the press (for example, one in-depth article or three op-ed pieces); it could be a policy recommendation; it could be a contribution to industry (for example, part of a corporate ethics code). In the latter case, the student may be examined on the entire dissertation project at the defense, but it is expected that most of the questioning and most of the decision will be based on discussion of the scholarly component. The PhD degree is awarded after the project has been successfully defended in a public meeting and the final approved copy has been approved by the Graduate Studies Office for deposit in UWSpace.
Proposed Program – PhD in Applied Philosophy

D) Teaching preparation

PhD students will normally complete the Centre for Teaching Excellence, CTE’s Fundamentals of University Teaching, course in their first year. (Completion of this course is required before students are eligible to teach courses independently for the Department.) The department recommends that students who intend to pursue a career in university teaching also complete CTE’s Certificate in University Teaching during their time in the program.

Note: All incoming grad students must complete an Academic Integrity milestone to fulfill their degree requirements. The Faculty of Arts Graduate Office holds a workshop in September every year.

Normal time line for completion of the Applied Philosophy PhD

- Year 1: Fall and Winter: Three one-term courses, plus departmental seminar
- Summer: Begin Research Area or Applied Research Placement
- Year 2: Departmental seminar, complete Research Area and Applied Research Placement
- Year 3: Within 6 months, write and defend dissertation proposal

This leaves 18 months to complete and defend the dissertation within 4 years of beginning the PhD program.

Annual Progress Reports

Each year the Associate Chair, Graduate Studies, in consultation with faculty members in the Department, compiles a written progress report for each student in the program. Progress reports are sent to the students and kept on file in the Department.

4.3 Part-time studies

In special circumstances, applicants may apply to enrol part-time in the Applied Philosophy PhD program and full-time students in the program may change status to part-time. Part-time students do not receive a commitment of funding from the University. If resources allowed, the Department would support part-time students with teaching assistantships.

4.4 Curriculum

As described in section 1.5a, students will take courses with applied content, will do one traditional research area and will do one Applied Research Placement (PHIL 699). Course approval forms for PHIL 675, PHIL 676, and PHIL 699 are attached as appendices.

4.5 Collateral and supporting departments

Not applicable.

4.6 Organizational structure

The Applied Philosophy PhD program will be overseen by the Graduate Officer and Graduate Committee of the Philosophy Department, with one person from that committee designated as the Advisor for the Applied Philosophy program. We anticipate the faculty member serving as
Proposed Program – PhD in Applied Philosophy

Advisor to change from year to year. Admissions decisions will be made by the department’s Graduate Committee.

The main jobs of the Advisor for Applied Philosophy will be to oversee the ARPs and to facilitate the placements. The Advisor, in collaboration with the faculty supervisors and students, helps to identify suitable placements with host individuals or organizations. The Advisor must approve the formal agreements between the host, the student, and the faculty supervisor. S/he is responsible for ensuring that placements comply with all applicable University regulations (e.g., compensation rules). If research ethics approval is required, the Advisor coordinates the application. Written agreements between faculty supervisors and students for Applied Research Areas must be approved by both the Advisor and the Graduate Officer. The Advisor will also be responsible for ongoing support required for the smooth functioning of placements, such as maintaining good relationships with past hosts of placements.

The Advisor for Applied Philosophy will facilitate finding placement opportunities. In this direction, it is worth noting that we are already begun the process of making connections with potential hosts, and have received enthusiastic responses. We are currently in contact with the Centre for Clinical Ethics, with some charitable organizations including Facilitation Wellington Dufferin and some similar organizations in Perth County, with the Advancement office of the university, and with a bank. So we have grounds for optimism about our ability to generate a range of satisfactory placements.

The Advisor, in consultation with the Graduate Committee and the Scheduling Committee, is responsible for designating Philosophy courses as having "applied content" for purposes of the coursework requirement. The Graduate Officer must approve the written agreement between the student and the faculty supervisor for the Research Area. The Advisor, in consultation with the student’s dissertation supervisor, will determine whether a dissertation has appropriate applied content.

In cases where the student believes that the Advisor has made an incorrect judgment about applied content for courses, the Applied Research Placement, or the dissertation, the student may file an appeal. In such cases, the Graduate Committee (excluding the Advisor for Applied Philosophy) and the Department Chair are responsible for adjudicating the appeal.

5. Projected Enrolment
For at least the first few years of operation for the program, we project admission of between three and five students per year. We hope for somewhat higher enrolments in the future, once the program is established and such matters as arranging placements are more routine.

The Department’s current annual admission target for the existing PhD program is five students per year. We do not anticipate increasing this number, but expect that the existence of the Applied PhD program will allow us to increase the already high quality of the students we admit. We expect the new program to raise the profile of the Department and help us advertise some distinctive features of the work we do here, and so expect an increase in the number of high quality applicants over time. The net effect on enrolment therefore will be, eventually, a
Proposed Program – PhD in Applied Philosophy

doubling in the number of PhD students admitted to the Department, and an increase in quality.

The target applicant pool for this program is domestic students who have successfully completed a Master's Degree and who have a demonstrated interest in topics in applied philosophy. At present, we anticipate only being able to admit international students if they have full funding packages from sources external to the university (e.g., China Scholarship Council funding, Fulbright, Commonwealth Scholarships, and the like). Should provincial funding priorities change so that it becomes more economically reasonable to admit international students, we expect we would be able to attract some international students each year, but the majority of our students are likely to continue to be Canadians and Permanent Residents.

6. Financial Plan
On the advice of Institutional Analysis and Planning, a financial plan was not prepared as: 1) this new Applied Philosophy PhD program can be managed within the existing human and financial resources and commitments that are already in place in the department, 2) the program does not deviate from the institutional tuition rate structure, and 3) the program follows a normal enrolment pattern. A new faculty position to assist with supporting this program has already been approved.
Senate Undergraduate Council met on 8 March 2016, and considered a proposal for a new articulation agreement and changes to academic plans. Council agreed to forward the following item to Senate for approval. Council recommends this item be included in the regular agenda.

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

FOR APPROVAL

NEW ACADEMIC PLANS

► Faculty of Science
  Articulation Agreement
  
  1.  **Motion:** To approve the articulation agreement with Hefei Univeristy of Technology as presented in Attachment #1.

     **Rationale:** This articulation agreement outline the admission, progression and transfer credit requirements between the two institutions. Upon signing of the agreement, calendar text will be forthcoming.

CHANGES TO ACADEMIC PLANS

► Faculty of Engineering
  Electrical and Computer Engineering
  
  2.  **Motion:** To approve changes to the electrical and computer engineering plan as presented in Attachment #2 and effective 1 September 2017.

     (strikethrough = deleted text; underline = new text.)

     **Note to reader:** in the attachment, underlined blue text represents hyperlinks and should not be taken as new text, however strikethroughs in blue text do represent deletion. For clarity, both amendments and final calendar copy with hyperlinks are provided in the attachment.

     **Rationale:** The Department of Electrical and Computer Engineering has proposed a number of curriculum changes as a result of an extensive study process which began in 2007. The proposed changes to the curriculum reflect current knowledge requirements in these fields and are informed by input from students, faculty, and other stakeholders.

► Faculty of Science
  Chemistry
  
  3.  **Motion:** To approve changes to the honours chemistry plan as presented and effective 1 September 2017.

     (strikethrough = deleted text; underline = new text.)

     **Advisor:** See Faculty of Science, Academic Advisors

     Continuation in Honours Chemistry requires a cumulative overall average of 60% and an average of 60% in all Chemistry lecture courses.
In order to graduate with an Honours Chemistry degree, the following requirements must be successfully completed:

1. Completion of 24.0 units, with 20.0 lecture units (including CHEM 494A/CHEM 494B) and 4.0 lab units.
2. In Years Three and Four, students must choose five courses from the list of Technical Electives with Chemistry content. Consult the Chemistry Department website or plan advisor for a current list of courses that qualify as technical electives.
3. At least two of the electives in this program must be lecture courses chosen from those offered in the Faculties of Arts or Environment. Students are encouraged to include in their Academic Plan an ethics course such as STV 100, PHIL 215, PHIL 221.
4. Students may seek Departmental consent to take CHEM 495, CHEM 496, or CHEM 497 in place of CHEM 494A/CHEM 494B plus three electives.
5. Failure in more than two Chemistry lecture courses will result in the requirement to withdraw from the Academic Plan. Students may petition for re-admission; such re-admission is at the discretion of the Chemistry Undergraduate Committee. There must be exceptional circumstances to justify re-admission.
6. Mandatory courses as listed below.
7. No more than 3.0 "SCI-labelled" units will be allowed toward this Academic Plan.
8. At least one of the electives in this program must be a Mathematics course (e.g., AMATH, CO, MATH, PMATH, STAT). Contact the plan advisor for a list of recommended courses.
9. Completion of the English Language Proficiency Requirement.

1. 22.0 units that include:
   a. 9.0 units of required CHEM courses: CHEM 100, CHEM 120, CHEM 120L, CHEM 123, CHEM 123L, CHEM 140, CHEM 200, CHEM 212, CHEM 220, CHEM 220L, CHEM 221, CHEM 233, CHEM 240, CHEM 250L, CHEM 254, CHEM 264, CHEM 265, CHEM 265L, CHEM 313L, CHEM 356, CHEM 494A, and CHEM 494B;
   b. 1.0 unit of required MATH courses: MATH 127 and MATH 128;
   c. 1.5 units of required PHYS courses: PHYS 111/111L or PHYS 121/121L and PHYS 112/112L or PHYS 122/122L;
   d. 10.5 elective units distributed as follows:
      i. 5.0 units of CHEM from the list of Program Electives with the following additional restrictions:
         1. a minimum of 1.0 lab unit from CHEM 224L, CHEM 310L, CHEM 350L, and CHEM 360L;
         2. a minimum of 1.5 lecture units from CHEM 310, CHEM 313, CHEM 323, CHEM 350, and CHEM 360, with a minimum of 0.5 unit chosen from CHEM 310 and CHEM 313;
         3. a minimum of 2.0 lecture units from 400-level courses;
      ii. 0.5 unit chosen from AMATH, CO, MATH, PMATH, or STAT courses. Students should contact the academic plan advisor for a list of recommended courses;
      iii. 1.0 unit chosen from lecture courses offered in the Faculties of Arts or Environment. Students are encouraged to include in their Academic Plan an ethics course such as STV 100, PHIL 110B, PHIL 215, PHIL 221;
      iv. 4.0 units chosen from any 0.5 unit lecture or lab course;

2. The English Language Proficiency Requirement.

Additional Program Conditions:

1. Maximum of 3.0 units of SCI-labelled courses can be used towards the Honours Chemistry degree.
2. Maximum of two failures in CHEM courses are allowed. Failure in more than two CHEM courses will result in the requirement to withdraw from the academic plan. Students may
petition for re-admission to the plan. There must be exceptional circumstances to justify re-admission.

Students can build strength in a specific focus area by directing their Program Electives in Year Two and Year Three towards specific courses, as described below. By doing so, students will be adequately prepared for 400-level courses in those areas. Students interested in pursuing graduate studies in Chemistry should build strength in at least two focus areas.

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Recommended Year Two and Three Program Electives</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Lecture courses</td>
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<td>Inorganic Chemistry</td>
<td>CHEM 310, 313</td>
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<td>Theoretical/Computational/Physical</td>
<td>CHEM 209, 340, 350</td>
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<td>Organic Chemistry</td>
<td>CHEM 360, 363</td>
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<tr>
<td>Polymer Chemistry</td>
<td>CHEM 370</td>
</tr>
<tr>
<td>Medicinal Chemistry</td>
<td>CHEM 363, 381, 383 (383 was formerly 482)</td>
</tr>
</tbody>
</table>

Recommended Course Sequence

**Year One**

Fall
- CHEM 100 Introduction to Chemical Sciences
- CHEM 120/CHEM 120L Physical and Chemical Properties of Matter/Laboratory
- MATH 127 Calculus 1 for the Sciences
- PHYS 111/PHYS 111L Physics 1/Physics 1 Laboratory or PHYS 121/PHYS 121L Mechanics/Laboratory
  - Two electives (1.0 unit)

Winter
- CHEM 123/CHEM 123L Chemical Reactions, Equilibria and Kinetics/Laboratory
- CHEM 140 Introduction to Scientific Calculations
- MATH 128 Calculus 2 for the Sciences
- PHYS 112/PHYS 112L Physics 2/Physics 2 Laboratory or PHYS 122/PHYS 122L Waves, Electricity and Magnetism/Laboratory
  - One elective (0.5 unit)

**Year Two**

Fall
- CHEM 209 Introductory Spectroscopy and Structure
- CHEM 200 Introductory to Laboratory Techniques
- CHEM 220/CHEM 220L Analytical Chemistry 1/Laboratory
- CHEM 240 Mathematical Methods for Chemistry
- CHEM 250L Physical Chemistry Laboratory 1
- CHEM 264 Organic Chemistry 1
  - One elective (0.5 unit)

Winter
- CHEM 212 Structure and Bonding
- CHEM 221 Analytical Chemistry 2
- CHEM 224L Analytical Chemistry Laboratory 2
- CHEM 254 Introductory Chemical Thermodynamics
CHEM 265/CHEM 265L Organic Chemistry 2/Laboratory
One elective (0.5 unit)

Note:
Students may choose to take CHEM 233 in place of an elective in the Winter term to decrease the number of required Chemistry courses in Year Three.

Year Three
Fall
CHEM 310/CHEM 310L Transition Element Compounds and Inorganic Materials/Laboratory
CHEM 323 Analytical Instrumentation
CHEM 350L Physical Chemistry Laboratory 2
CHEM 356 Introductory Quantum Mechanics
Two Four electives (1.0 2.0 units)

Winter
CHEM 233 Fundamentals of Biochemistry (or an additional elective if CHEM 233 has been taken in Year Two)
CHEM 313/CHEM 313L Main Group and Solid State Chemistry/Laboratory Inorganic Chemistry Laboratory 1
CHEM 350 Chemical Kinetics
CHEM 360/CHEM 360L Organic Chemistry 3/Laboratory
One Four electives (0.5-2.0 units)

Year Four
CHEM 494A Research Project
CHEM 494B Research Project
Eight electives (4.0 units)

Rationale: The 2015 Canadian Society for Chemistry (CSC) accreditation report showed that the total number of Waterloo chemistry contact hours and the number of required chemistry courses exceeded both the CSC requirements and the national averages calculated for Canadian universities. The CSC recommended that the department reduce the total number of hours of chemistry instruction and increase the flexibility of the program, which these amendments aim to do. To guide students in their upper-year course selections, the department has provided recommended sequences of CHEM courses for building strength in specific focus areas. The change in total units required is also consistent with the Faculty of Science plan standardization goal that Honours BSc plans involve 21.0 or 22.0 units.

Faculty of Science
Chemistry

4. Motion: To approve changes to the honours co-operative chemistry plan as presented and effective 1 September 2017.
   (strikethrough = deleted text; underline = new text.)

Advisor: See Faculty of Science, Academic Advisors

This Academic Plan, which offers the Honours Chemistry courses integrated with five four-month work terms, extends over four and two-thirds years. Students work and study in alternate terms starting at the end of the 2A term. There is a double work term between terms 3B and 4A. For students studying in the co-op format, find detailed information on co-op Co-op program information requirements are located in the Co-operative Education and Career Action section of the calendar and in the Science Faculty work term report guidelines. WatPD course information is located on the Professional Development web site. Students work and study in alternate terms starting at the end of the 2A term. There is a
Continuance in Honours Co-operative Chemistry requires a cumulative overall average of 60%. In addition, students must achieve a 60% average in all Chemistry lecture courses. In order to graduate with an Honours Co-operative Chemistry degree, the following requirements must be successfully completed:

1. Completion of 24.0 units, with 20.0 lecture units (including CHEM 494A/CHEM 494B) and 4.0 lab units.
2. In Years Three and Four, students must choose five Chemistry courses from the list of Technical Electives with Chemistry content. Consult the Chemistry Department website or plan advisor for a current list of courses that qualify as technical electives.
3. Normally, full-time enrolment in Years Two, Three and Four.
4. No more than 3.0 "SCI-labelled" units will be allowed toward this Academic Plan.
5. At least one of the electives in this program must be a Mathematics course (e.g., AMATH, CO, MATH, PMATH, STAT). Contact the plan advisor for a list of recommended courses.
6. A minimum of four work terms, and submission of a minimum of four satisfactory work reports.
7. At least two of the electives in this program must be lecture courses chosen from those offered in the Faculties of Arts or Environment. Students are encouraged to include in their Academic Plan an ethics course such as STV 100, PHIL 215, PHIL 221.
8. Students may seek Departmental consent to take CHEM 495, CHEM 496, or CHEM 497 in place of CHEM 494A/CHEM 494B plus three electives.
9. Failure in more than two Chemistry lecture courses will result in a requirement to withdraw from the Academic Plan. Students may petition for re-admission; such re-admission is at the discretion of the Chemistry Undergraduate Committee. There must be exceptional circumstances to justify re-admission.
10. Mandatory courses as listed below.
11. Completion of the English Language Proficiency Requirement.

1. 22.0 units that include:
   a. 9.0 units of required CHEM courses: CHEM 100, CHEM 120, CHEM 120L, CHEM 123, CHEM 123L, CHEM 140, CHEM 200, CHEM 212, CHEM 220, CHEM 220L, CHEM 221, CHEM 233, CHEM 240, CHEM 250L, CHEM 254, CHEM 264, CHEM 265, CHEM 265L, CHEM 313L, CHEM 356, CHEM 494A, and CHEM 494B;
   b. 1.0 unit of required MATH courses: MATH 127 and MATH 128;
   c. 1.5 units of required PHYS courses: PHYS 111/111L or PHYS 121/121L and PHYS 112/112L or PHYS 122/122L;
   d. 10.5 electives distributed as follows:
      i. 5.0 units of CHEM from the list of Program Electives with the following additional restrictions:
         1. a minimum of 1.0 lab unit from CHEM 224L, CHEM 310L, CHEM 350L, and CHEM 360L;
         2. a minimum of 1.5 lecture units from CHEM 310, CHEM 313, CHEM 323, CHEM 350, and CHEM 360, with a minimum of 0.5 unit chosen from CHEM 310 and CHEM 313;
         3. a minimum of 2.0 lecture units from 400-level courses;
      ii. 0.5 unit chosen from AMATH, CO, MATH, PMATH, or STAT courses. Students should contact the academic plan advisor for a list of recommended courses;
      iii. 1.0 unit chosen from lecture courses offered in the Faculties of Arts or Environment. Students are encouraged to include in their Academic Plan an ethics course such as STV 100, PHIL 110B, PHIL 215, PHIL 221;
4.0 units chosen from any 0.5 unit lecture or lab course;
2. Full-time enrolment in Years Two, Three and Four.
3. A minimum of four work terms, submission of a minimum of four satisfactory work reports (including PD11), and, credit in four WatPD courses (PD1, PD11 and two other PD courses).
4. The English Language Proficiency Requirement.

Additional Program Conditions:
1. Maximum of 3.0 units of SCI-labelled courses can be used toward the Honours Co-operative Chemistry degree.
2. Maximum of two failures in CHEM courses are allowed. Failure in more than two CHEM courses will result in the requirement to withdraw from the academic plan. Students may petition for re-admission to the plan. There must be exceptional circumstances to justify re-admission.

Students can build strength in a specific focus area by directing their Program Electives in Year Two and Year Three towards specific courses, as described below. By doing so, students will be adequately prepared for 400-level courses in those areas. Students interested in pursuing graduate studies in Chemistry should build strength in at least two focus areas.

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</table>

Recommended Course Sequence

Year One
1A Fall
CHEM 100 Introduction to Chemical Sciences
CHEM 120/CHEM 120L Physical and Chemical Properties of Matter/Laboratory
MATH 127 Calculus 1 for the Sciences
PHYS 111/PHYS 111L Physics 1/Physics 1 Laboratory or PHYS 121/PHYS 121L Mechanics/Laboratory
Two electives (1.0 unit)

1B Winter
CHEM 123/CHEM 123L Chemical Reactions, Equilibria and Kinetics/Laboratory
CHEM 140 Introduction to Scientific Calculations
MATH 128 Calculus 2 for the Sciences
PHYS 112/PHYS 112L Physics 2/Physics 2 Laboratory or PHYS 122/PHYS 122L Waves, Electricity and Magnetism/Laboratory
One elective (0.5 unit)

Year Two
2A Fall
CHEM 209 Introductory Spectroscopy and Structure
CHEM 200 Introduction to Laboratory Techniques
CHEM 220/CHEM 220L Analytical Chemistry 1/Laboratory
CHEM 240 Mathematical Methods for Chemistry
CHEM 250L Physical Chemistry Laboratory 1
CHEM 264 Organic Chemistry 1
One elective (0.5 unit)

2B Spring
CHEM 212 Structure and Bonding
CHEM 221 Analytical Chemistry 2
CHEM 244L Analytical Chemistry Laboratory 2
CHEM 254 Introductory Chemical Thermodynamics
CHEM 265/CHEM 265L Organic Chemistry 2/Laboratory
One elective (0.5 unit)

Note:
Students may choose to take CHEM 233 in place of an elective in the Spring term to decrease the number of required Chemistry courses in Year 3A Winter term.

Year Three
3A Winter
CHEM 233 Fundamentals of Biochemistry (or an additional elective if CHEM 233 has been taken in Year 2B)
CHEM 313/CHEM 313L Main Group and Solid State Chemistry/Laboratory Inorganic Chemistry Laboratory 1
CHEM 350 Chemical Kinetics
CHEM 360/CHEM 360L Organic Chemistry 3/Laboratory
One Four electives (0.5-2.0 units)

3B Fall
CHEM 310/CHEM 310L Transition Element Compounds and Inorganic Materials/Laboratory
CHEM 323 Analytical Instrumentation
CHEM 350L Physical Chemistry Laboratory 2
CHEM 356 Introductory Quantum Mechanics
Two Four electives (1.0-2.0 units)

Year Four
Fall
CHEM 494A Research Project
CHEM 494B Research Project
Four electives (2.0 units)
Eight electives (4.0 units)

Winter
CHEM 494B Research Project
Four electives (2.0 units)

Rationale: See rationale for item #3.

Faculty of Science
Chemistry

5. **Motion**: To approve changes to the honours co-operative medicinal chemistry plan as presented and effective 1 September 2017.
Advisor: See Faculty of Science, Academic Advisors

Medicinal Chemistry is the science of drug discovery. Students in this program will be trained as chemists but will additionally be provided with training that is appropriate for careers in the design, synthesis and evaluation of potential drug candidates.

This Academic Plan is integrated with five four-month work terms and extends over four and two-thirds years. Students work and study in alternate terms starting at the end of the 2A term. There is a double work term between terms 3B and 4A. Co-op program requirement information is located in the Co-operative Education and Career Action section of the calendar and in the Science Faculty work term report guidelines. WatPD course information is located on the Professional Development website. Continuance in Honours Co-operative Medicinal Chemistry requires a cumulative overall average of 60%. In addition, students must achieve a 60% average in all Chemistry lecture courses.

Detailed information can be found on co-op program requirements in the Co-operative Education and Career Action section of the undergraduate calendar and in the Science Faculty work term report guidelines.

Failure in more than two Chemistry lecture courses will result in a requirement to withdraw from the Academic Plan. Students may petition for readmission; such readmission is at the discretion of the Chemistry Undergraduate Committee. There must be exceptional circumstances to justify readmission.

In order to graduate from the Honours Co-operative Medicinal Chemistry program, the following requirements must be successfully completed:

1. Completion of 24.0 units, with 20.0 lecture units (including CHEM 494A/CHEM 494B), and 4.0 lab units.
2. Normally, full-time enrolment in Years Two, Three and Four.
3. A minimum of four work terms, and submission of a minimum of four satisfactory work reports.
4. It is recommended that at least one elective in this program be a lecture course chosen from those offered in the Arts or Environment faculties. An ethics course, such as STV 100, PHIL 215, PHIL 221 is recommended.
5. Mandatory courses as listed below.
6. Completion of the English Language Proficiency Requirement.

1. 22 units that include:
   b. 1.0 unit of required MATH courses: MATH 127 and MATH 128;
   c. 1.5 units of required PHYS courses: PHYS 111/111L or PHYS 121/121L and PHYS 112/112L or PHYS 122/122L;
   d. 0.5 unit of required BIOL courses: BIOL 130
   e. 5.0 elective units distributed as follows:
      i. 3.0 units of CHEM from the list of Program Electives with a minimum of 2.0 lecture units from 400-level courses;
      ii. 1.0 unit chosen from lecture courses offered in the Faculties of Arts or Environment. Students are encouraged to include in their Academic Plan an ethics course such as STV 100, PHIL 110B, PHIL 215, PHIL 221;
iii.  1.0 unit chosen from any 0.5 unit lecture or lab course.

2. Full-time enrolment in Years Two, Three and Four.

3. A minimum of four work terms, submission of a minimum of four satisfactory work reports (including PD1), and, credit in four WatPD courses (PD1, PD11 and two other PD courses).

4. The English Language Proficiency Requirement.

Additional Program Conditions:

1. Maximum of two failures in CHEM courses are allowed. Failure in more than two CHEM courses will result in the requirement to withdraw from the academic plan. Students may petition for re-admission to the plan. There must be exceptional circumstances to justify re-admission.

Recommended Course Sequence

Year One

1A Fall
BIOL 130 Introductory Cell Biology
CHEM 100 Introduction to Chemical Sciences
CHEM 120/CHEM 120L Physical and Chemical Properties of Matter/Laboratory
MATH 127 Calculus 1 for the Sciences
PHYS 111/PHYS 111L Physics 1/Physics 1 Laboratory
or PHYS 121/PHYS 121L Mechanics/Laboratory
One elective (0.5 unit)

1B Winter
CHEM 123/CHEM 123L Chemical Reactions, Equilibria and Kinetics/Laboratory
CHEM 140 Introduction to Scientific Calculations
MATH 128 Calculus 2 for the Sciences
PHYS 112/PHYS 112L Physics 2/Physics 2 Laboratory
or PHYS 122/PHYS 122L Waves, Electricity and Magnetism/Laboratory
One elective (0.5 unit)

Year Two

2A Fall
CHEM 209 Introductory Spectroscopy and Structure
CHEM 200 Introduction to Laboratory Techniques
CHEM 220/CHEM 220L Intro Analytical Chemistry/Laboratory
CHEM 240 Mathematical Methods for Chemistry
CHEM 250L Physical Chemistry Laboratory 1
CHEM 264 Organic Chemistry Laboratory 1
One elective (0.5 unit)

2B Spring
CHEM 212 Structure and Bonding
CHEM 221 Multi-Component Analysis
CHEM 224L Analytical Chemistry Laboratory 2
CHEM 233 Fundamentals of Biochemistry
CHEM 254 Introductory Chemical Thermodynamics
CHEM 265/CHEM 265L Organic Chemistry 2/Laboratory

Year Three

3A Winter
CHEM 313/CHEM 313L Main Group and Solid State Chemistry/Laboratory
Inorganic Chemistry Laboratory 1
CHEM 340 Introductory Computational Chemistry
CHEM 350 Chemical Kinetics
CHEM 360/CHEM 360L Organic Chemistry 3/Laboratory
CHEM 381 Medicinal and Bioorganic Chemistry

3B Fall
CHEM 310/CHEM 310L Transition Element Compounds and Inorganic Materials/Laboratory
CHEM 323 Analytical Instrumentation
CHEM 331 Fundamentals of Metabolism 1
CHEM 356 Introductory Quantum Mechanics
CHEM 382L Advanced Organic Synthesis Laboratory
CHEM 383 Medicinal Chemistry
One elective (0.5 unit)

Year Four
CHEM 430 Special Topics in Biochemistry (Biochemical Pharmacology)
CHEM 432 Metabolism 2
CHEM 460 (1.0 unit) Two courses in: Special Topics in Organic Chemistry
CHEM 464 Spectroscopy in Organic Chemistry
CHEM 481 Rational Design of Potential Drug Candidates
CHEM 482 Advanced Topics in Medicinal Chemistry
CHEM 494A Research Project
CHEM 494B Research Project
One elective (0.5 unit)
Six electives (3.0 units)

Note: A synthetic organic chemistry CHEM 400 course must be taken as one of the fourth year program electives. Not all of the courses offered in the CHEM 400 series can be counted towards the Medicinal Chemistry program. Students should consult the Academic Advisor for more information about which courses can be counted.

Rationale: See rationale for item #3.

Global Experience Certificate

6. Motion: To approve deferral of the changes to the global experience certificate as presented in Attachment #3 by one year, from 1 September 2016 to 1 September 2017.

Rationale: In September 2015, Senate passed a motion that added the requirement of completing three online modules to earn the global experience certificate. The recent re-organization of Waterloo International has had an impact on the development and assessment of these modules, and so it is considered to be prudent to defer the implementation of this plan for one year (from September 2016 to September 2017). Further recommendations stemming from these developments are expected to be brought forward in the next year. Students enrolling in the certificate in 2016-17 will not require the proposed modules under development.

Mario Coniglio
Associate Vice-President, Academic
THIS AGREEMENT FOR UNDERGRADUATE EDUCATIONAL COLLABORATION made this [insert date] day of [insert month], 20[...] (the “Effective Date”)

BETWEEN:

HEFEI UNIVERSITY OF TECHNOLOGY, a university established under the laws of the People’s Republic of China, with its main campus located at 193 Tunxi Rd, Baohe, Hefei, Anhui, China. (“HFUT”)

AND

UNIVERSITY OF WATERLOO, a university established by an Act of the Legislature of the Province of Ontario, with its main campus located at 200 University Avenue West, Waterloo Ontario, Canada N2L 3G1. (“Waterloo”)

The parties to this agreement wish to establish a collaborative undergraduate program in Science (the “Program”) where students will spend two years at HFUT’s campus in China and two years at Waterloo’s campus in Canada.

Benefits of the Program for Waterloo are to: increase opportunities for Chinese students to experience Canadian higher education; promote Waterloo’s international reputation; increase interaction with Chinese universities; expose Waterloo’s students to Chinese culture and customs through interaction with HFUT’s students; and attract the most talented students worldwide.

Benefits of the Program for HFUT are to: promote HFUT’s international reputation; increase interaction with Canadian universities; enhance HFUT’s ability to attract top students; expose HFUT’s students to Canadian culture and customs; and enhance the ability of HFUT’s graduates to compete in the national and international job markets;

The parties therefore agree as follows:

1. **Admissions**
   1.1. Potential participants (“Applicants”) will apply for admission to HFUT through its standard procedures in any of its eligible programs.

   1.2. Waterloo and HFUT will work together to select up to 20 Applicants each year to participate in the Program.

      1.2.1. HFUT will pre-select Applicants according to qualification criteria established by Waterloo.

      1.2.2. HFUT is responsible for making Applicants aware of the Program in order to attract the most talented students.
1.3. Admission decisions will be made by each university in accordance with this agreement, subject to each university’s policies, procedures and regulations in effect at the time of the decision.

1.3.1. Applicants will apply to the following eligible undergraduate programs at Waterloo:

Faculty of Science: Biology, Biochemistry, Biomedical Sciences, Chemistry, Environmental Science, Earth Sciences, Mathematical Physics, Materials and Nanosciences, and Physics.

1.3.2. Application forms for admission to Waterloo are currently available at: http://horizon.ouac.on.ca/uw/agreements/

1.3.3. Waterloo admission deadlines and required supporting documents are subject to change. Waterloo will advise HFUT of relevant deadlines on an annual basis.

1.3.4. Waterloo reserves the right to refuse Applicants based on space limitations of the Program, fiscal constraints, an Applicant’s failure to meet admission standards, or external factors such as failure of the Applicant to obtain a valid student visa.

1.3.5. Minimum admission requirements to Waterloo programs include both English Language Proficiency (“ELP”) and program specific academic requirements.

1.4. Applicants are responsible for all relevant application fees at each university unless they are waived by either university.

2. Eligibility

2.1. Students wishing to enter the Program must obtain qualifying grades satisfactory to both universities.

2.2. Before entering Waterloo for study, Participating Students must:

2.2.1. Successfully complete the first two years of jointly recognized curriculum, including completing all courses with a minimum grade of 70%; and

2.2.2. Meet ELP standards established by Waterloo as described in section 8 of this agreement.

3. Registration and Required Residence

3.1. If an Applicant satisfies all conditions to admission to Waterloo except for ELP requirements, Waterloo will provide the Applicant with a conditional letter of acceptance, subject to fulfillment of Waterloo’s ELP requirements and satisfactory performance on a Waterloo approved ELP test for the relevant program as described in Waterloo’s Undergraduate Academic Calendar.

3.2. Applicants who satisfy all of the academic and ELP requirements set out in this agreement (“Participating Students”), will be issued an unconditional letter of acceptance.
3.3. Applicants who are accepted to Waterloo will be responsible for maintaining continuous registration at both universities.

3.4. The Program is designed for completion within four years of full-time study comprised of two years of full-time residence at HFUT followed by four full-time academic terms in residence at Waterloo. The actual length of study at Waterloo will depend on the number of transfer credits earned and the number of courses a Participating Student takes each term.

3.5. Part-time enrolment in the Program is not permitted.

3.6. Waterloo is solely responsible for decisions regarding Participating Students’ progression in years three and four of the Program.

4. Tuition and Expenses
4.1. Participating Students will pay tuition and incidental fees to the university at which they are in residence, as set by that university according to its usual procedures. While at Waterloo, Participating Students will be charged according to the relevant international student tuition standard.

4.2. Participating Students are solely responsible for any and all expenses incurred under this agreement including travelling, living and accommodation, books, medical care, ELP training and personal expenses.

4.3. Participating Students are solely responsible for obtaining the necessary travel and study documents (e.g., passport and study visa) and for any and all related expenses.

4.4. All Participating Students and faculty who travel to Waterloo as part of the Program must maintain appropriate health insurance (and other insurance, if required) while in resident at Waterloo.

4.5. All Participating Students studying at Waterloo are required to maintain coverage from the University Health Insurance Plan (UHIP) and UW’s FEDS/GSA Health and Dental Plan during the period of residence at Waterloo.

4.6. At Waterloo’s discretion, Participating Students may be awarded Waterloo entrance awards. Selection will be based on high academic standing.

4.7. While resident at Waterloo, Participating Students are entitled to apply for any scholarship or bursary funds for which they are eligible.

5. Academic Regulations. Participating Students must comply with the regulations of the university at which they are then resident, including those governing academic and non-academic misconduct, and the ethical conduct of research.

6. Records
6.1. Each university will maintain official records for Participating Students during their time of residence.
6.2. Participating Students will be issued official transcripts by each university as appropriate.

6.3. Subject to applicable laws or regulations regarding privacy and access to student information, each university will transmit to the other:

6.3.1. Grades for all courses completed or attempted by Participating Students and

6.3.2. Discipline case summaries when a penalty has been imposed.

7. Transfer Credits and Degree Completion
7.1. Waterloo will grant transfer credits for the first two years of course work to Participating Students who obtain marks that are at, or above, 70% in examinations set by HFUT. Only courses that qualify as either core or electives in the relevant program at Waterloo will be considered for transfer, to a maximum of 10.0 credit units (or 20 semester courses), plus any transferable lab credits.

7.2. HFUT will provide sufficient course information, including typical exam questions and student responses, to allow Waterloo to determine which of its courses qualify for Waterloo transfer credits.

7.3. Where possible, HFUT will incorporate courses, information and materials from Waterloo into its curricula in order to help Participating Students to meet Waterloo prerequisites for upper year courses.

7.4. Waterloo will issue the appropriate Honours Bachelor’s Degree to Participating Students who successfully fulfill all degree requirements, including requirements relating to enrolment, progression and coursework.

7.5. HFUT agrees to accept returning Participating Students who cannot, for academic or other reasons, continue their study at Waterloo. For any Participating Students who return having not completed Waterloo degree requirements, HFUT will assess successfully completed Waterloo courses for possible credit transfer, so that these courses may count towards degree completion at HFUT.

8. English Language Proficiency Training
8.1. Waterloo’s English language proficiency requirements for international students are outlined on Waterloo’s admissions website (www.findoutmore.uwaterloo.ca).

8.2. Where possible, HFUT will create opportunities for Participating Students and encourage them to take part in extracurricular English language training while resident at HFUT.

8.3. Waterloo will send staff to examine and interview Applicants during the fall of their second year at HFUT for English language skills. Waterloo will be responsible for travel and living expenses of its staff while visiting HFUT. Emphasis will be on assessing Participating Students’ potential for success in academic programs at Waterloo and ability to understand and communicate effectively in English.
8.4. Waterloo will coordinate placement of Participating Students who satisfy all conditions for admission in level 300 of the 6-week English for Academic Success (“EFAS”) program offered through Renison University College.

8.5. Participating Students who are exempt from providing an ELP test score, as well as those who have successfully met one of the ELP test criteria, as published in Waterloo’s Undergraduate Studies Academic Calendar, are exempt from completing the EFAS program. Participating Students who achieve at least 80% on the Renison College Placement Test will not be required to complete this requirement, although they are strongly encouraged to take part in the program.

8.6. Participating Students who qualify are responsible for applying, enrolling in and attending the EFAS program, which will begin in mid- or late July.

8.7. Participating Students are responsible for all costs associated with the English language training.

8.8. Students whose English skills meet the standards set for academic study at Waterloo at the end of the EFAS program will enroll in their program of study at Waterloo in early September. Students who require additional intensive language training will have their enrollment deferred for up to one term until their English skills meet the standards.

9. Faculty Co-operation

9.1. Waterloo and HFUT will encourage their respective faculty to take part in teaching exchanges and research collaborations with one another.

9.2. Waterloo and HFUT will work together to facilitate curriculum compatibility in support of the Program.

9.2.1. Waterloo will train one faculty member from HFUT to facilitate curriculum compatibility of HFUT and Waterloo.

9.2.2. The duration of the training will normally be three or four weeks on Waterloo’s campus.

9.2.3. Neither Party will be responsible for any expenses incurred by visiting faculty from the other, including travel, living and accommodation, medical care nor personal expenses, except as may be arranged on a case by case basis.

10. Term and Termination.

10.1. The Term of this agreement will commence on the Effective Date and continue for a period of five years, unless terminated earlier in accordance herewith. The agreement will automatically renew for subsequent five year periods unless a party delivers at least 12 months’ prior written notice of termination to the other party in accordance with this section.

10.2. This agreement may be terminated by either party at any time upon 12 months’ written notice, provided that: (i) the termination shall not affect any other contracts between the parties (including, but not limited to exchange agreements) and any such other contracts shall be completed in accordance with their terms;
and (ii) the termination shall not affect any Participating Students in good standing in the Program, who will be permitted to complete the Program in accordance with the terms of this agreement.

10.3. If a party elects to terminate this agreement pursuant to this section, all Program arrangements will cease on the effective date of the termination, save and except for arrangements regarding Participating Students in the process of completing the Program as described above. Any changes or accommodations required to permit Participating Students to complete the Program will be negotiated in good faith.

10.4. This agreement may be amended or modified at any time by mutual written consent of the parties. Any such amendments or modifications will take the form of letters of agreement signed by all parties in support of this agreement.

11. Designated Representatives. Each party will appoint a Designated Representative for co-ordination and administration of this agreement. The universities may change their Designated Representatives at any time by providing written notice.

The Designated Representative(s) for Waterloo are:

Dr. Shoufa Lin
Faculty of Science
University of Waterloo, Ontario, Canada N2L 3G1
Telephone: (519) 888-4567 ext. 36557
Email: Shoufa@uwaterloo.ca

Drew Knight
Director, Global Research and Strategic Alliances & International Liaison Officer, Waterloo International and Office of Research
University of Waterloo, Ontario, Canada N2L 3G1
Telephone: (519) 888-4567 ext. 32288
Email: dknight@uwaterloo.ca

The Designated Representative for HFUT is:

Huang Jinhua
International Education College
Hefei University of Technology
193 Tunxi Road, Hefei, Anhui, P.R.China, 230009
Telephone: (+86) 551 62901076
Fax: (+86) 551 62905565
Email: jinjin@hfut.edu.cn

Study Abroad Coordinator
International Education College
Hefei University of Technology

Any notice to be given under this Agreement should be in writing and addressed to:

Contact Person for Waterloo: Study Abroad Manager, Waterloo International

Contact Person for HFUT is: Study Abroad Coordinator, International Education College

Notice will be deemed given (i) when verified by written receipt if sent by courier, or when received if sent by mail without verification of receipt or (ii) when verified by automated receipt or electronic logs if sent by facsimile or email. Notices sent by facsimile or email should be followed as soon as possible by original signed documents.

13. Other Terms and Conditions

13.1. Disruption of Academic Activity. In the event of a disruption of academic activity at either university, the parties, through their Designated Representatives, will negotiate in good faith in the interest of the Participating Students to enable them to complete the Program.

13.2. Non-Exclusivity. This agreement in no way restricts the universities from participating in similar activities or arrangements with others.

13.3. News Releases. Any public announcements or new releases resulting from this agreement should be coordinated with Waterloo’s Office of Communications and Public Affairs.

13.4. Dispute Resolution. Any disputes in connection with this agreement should be settled by negotiation between the universities through their Designated Representatives.

13.5. Independent Institutions. Nothing contained in this agreement should be construed to create or imply a joint venture, partnership, principal-agent or employment relationship between the universities.

13.6. Governing Law. This agreement shall be exclusively governed by, and construed in accordance with, the laws of the Province of Ontario, and the federal laws of Canada applicable therein, without regard to its laws regarding conflicts of laws.

13.7. Counterparts. This agreement may be executed in one or more identical counterparts, each of which shall be deemed an original, but all of which taken together constitute one and the same instrument.

13.8. Indemnification. Each Institution shall at all times indemnify and hold harmless the other against all claims, actions, loss or damage arising from the indemnifying party's performance or lack of
performance under the Agreement or the acts of commission or omission of its employees, agents or students while carrying out this Agreement.

The parties have executed this agreement on the dates shown hereunder.

Dated at Waterloo, Ontario, Canada this day of , 2016

UNIVERSITY OF WATERLOO

per: _________________________________________
Dr. Feridun Hamdullahpur, President & Vice-Chancellor

per: _________________________________________
??, Associate Vice-President, International

per: _________________________________________
Dr. Robert P. Lemieux, Dean of Science

Dated at Hefei, Anhui this day this day of , 2016

HEFEI UNIVERSITY OF TECHNOLOGY

per: _________________________________________
Prof. Liang Liang, President

per: _________________________________________
Prof. Tan Jieqing, Dean, International Education College
The field of electrical and computer engineering is multidisciplinary and based on foundations in science, mathematics, and computing—both hardware and software. Reflecting this diversity, the Department of Electrical and Computer Engineering (ECE) offers these two broad programs but is also a major partner in offering four more interdisciplinary programs, in Biomedical Engineering, Mechatronics Engineering, Nanotechnology Engineering, and Software Engineering. The Computer Engineering and Electrical Engineering programs, described here, span the field in slightly different ways to give students a deep base of core knowledge with the ability to focus in one or more target areas. Students completing either program should gain the breadth of understanding necessary for lifelong learning in any area of electrical and computer engineering regardless of their choice of upper-year electives.

The fields of Computer Engineering and Electrical Engineering have co-evolved over the past several decades into an exciting interwoven tapestry of ten thematic subdisciplines, all sharing common foundations from science, mathematics, and computing. Students in either program study those shared foundations and a portion of each theme to gain the breadth and depth of understanding necessary for lifelong learning in any area of computer or electrical engineering.

The Computer Engineering and Electrical Engineering programs start out pre-structured to span the ten themes in slightly different ways while still allowing flexibility for students to choose the full depth of study in any subdiscipline or to switch between the two programs. Within the specified framework of study, students make, according to their developing interests, choices to define their technical focus, choices regarding how they enhance their science background, and choices to expand their non-technical knowledge or skills. The goal is to graduate students with solid core engineering competencies but highly customizable depth, breadth, and focus. They are employed in an extremely varied set of occupations, essentially any place where there is design activity involving electricity, electronics, computers, or software.

The Department of Electrical and Computer Engineering (ECE), which administers the Computer Engineering and Electrical Engineering programs, is itself a richly diverse unit and is a partner in offering four other interdisciplinary undergraduate programs, namely Biomedical Engineering, Mechatronics Engineering, Nanotechnology Engineering, and Software Engineering.

The following thematic subdisciplines are covered in varying degrees by the two programs.

ECE identifies ten overlapping target areas in the discipline as listed below.

1. Communications, modulation and coding, multimedia, and wireless systems.
2. Networks, and mobility, mobile/distributed computing.
3. Energy distribution, motors/generators, power electronics, and energy marketing.
4. Control, automation, robotics, and mechatronics.
5. Digital Computer architectures, embedded computers, and formal specification and design.
7. Microwave (radio frequency) or photonic devices and systems.
8. Signal processing, computational intelligence, and soft computing.
10. Software engineering, requirements specification, software architectures, and verification.

Common elements of mathematics, science, and computing permeate these areas and tie them together with a concentration on engineering science (analysis) and engineering design (synthesis). All students in both programs receive a core knowledge of the ten areas. Computer Engineering puts relatively more emphasis on digital hardware, embedded systems, software systems, and networks. Electrical Engineering puts relatively more emphasis on microwave/photonic systems, devices/fabrication, microelectronic circuits, and power. Students who decide to focus in a target area not emphasized in their program may need to take an extra course. However, the programs are also structured to make it easy to transfer from one to the other if the student
develops interests for which this would be the best path. Because of commonalities between core offerings in either program, it is relatively easy to transfer from one to the other, especially during the first three terms of study.

The programs have elective choices in a wide array of non-technical fields, in technical areas both inside and outside of ECE, and in science. Engineered systems based on electronics or embedded computers are especially pervasive across most areas of society and it is increasingly important for students to be able to integrate their technical abilities with other requirements: complementary skills. Teamwork and interdisciplinary collaboration are important aspects of the program common. The programs place a significant emphasis on communication skills, design, and engineering professionalism. Broad-minded and deeply-trained students of computer or electrical engineering will make important contributions over the next several decades as the world addresses potential issues such as environmental quality, energy supply, better health care, etc.

The ECE Department administers the Computer Engineering and Electrical Engineering programs and staffs committees and staff supporting curriculum development, program operation, and student advisement. Help and information are available by contacting the ECE Undergraduate Office or browsing the ECE website.

Academic Curricula

The programs involve a prescribed course load in each term along with some academic milestones which must be completed at or before specified times. Laboratory meets sessions are compulsory where they form part of a course. Approval from the ECE Undergraduate Office is required for all changes from the specified programs. Permission to carry more than the normal load in any term is at the discretion of the ECE Undergraduate Office and is dependent on both the student's previous term average and their cumulative average.

There are six co-operative work terms and the normal rules of The Co-operative Education System apply, as further described in the Engineering Work Terms section of the calendar. With permission and co-ordination through the ECE Undergraduate Office, it is possible to create eight-month co-operative work terms by rearranging the term sequence. At least five successful work terms are required to meet the degree requirements.

The promotion criteria used to determine progression through the program, in either Computer Engineering or Electrical Engineering, are described in the Engineering Examinations and Promotions section. These include term-average requirements, course-grade requirements, and milestone requirements.

The tables below outlines the contents of the eight academic terms and six co-operative work terms. The ordering of the terms is as described in the Study/Work Sequence section. The superscripts 8 and 4S are for information specific to Stream 8 and Stream 4S, respectively. For academic terms, the average scheduled hours per week are indicated in the columns Cls for class (LEC or SEM), Tut for tutorial (TUT), and Lab for laboratory (LAB or PRJ). Most laboratories are either open or scheduled every second or third week. In each of the three terms 2B, 3A, and 3B, there are two program-specific required courses labelled as CE for Computer Engineering or EE for Electrical Engineering. Students may take courses from the other program and some count as Technical Elective choices (see below). Further details on electives and milestones are provided below. In addition to the courses listed below, the Department will normally schedule, in terms 1B through 4B, an hour per week that is available for organizational meetings, communication with the department, make-up lectures, etc.

Notes

1. Milestones and courses with deadlines for successful completion are shown in the terms where they are normally completed. Work-term report courses (WKRPT 201, WKRPT 301, WKRPT 401) are considered milestones with deadlines for successful completion; WKRPT courses are described as type DRNC per Rule 11 in the Examinations and Promotions rules. Further information is provided in the Milestones and Deadlines section.

2. There are a total of eleven 11 elective courses. Five are technical electives, four are complementary studies electives, and two are natural science electives. Normally, students take two technical electives in 4A, three technical electives in 4B, and the others (complementary studies, natural science) in the remaining elective slots between 2B and 4B. Students may deviate from this order but must take at least the specified number of courses in each term. Electives vary in the number and type of scheduled hours per week. Out of these 11 slots, five must be filled with technical electives (TEs), four with complementary studies electives (CSEs), and two with natural science electives (NSEs). Constraints on the selection of TEs, CSEs, and NSEs are explained below. As per the Engineering Examinations and Promotions rules, these electives form part of a full course load.
3. Students may take any Professional Development (PD) course approved by the Faculty of Engineering, except for PD 22. Students must complete PD 20 and PD 21, as well as three PD elective courses to satisfy degree requirements.

4. During the 3B term, students must select a technical course from a program-specific list. Schedule permitting, the courses that are not selected may also be taken for credit and count as TEs.

5. In their 4A/4B terms, students must enrol in the ECE 498A/ECE 498B sequence or the GENE 403/GENE 404 sequence. ECE 498A/GENE 404 and ECE 498B/GENE 403 combinations are not allowed.

6. Students in the Option in Biomechanics or the Option in Mechatronics must choose a compatible topic for their design project sequence in ECE 498A, ECE 498B. See the option description or option co-ordinator for details.

7. Special topics courses (ECE 493) are offered as resources and faculty interests permit. Students should consult the ECE Undergraduate Office or ECE website for upcoming topics. Some offerings may have laboratory meets.

8. The "Electrical and Computer Engineering Practice" courses (ECE 100A, ECE 100B, ECE 200A, ECE 200B, ECE 300A, ECE 300B, ECE 400A, ECE 400B) have requirements and deadlines for successful completion. The "Work-term Report" courses (WKRPT 201, WKRPT 301, WKRPT 401) have minimal-grade requirements and deadlines for successful completion. (Courses with deadlines for successful completion are described as type DRNC [see Rule 11] in the promotion rules.)

9. Courses with deadlines for successful completion and other milestones are shown in the terms where they are normally completed. Due dates are more fully described in the Milestones and Deadlines section below.

10. The courses labelled ECE 105 and ECE 106 may be offered as PHYS courses rather than ECE courses.

11. Students can enrol in the sequence ECE 498A-498B, or the sequence GENE 403-404, in their 4A/4B terms. Combinations such as ECE 498A-GENE 404 are not allowed.

Key:

n/a translates to "not applicable"

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<th>CE or EE</th>
<th>Course/Milestone</th>
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<td><strong>ECE 204</strong></td>
<td>Numerical Methods</td>
<td>3</td>
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<tr>
<td>n/a both</td>
<td><strong>ECE 205</strong></td>
<td>Advanced Calculus 1 for Electrical and Computer Engineers</td>
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<td>n/a both</td>
<td><strong>ECE 222</strong></td>
<td>Digital Computers</td>
<td>3</td>
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<td>n/a both</td>
<td><strong>ECE 240</strong></td>
<td>Electronic Circuits 1</td>
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<td><strong>ECE 250</strong></td>
<td>Algorithms and Data Structures</td>
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<td>Engineering Profession, Ethics, and Law</td>
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<td>n/a</td>
<td><strong>MATH 215</strong></td>
<td>Linear Algebra for Engineering</td>
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<tr>
<th>Academic Term 2B</th>
<th>Spring&lt;sup&gt;8&lt;/sup&gt;, Fall&lt;sup&gt;4&lt;/sup&gt;</th>
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<td>n/a both</td>
<td><strong>ECE 200B</strong></td>
<td>Electrical and Computer Engineering Practice (see note 4)</td>
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<td><strong>ECE 207</strong></td>
<td>Signals and Systems</td>
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<td>CE</td>
<td><strong>ECE 208</strong></td>
<td>Discrete Mathematics and Logic 2</td>
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<td>CE</td>
<td><strong>ECE 224</strong></td>
<td>Embedded Microprocessor Systems</td>
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<td>n/a</td>
<td><strong>ECE 242</strong></td>
<td>Electronic Circuits 2</td>
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<td><strong>ECE 252</strong></td>
<td>Systems Programming and Concurrency</td>
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<td><strong>ECE 254</strong></td>
<td>Operating Systems and Systems Programming</td>
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<td><strong>ECE 209</strong></td>
<td>Electronic and Electrical Properties of Materials</td>
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<td><strong>ECE 260</strong></td>
<td>Electromechanical Energy Conversion</td>
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<td><strong>ECE 298</strong></td>
<td>Instrumentation and Prototyping Laboratory</td>
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<td><strong>WKRPT 201&lt;sup&gt;4&lt;/sup&gt;</strong></td>
<td>Work-term Report (see note 4)</td>
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<td>Technical Presentation Milestone</td>
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<td>n/a both</td>
<td><strong>COOP 3</strong></td>
<td>Co-operative Work Term</td>
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<tr>
<td>Academic Term 3A Winter(^8), Spring(^{4S})</td>
<td>ECE 300A</td>
<td>Electrical and Computer Engineering Practice (see note 4)</td>
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<td>ECE 301</td>
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<td>ECE 314</td>
<td>Probability Theory and Statistics</td>
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<td>CE</td>
<td>ECE 327</td>
<td>Digital Hardware Systems</td>
<td>3</td>
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<td>CE</td>
<td>ECE 351</td>
<td>Compilers</td>
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<td>EE</td>
<td>ECE 333</td>
<td>Electronic Devices</td>
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<td>EE</td>
<td>ECE 340</td>
<td>Electronic Circuits 2</td>
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<td>ECE 375</td>
<td>Electromagnetic Fields and Waves</td>
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<td>ECE 380</td>
<td>Analog Control Systems</td>
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<td>WKRPT 201(^8)</td>
<td>Work-term Report (see note 4)</td>
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<td>WKRPT 301(^{4S})</td>
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<td>One CSE, NSE, or TE (see note 2)</td>
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<td>Work Term Winter(^{4S}), Spring(^8)</td>
<td>COOP 4</td>
<td>Co-operative Work Term</td>
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<td>ECE 302</td>
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<td>both</td>
<td>ECE 390</td>
<td>Engineering Design, Economics, and Impact on Society</td>
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<tr>
<td>n/a EE</td>
<td>ECE 318</td>
<td>Analog and Digital Communications</td>
<td>3</td>
</tr>
<tr>
<td>both</td>
<td>ECE 224</td>
<td>Embedded Microprocessor Systems</td>
<td>3</td>
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<tr>
<td>EE</td>
<td>ECE 331</td>
<td>Electronic Devices</td>
<td>3</td>
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<tr>
<td>both</td>
<td>WKRPT 301(^8)</td>
<td>Work-term Report (see note 4)</td>
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<tr>
<td>both</td>
<td>WKRPT 401(^{4S})</td>
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<tr>
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<td>One elective course (see note 1)</td>
<td>One CSE, NSE, or TE (see note 2)</td>
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<tr>
<td>Technical Courses</td>
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<tr>
<td>CE</td>
<td>Choose two of the following three courses (see note 4):</td>
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<tr>
<td>CE</td>
<td>ECE 320</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>CE</td>
<td>ECE 350</td>
<td>Real-Time Operating Systems</td>
<td>3</td>
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<tr>
<td>CE</td>
<td>ECE 356</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>CE</td>
<td>Choose one of the following two courses (see note 4):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>ECE 318</td>
<td>Analog and Digital Communications</td>
<td>3</td>
</tr>
<tr>
<td>CE</td>
<td>ECE 358</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>EE</td>
<td>Choose one of the following two courses (see note 4):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>ECE 360</td>
<td>Power Systems and Smart Grids</td>
<td>3</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 373</td>
<td>Radio Frequency and Microwave Circuits</td>
<td>3</td>
</tr>
<tr>
<td>both</td>
<td>COOP 5</td>
<td>Co-operative Work Term</td>
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<td>Work Term</td>
<td>Academic Term 4A Spring</td>
<td>Work Term Fall</td>
<td>Academic Term 4B Winter</td>
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<tr>
<td>Fall</td>
<td>ECE 400A</td>
<td>ECE 400B</td>
<td>ECE 400B</td>
</tr>
<tr>
<td>Winter</td>
<td>ECE 401</td>
<td>ECE 402</td>
<td>ECE 402</td>
</tr>
<tr>
<td>ECE 498A/GENE 403</td>
<td>Engineering Design Project (see note 5 and note 6)</td>
<td>ECE 498B/GENE 404</td>
<td>Engineering Design Project (see note 5 and note 6)</td>
</tr>
<tr>
<td>both</td>
<td>Information Session</td>
<td>Information Session</td>
<td>Information Session</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>both</td>
<td>both</td>
</tr>
<tr>
<td>WKRPT 401</td>
<td>Work-term Report (see note 4)</td>
<td></td>
<td>WKRPT 401</td>
</tr>
<tr>
<td>both</td>
<td>Four elective courses, (see note 1) CSE, NSE, or TE, as necessary (see note 2)</td>
<td>Four elective courses, (see note 1) CSE, NSE, or TE, as necessary (see note 2)</td>
<td>Four elective courses, (see note 1) CSE, NSE, or TE, as necessary (see note 2)</td>
</tr>
</tbody>
</table>

**Elective Courses**

**Complementary Studies Electives**

Students are required to must complete four complementary studies elective (CSE) courses to satisfy the Complementary Studies Requirements for Engineering Students. These are in addition to those courses which that are part of the core program and contain complementary studies material, such as ECE 190, ECE 290, ECE 390, and the Professional Development (PD) sequence, and the ECE Practice sequence. The four CSE courses are to be chosen according to the following constraints.

- Two courses from List C – Humanities and Social Sciences Courses
- Two courses from any of List A – Impact Courses, List C, or List D – Other Permissible Complementary Studies Courses

Students may take up to one technique course (i.e., learning a skill or language) as part of List D. If participating in an exchange program, students may instead take up to two courses in the language of the exchange destination as part of List D. Technique courses need ECE pre-approval to be considered as complementary studies electives.

**Natural Science Electives**

Students are required to complete two natural science elective (NSE) courses. The two NSE courses must be primarily concerned with natural science and are in addition to the science components of the core programs, such as CHE 102, ECE 105 and ECE 106. Students may use the two NSE courses to broaden their understanding of the scientific basis for engineering or to add depth in their chosen target area of specialization. A student Students must select at least one from List 1 and at most one from List 2.

In addition, a student may arrange with their program advisor permission to take other natural science intensive courses, which meet the minimum natural science requirement, at another university during a co-op work term.

**List 1: Natural Science Intensive Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130 and BIOL 130L</td>
<td>Introductory Cell Biology</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>BIOL 110</td>
<td>Introductory Zoology</td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Introductory Cell Biology</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>Organismal and Evolutionary Ecology</td>
</tr>
<tr>
<td>BIOL 165</td>
<td>Diversity of Life</td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Introductory Vertebrate Zoology</td>
</tr>
<tr>
<td>BIOL 240</td>
<td>Fundamentals of Microbiology</td>
</tr>
<tr>
<td>BIOL 241</td>
<td>Introduction to Applied Microbiology</td>
</tr>
<tr>
<td>BIOL 273</td>
<td>Principles of Human Physiology 1</td>
</tr>
<tr>
<td>CHEM 123</td>
<td>Chemical Reactions, Equilibria and Kinetics</td>
</tr>
<tr>
<td>CHEM 209</td>
<td>Introductory Spectroscopy and Structure</td>
</tr>
<tr>
<td>CHEM 217</td>
<td>Chemical Bonding</td>
</tr>
<tr>
<td>CHEM 237</td>
<td>Introductory Biochemistry</td>
</tr>
<tr>
<td>CHEM 254</td>
<td>Introductory Chemical Thermodynamics</td>
</tr>
<tr>
<td>CHEM 262</td>
<td>Organic Chemistry for Engineering and Bioinformatics Students</td>
</tr>
<tr>
<td>CHEM 266</td>
<td>Basic Organic Chemistry 1</td>
</tr>
<tr>
<td>CHEM 356</td>
<td>Introductory Quantum Mechanics</td>
</tr>
<tr>
<td>CHEM 404</td>
<td>Physicochemical Aspects of Natural Waters</td>
</tr>
<tr>
<td>EARTH 121</td>
<td>Introductory Earth Sciences</td>
</tr>
<tr>
<td>EARTH 122</td>
<td>Introductory Environmental Sciences</td>
</tr>
<tr>
<td>EARTH 123</td>
<td>Introductory Hydrology</td>
</tr>
<tr>
<td>EARTH 221</td>
<td>Geochemistry 1</td>
</tr>
<tr>
<td>EARTH 270</td>
<td>Disasters and Natural Hazards</td>
</tr>
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<td>EARTH 281</td>
<td>Geological Impacts on Human Health</td>
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<td>*ECE 209</td>
<td>Electronic and Electrical Properties of Materials</td>
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<td>ENVE 275</td>
<td>Environmental Chemistry</td>
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<tr>
<td>ENVE 276</td>
<td>Environmental Biology and Biotechnology</td>
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<tr>
<td>PHYS 234</td>
<td>Quantum Physics 1</td>
</tr>
<tr>
<td>PHYS 263</td>
<td>Classical Mechanics and Special Relativity</td>
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<tr>
<td>PHYS 275</td>
<td>Planets</td>
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<tr>
<td>PHYS 280</td>
<td>Introduction to Biophysics</td>
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<td>PHYS 334</td>
<td>Quantum Physics 2</td>
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<td>PHYS 335</td>
<td>Condensed Matter Physics</td>
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<td>PHYS 375</td>
<td>Stars</td>
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<tr>
<td>PHYS 380</td>
<td>Molecular and Cellular Biophysics</td>
</tr>
<tr>
<td>SCI 238</td>
<td>Introductory Astronomy</td>
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</tbody>
</table>

**Technical Electives**

*Note that ECE 209 cannot count as an NSE for Electrical Engineering students*
Students are required to complete five technical elective (TE) courses, normally taken during the fourth-year 4A and 4B terms. At least two of the TEs must be courses chosen from ECE 406-493 or 499. Up to two TEs may be technical courses from other (non-ECE) programs; such courses must have sufficiently advanced technical content to be allowed engineering science or engineering design content to be allowed, and must be pre-approved by the ECE Undergraduate Office. Further information is available from the ECE Undergraduate Office or ECE website. Some courses of interest may require prerequisite knowledge that is not part of the core program in Computer Engineering or Electrical Engineering. Students may require extra courses or may need to seek enrolment approval from the course professor if the prerequisite knowledge was acquired by other means. Some combinations of electives may not be taken simultaneously due to timetabling conflicts.

The slate of TE courses offered by ECE for the 4A and 4B terms is under revision. There may be courses added and changes made to the content, term of offering, or meet times from what is listed below. Further information is available from the ECE Undergraduate Office or ECE website. The ECE Department makes every effort to maintain a list of technical electives that reflects the current state of electrical and computer engineering. As such, the list of electives below is subject to change from year to year, and depending on current demand.

The following TE courses are normally offered for the spring (4A) term.

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<thead>
<tr>
<th>Course</th>
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<th>Cls</th>
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<td>Digital Signal and Image Processing</td>
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<td>ECE 414</td>
<td>Wireless Communications</td>
<td>3</td>
<td>1</td>
<td>0</td>
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<tr>
<td>ECE 418</td>
<td>Communications Networks</td>
<td>3</td>
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<td>ECE 429</td>
<td>Computer Architecture</td>
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<td>ECE 432</td>
<td>Radio Frequency Integrated Devices and Circuits</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>ECE 445</td>
<td>Integrated Digital Electronics</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>ECE 452</td>
<td>Software Design and Architecture</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 454</td>
<td>Distributed Computing</td>
<td>3</td>
<td>1</td>
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<td>Embedded Software</td>
<td>3</td>
<td>1</td>
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<tr>
<td>ECE 457A</td>
<td>Cooperative and Adaptive Algorithms</td>
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<td>ECE 458</td>
<td>Computer Security</td>
<td>3</td>
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<td>1.5</td>
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<td>ECE 462</td>
<td>Electrical Distribution Systems</td>
<td>3</td>
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<td>ECE 463</td>
<td>Design and Applications of Power Electronic Converters</td>
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<td>ECE 473</td>
<td>Radio Frequency and Microwave Circuits</td>
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<td>ECE 475</td>
<td>Radio-Wave Systems</td>
<td>3</td>
<td>1</td>
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<td>ECE 481</td>
<td>Digital Control Systems</td>
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<td>ECE 486</td>
<td>Robot Dynamics and Control</td>
<td>3</td>
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<tr>
<td>ECE 493</td>
<td>Special Topics in Electrical and Computer Engineering (see note 7)</td>
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The following TE courses are normally offered for the winter (4B) term.

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<td>Algorithm Design and Analysis</td>
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<td>1</td>
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<td>ECE 409</td>
<td>Cryptography and System Security</td>
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<td>0</td>
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<td>ECE 414</td>
<td>Wireless Communications</td>
<td>3</td>
<td>0</td>
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</tr>
<tr>
<td>ECE 415</td>
<td>Multimedia Processing and Coding</td>
<td>3</td>
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<tr>
<td>ECE 416</td>
<td>Advanced Topics in Networking</td>
<td>3</td>
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<td>ECE 423</td>
<td>Embedded Computer Systems</td>
<td>3</td>
<td>1</td>
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<td>ECE 433</td>
<td>Fabrication Technologies for Micro and Nano Devices</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<td>ECE 444</td>
<td>Integrated Analog Electronics</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>ECE 451</td>
<td>Software Requirements Specification and Analysis</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 453</td>
<td>Software Testing, Quality Assurance and Maintenance</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 457B</td>
<td>Fundamentals of Computational Intelligence</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Cls</td>
<td>Tut</td>
<td>Lab</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>ECE 459</td>
<td>Programming for Performance</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 464</td>
<td>High Voltage Engineering and Power System Protection</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 467</td>
<td>Power Systems Analysis, Operations and Markets</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 474</td>
<td>Radio and Wireless Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 477</td>
<td>Photonic Devices and Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 488</td>
<td>Multivariable Control Systems</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 493</td>
<td>Special Topics in Electrical and Computer Engineering (see note 7)</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

The following project elective is offered every term. Students may take it at most once in the program as a TE course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 499</td>
<td>Engineering Project</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
</tbody>
</table>

The following courses are offered for the core program in Electrical Engineering but are considered TE courses for Computer Engineering. Students of Computer Engineering may use at most two of these courses as TE courses. Some of these courses have prerequisites that must be met in order to enrol.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 260</td>
<td>Electromechanical Energy Conversion</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 331</td>
<td>Electronic Devices</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 340</td>
<td>Electronic Circuits 2</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 360</td>
<td>Power Systems and Smart Grids</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 361</td>
<td>Power Systems and Components</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 373</td>
<td>Radio Frequency and Microwave Circuits</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 375</td>
<td>Electromagnetic Fields and Waves</td>
<td>3</td>
<td>1</td>
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</tbody>
</table>

The following courses are offered for the core program in Computer Engineering but are considered TE courses for Electrical Engineering. Students of Electrical Engineering may use at most two of these courses as TE courses. Some of these courses have prerequisites that must be met in order to enrol.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 224</td>
<td>Embedded Microprocessor Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 252</td>
<td>Systems Programming and Concurrency</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 254</td>
<td>Operating Systems and Systems Programming</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 320</td>
<td>Computer Architecture</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 327</td>
<td>Digital Hardware Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 350</td>
<td>Real-Time Operating Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>ECE 351</td>
<td>Compilers</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>ECE 356</td>
<td>Database Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 358</td>
<td>Computer Networks</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

In the 3B term, electrical engineering students must choose one of either ECE 360 or ECE 373. Schedule permitting, the course not chosen may also be taken for credit as a TE. Similarly, in the 3B term, computer engineering students must choose one of either ECE 318 or ECE 358, and two of ECE 320, ECE 350, or ECE 356. Schedule permitting, the courses not chosen may also be taken for credit as TEs.

Milestones and Deadlines

**ECE 100A/B, 200A/B, 300A/B, 400A/B**

Each of these "ECE Practice" courses must be successfully completed by the end of the academic term following the one having the scheduled meets as shown in the program table above. (Specifically, students are not allowed to enrol in any academic term beyond 1B without the credit for **ECE 100A**, beyond 2A without the credit for **ECE 100B**, beyond 2B without the credit for **ECE 100C**, beyond 3A without the credit for **ECE 100D**, and beyond 3B without the credit for **ECE 100E**.)
Technical Presentation Milestone

Normally students are not allowed to enrol in any academic term beyond 3B until the technical presentation milestone is completed. This milestone is intended to be completed met when students successfully deliver a short technical presentation during their 2B term. If unsuccessful, a second attempt is allowed during the 3A term. If still unsuccessful, students must pass a course or workshop that focuses on presentation skills (e.g., a Department approved speech-communications course or an external workshop, such as Toastmasters, with requirements approved by the Department: students should contact their program advisor). Students can use the pre-approved course or workshop to clear the technical presentation milestone; alternatively, if the course in question is eligible as a Complementary Studies Elective (CSE), students may choose to use the course as a List D CSE, but must then clear the technical presentation milestone by successfully delivering a presentation during their 3B (or, in exceptional circumstances 4A) term.

English Language Proficiency

Students at the University of Waterloo must demonstrate proficiency in the English language prior to enrolling in the 2B Academic term. Further details are described in the English Language Proficiency Requirement section. Students must achieve this milestone before entering any academic term beyond 2A.

WKRPT 201, 301, 401
Work-term Report Courses

For each of these "Work-term Report" (WKRPT) courses, the student writes a technical report based on their work-term experience and submits it for grading in the academic term following the work term. More details are found in the course descriptions for WKRPT 201, WKRPT 301, and WKRPT 401 in the Engineering Examinations and Promotions section, and from the ECE Undergraduate Office or ECE website. The reports are normally submitted in the academic terms following the 3rd, 4th, and 5th work terms, as shown in the program table below; however, students have flexibility to move each report by one work term earlier or later in the program. The following table shows the possible submission terms for each report. The normal term of submission is shown in bold. Students are not allowed to enrol in any academic term beyond the last possible submission term (shown in italics) without credit for the corresponding work-report course. [remove italics only for terms bolded and underlined in the table]

<table>
<thead>
<tr>
<th>Course</th>
<th>Work-term Experience</th>
<th>Stream-4S Submission</th>
<th>Stream-8 Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>WKRPT 201</td>
<td>2nd, 3rd, 4th</td>
<td>2A, 2B, 3A</td>
<td>2B, 3A, 3B</td>
</tr>
<tr>
<td>WKRPT 301</td>
<td>3rd, 4th, 5th</td>
<td>2B, 3A, 3B</td>
<td>3A, 3B, 4A</td>
</tr>
<tr>
<td>WKRPT 401</td>
<td>4th, 5th, 6th</td>
<td>3A, 3B, 4B</td>
<td>3B, 4A, 4B</td>
</tr>
</tbody>
</table>

Workplace Hazardous Materials Information System

Under both federal and provincial legislation, all students must take Workplace Hazardous Materials Information System (WHMIS) training. Details are described in the WHMIS Requirements section of the undergraduate calendar. Students must take Workplace Hazardous Materials Information System (WHMIS) training in order to participate in the laboratory for ECE 140 during the 1A term. Students must achieve meet this milestone in order to remain enrolled in 1A or to enrol in any academic term beyond 1A.

Available Options

The normal programs in Computer Engineering and Electrical Engineering, shown above, have been are designed to offer a well-balanced and rewarding education. Students wishing to further enrich their studies may elect to take any option (or minor or joint degree) for which they meet the eligibility requirements. See the section on Engineering Interdisciplinary Alternatives for further information. These will Options typically require extra courses and/or constrain the choice of elective courses. When taking courses from a different program, the student may need to do extra work to compensate for a different background preparation. Time beyond the normal program duration may be necessary due to the extra requirements and constraints on space or scheduling. Consult the ECE Undergraduate Office or ECE website for more information and planning assistance.
Computer Option for Electrical Engineering Students

Electrical Engineering students share much of their core program with Computer Engineering students. The Computer Option allows Electrical Engineering students to enhance their study of software and embedded systems and specialize in areas normally associated with Computer Engineering. The option consists of eleven courses: three extra, six already part of the core program for Electrical Engineering, and two fourth-year technical electives. Successful completion of these courses results in a special designation on the student's transcript. For the designation to appear on the transcript, the student must achieve an average of at least 60% in the eleven option courses and a grade of at least 50% in each of the courses in the option. To enrol in this option, a student needs to have a cumulative average of at least 80% at the end of 2A.

The following nine courses are required (any course marked * can count towards the option or as a technical elective, but not both):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Core or extra</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 103</td>
<td>Discrete Mathematics</td>
<td>core</td>
</tr>
<tr>
<td>ECE 124</td>
<td>Digital Circuits and Systems</td>
<td>core</td>
</tr>
<tr>
<td>ECE 155</td>
<td>Engineering Design with Embedded Systems</td>
<td>core</td>
</tr>
<tr>
<td>ECE 222</td>
<td>Digital Computers</td>
<td>core</td>
</tr>
<tr>
<td>ECE 224</td>
<td>Embedded Microprocessor Systems</td>
<td>core</td>
</tr>
<tr>
<td>ECE 250</td>
<td>Algorithms and Data Structures</td>
<td>core</td>
</tr>
<tr>
<td>*ECE 254</td>
<td>Operating Systems and Systems Programming</td>
<td>extra (available in 2B)</td>
</tr>
<tr>
<td>*ECE 351 or 356</td>
<td>Compilers</td>
<td>extra (available in 3A)</td>
</tr>
<tr>
<td>ECE 327</td>
<td>Digital Hardware Systems</td>
<td>extra (available in 3A)</td>
</tr>
<tr>
<td>*ECE 356 or 358</td>
<td>Database Systems</td>
<td>extra (available in 3B)</td>
</tr>
<tr>
<td>*ECE 358</td>
<td>Computer Networks</td>
<td>extra (available in 3B)</td>
</tr>
</tbody>
</table>

In addition to the above nine courses, at least two of the following fourth-year courses must be chosen as technical electives. (This list is subject to change from time to time. For further information on the eligibility of a particular course, contact the option co-ordinator):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 406</td>
<td>Algorithm Design and Analysis</td>
</tr>
<tr>
<td>ECE 416</td>
<td>Advanced Topics in Networking</td>
</tr>
<tr>
<td>ECE 418</td>
<td>Communications Networks</td>
</tr>
<tr>
<td>ECE 429</td>
<td>Computer Architecture</td>
</tr>
<tr>
<td>ECE 451</td>
<td>Software Requirements Specification and Analysis</td>
</tr>
<tr>
<td>ECE 452</td>
<td>Software Design and Architectures</td>
</tr>
<tr>
<td>ECE 453</td>
<td>Software Testing, Quality Assurance and Maintenance</td>
</tr>
<tr>
<td>ECE 454</td>
<td>Distributed Computing</td>
</tr>
<tr>
<td>ECE 455</td>
<td>Embedded Software</td>
</tr>
<tr>
<td>*ECE 457A or 457B</td>
<td>Cooperative and Adaptive Algorithms, Fundsamentals of Computational Intelligence</td>
</tr>
<tr>
<td>ECE 458</td>
<td>Computer Security</td>
</tr>
<tr>
<td>ECE 459</td>
<td>Programming for Performance</td>
</tr>
</tbody>
</table>
The fields of Computer Engineering and Electrical Engineering have co-evolved over the past several decades into an exciting interwoven tapestry of ten thematic subdisciplines, all sharing common foundations from science, mathematics, and computing. Students in either program study those shared foundations and a portion of each theme to gain the breadth and depth of understanding necessary for lifelong learning in any area of computer or electrical engineering.

The Computer Engineering and Electrical Engineering programs start out pre-structured to span the ten themes in slightly different ways while still allowing flexibility for students to choose the full depth of study in any subdiscipline or to switch between the two programs. Within the specified framework of study, students make, according to their developing interests, choices to define their technical focus, choices regarding how they enhance their science background, and choices to expand their non-technical knowledge or skills. The goal is to graduate students with solid core engineering competencies but highly customizable depth, breadth, and focus. They are employed in an extremely varied set of occupations, essentially any place where there is design activity involving electricity, electronics, computers, or software.

The Department of Electrical and Computer Engineering (ECE), which administers the Computer Engineering and Electrical Engineering programs, is itself a richly diverse unit and is a partner in offering four other interdisciplinary undergraduate programs, namely Biomedical Engineering, Mechatronics Engineering, Nanotechnology Engineering, and Software Engineering.

The following thematic subdisciplines are covered in varying degrees by the two programs.

1. Communications, modulation and coding, multimedia, and wireless systems.
2. Networks, and mobile/distributed computing.
3. Energy distribution, motors/generators, power electronics, and energy marketing.
4. Control, automation, robotics, and mechatronics.
5. Computer architecture, embedded computers, and formal specification and design.
7. Microwave (radio frequency) and photonic devices and systems.
8. Signal processing, computational intelligence, and soft computing.
10. Software engineering, requirements specification, software architectures, and verification.

Common elements of mathematics, science, and computing permeate these areas and tie them together with a concentration on engineering science (analysis) and engineering design (synthesis). Computer Engineering puts relatively more emphasis on digital hardware, embedded systems, software systems, and networks. Electrical Engineering puts relatively more emphasis on microwave/photonic systems, devices/fabrication, microelectronic circuits, and power. Because of commonalities between core offerings in either program, it is relatively easy to transfer from one to the other, especially during the first three terms of study.

The programs have elective choices in a wide array of non-technical fields, in technical areas both inside and outside of ECE, and in science. Engineered systems based on electronics or embedded computers are especially pervasive across most areas of society and it is increasingly important for students to be able to integrate their technical abilities with complementary skills. Teamwork and interdisciplinary collaboration are important aspects of the program. The programs place a significant emphasis on communication skills, design, and engineering professionalism. Broad-minded and deeply-trained students of computer or electrical engineering will make important contributions over the next several decades as the world addresses potential issues such as environmental quality, energy supply, better health care, etc.

The ECE Department houses committees and staff supporting curriculum development, program operation, and student advisement. Help and information are available by contacting the ECE Undergraduate Office or browsing the ECE website.

Academic Curricula

The programs involve a prescribed course load in each term along with some academic milestones which must be completed at or before specified times. Laboratory sessions are compulsory where they form part of a course. Approval from the ECE Undergraduate Office is required for all changes from the specified programs. Permission to carry more than the normal load in any term is at the discretion of the ECE Undergraduate Office and is dependent on both the student's previous term average and their cumulative average.

There are six co-operative work terms and the normal rules of The Co-operative Education System apply, as further described in the Engineering Work Terms section of the calendar. With permission and co-ordination through the ECE Undergraduate Office,
it is possible to create eight-month co-operative work terms by rearranging the term sequence. At least five successful work terms are required to meet the degree requirements.

The promotion criteria used to determine progression through the program, in either Computer Engineering or Electrical Engineering, are described in the Engineering Examinations and Promotions section. These include term-average requirements, course-grade requirements, and milestone requirements.

The tables below outline the contents of the eight academic terms and six co-operative work terms. The ordering of the terms is as described in the Study/Work Sequence section. The superscripts 8 and 4S are for information specific to Stream 8 and Stream 4S, respectively. For academic terms, the average scheduled hours per week are indicated in the columns Cls for class (LEC or SEM), Tut for tutorial (TUT), and Lab for laboratory (LAB or PRJ). Most laboratories are either open or scheduled every second or third week. Further details on electives and milestones are provided below. In addition to the courses listed below, the Department will normally schedule, in terms 1B through 4B, an hour per week that is available for organizational meetings, communication with the department, make-up lectures, etc.

Notes

1. Milestones and courses with deadlines for successful completion are shown in the terms where they are normally completed. Work-term report courses (WKRPT 201, WKRPT 301, WKRPT 401) are considered milestones with deadlines for successful completion; WKRPT courses are described as type DRNC per Rule 11 in the Examinations and Promotions rules. Further information is provided in the Milestones and Deadlines section.

2. There are a total of 11 elective courses. Out of these 11 slots, five must be filled with technical electives (TEs), four with complementary studies electives (CSEs), and two with natural science electives (NSEs). Constraints on the selection of TEs, CSEs, and NSEs are explained below. As per the Engineering Examinations and Promotions rules, these electives form part of a full course load.

3. Students may take any Professional Development (PD) course approved by the Faculty of Engineering, except for PD 22. Students must complete PD 20 and PD 21, as well as three PD elective courses to satisfy degree requirements.

4. During the 3B term, students must select a technical course from a program-specific list. Schedule permitting, the courses that are not selected may also be taken for credit and count as TEs.

5. In their 4A/4B terms, students must enrol in the ECE 498A/ECE 498B sequence or the GENE 403/GENE 404 sequence. ECE 498A/GENE 404 and ECE 498B/GENE 403 combinations are not allowed.

6. Students in the Option in Biomechanics or the Option in Mechatronics must choose a compatible topic for their design project sequence in ECE 498A, ECE 498B. See the option description or option co-ordinator for details.

7. Special topics courses (ECE 493) are offered as resources and faculty interests permit. Students should consult the ECE Undergraduate Office or ECE website for upcoming topics. Some offerings may have laboratory meets.

<table>
<thead>
<tr>
<th>Term</th>
<th>CE or EE</th>
<th>Course/Milestone</th>
<th>Title and Notes</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Term 1A Fall</td>
<td>both</td>
<td>CHE 102</td>
<td>Chemistry for Engineers</td>
<td>3</td>
<td>1</td>
<td>0</td>
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<tr>
<td></td>
<td>both</td>
<td>ECE 105</td>
<td>Classical Mechanics</td>
<td>3</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>ECE 150</td>
<td>Fundamentals of Programming</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>both</td>
<td>ECE 190</td>
<td>Engineering Profession and Practice</td>
<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>both</td>
<td>MATH 115</td>
<td>Linear Algebra</td>
<td>3</td>
<td>2</td>
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<tr>
<td></td>
<td>both</td>
<td>MATH 117</td>
<td>Calculus 1 for Engineering</td>
<td>3</td>
<td>2</td>
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<tr>
<td></td>
<td>both</td>
<td>English Language Proficiency Milestone (see note 1)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>Workplace Hazardous Materials Milestone (see note 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Academic Term 1B Winter³, Spring⁴⁵</td>
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<td>ECE 102</td>
<td>Information Session</td>
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<tr>
<td></td>
<td>both</td>
<td>ECE 106</td>
<td>Electricity and Magnetism</td>
<td>3</td>
<td>2</td>
<td>1.5</td>
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<td></td>
<td>both</td>
<td>ECE 108</td>
<td>Discrete Mathematics and Logic 1</td>
<td>3</td>
<td>1</td>
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<td>both</td>
<td>ECE 124</td>
<td>Digital Circuits and Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<td>ECE 140</td>
<td>Linear Circuits</td>
<td>3</td>
<td>2</td>
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<td>MATH 119</td>
<td>Calculus 2 for Engineering</td>
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<td>2</td>
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<td>Work Term Winter⁴⁵, Spring⁸</td>
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<td>COOP 1</td>
<td>Co-operative Work Term</td>
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<td>PD 20</td>
<td>Engineering Workplace Skills I: Developing Reasoned Conclusions</td>
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<tr>
<td>Academic Term 2A</td>
<td>Courses</td>
<td>Credits</td>
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<td></td>
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<td>both ECE 240 Electronic Circuits 1</td>
<td>3 1 1.5</td>
<td></td>
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<tr>
<td></td>
<td>both ECE 250 Algorithms and Data Structures</td>
<td>3 1 1.5</td>
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<tr>
<td></td>
<td>both ECE 290 Engineering Profession, Ethics, and Law</td>
<td>3 1 0</td>
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<table>
<thead>
<tr>
<th>Work Term Fall, Winter</th>
<th>Courses</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>both COOP 2 Co-operative Work Term</td>
<td></td>
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</tr>
<tr>
<td>both PD 21 Engineering Workplace Skills II: Developing Effective Plans</td>
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<table>
<thead>
<tr>
<th>Academic Term 2B</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Spring, Fall</td>
<td>both ECE 202 Information Session</td>
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<tr>
<td></td>
<td>both ECE 207 Signals and Systems</td>
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<tr>
<td>CE</td>
<td>ECE 208 Discrete Mathematics and Logic 2</td>
<td>3 1 0</td>
</tr>
<tr>
<td>CE</td>
<td>ECE 224 Embedded Microprocessor Systems</td>
<td>3 1 1.5</td>
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<tr>
<td>CE</td>
<td>ECE 252 Systems Programming and Concurrency</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 206 Advanced Calculus 2 for Electrical Engineering</td>
<td>3 1 0</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 209 Electronic and Electrical Properties of Materials</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 260 Electromechanical Energy Conversion</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>both ECE 298 Instrumentation and Prototyping Laboratory</td>
<td>0 0 1.5</td>
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</tr>
<tr>
<td>both WKRPT 201 Work-term Report (see note 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>both One CSE, NSE, or TE (see note 2)</td>
<td></td>
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</tr>
<tr>
<td>both Technical Presentation Milestone</td>
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</table>

<table>
<thead>
<tr>
<th>Work Term Spring, Fall</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>both COOP 3 Co-operative Work Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>both One Professional Development Elective (see note 3)</td>
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</table>

<table>
<thead>
<tr>
<th>Academic Term 3A</th>
<th>Courses</th>
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</thead>
<tbody>
<tr>
<td>Winter, Spring</td>
<td>both ECE 301 Information Session</td>
<td>1 0 0</td>
</tr>
<tr>
<td></td>
<td>both ECE 306 Probability Theory and Statistics</td>
<td>3 1 0</td>
</tr>
<tr>
<td>CE</td>
<td>ECE 327 Digital Hardware Systems</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>CE</td>
<td>ECE 351 Compilers</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 340 Electronic Circuits 2</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 375 Electromagnetic Fields and Waves</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>both ECE 380 Analog Control Systems</td>
<td>3 1 1.5</td>
<td></td>
</tr>
<tr>
<td>both WKRPT 201 Work-term Report (see note 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>both WKRPT 301 Work-term Report (see note 1)</td>
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<tr>
<td>both One CSE, NSE, or TE (see note 2)</td>
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<table>
<thead>
<tr>
<th>Work Term Winter, Spring</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>both COOP 4 Co-operative Work Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>both One Professional Development Elective (see note 3)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Academic Term 3B</th>
<th>Courses</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall, Winter</td>
<td>both ECE 302 Information Session</td>
<td>1 0 0</td>
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<tr>
<td></td>
<td>both ECE 390 Engineering Design, Economics, and Impact on Society</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 318 Analog and Digital Communications</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>EE</td>
<td>ECE 331 Electronic Devices</td>
<td>3 1 1.5</td>
</tr>
<tr>
<td>both WKRPT 301 Work-term Report (see note 1)</td>
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<tr>
<td>both WKRPT 401 Work-term Report (see note 1)</td>
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</tr>
<tr>
<td>both One CSE, NSE, or TE (see note 2)</td>
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<td></td>
</tr>
</tbody>
</table>

Technical Courses

CE Choose two of the following three courses (see note 4):
Elective Courses

Complementary Studies Electives

Students must complete four complementary studies elective (CSE) courses to satisfy the Complementary Studies Requirements for Engineering Students. These are in addition to those courses that are part of the core program and contain complementary studies material, such as ECE 190, ECE 290, ECE 390, and the Professional Development (PD) sequence. The four CSE courses are to be chosen according to the following constraints.

- Two courses from List C – Humanities and Social Sciences Courses
- Two courses from any of List A – Impact Courses, List C, or List D – Other Permissible Complementary Studies Courses

Students may take up to one technique course (i.e., learning a skill or language) as part of List D. If participating in an exchange program, students may instead take up to two courses in the language of the exchange destination as part of List D. Technique courses need ECE pre-approval to be considered as complementary studies electives.

Natural Science Electives

Students are required to complete two natural science elective (NSE) courses. The two NSE courses must be primarily concerned with natural science and are in addition to the science components of the core programs, such as CHE 102, ECE 105 and ECE 106. Students must select at least one from List 1 and at most one from List 2.

List 1: Natural Science Intensive Courses
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 130 and BIOL 130L</td>
<td>Introductory Cell Biology</td>
</tr>
<tr>
<td>BIOL 240 and BIOL 240L</td>
<td>Fundamentals of Microbiology</td>
</tr>
<tr>
<td>BIOL 273 and BIOL 273L</td>
<td>Principles of Human Physiology 1</td>
</tr>
<tr>
<td>CHEM 123 and CHEM 123L</td>
<td>Chemical Reactions, Equilibria and Kinetics</td>
</tr>
<tr>
<td>CHEM 237 and CHEM 237L</td>
<td>Introductory Biochemistry</td>
</tr>
<tr>
<td>CHEM 262 and CHEM 262L</td>
<td>Organic Chemistry for Engineering and Bioinformatics Students</td>
</tr>
<tr>
<td>ECE 403</td>
<td>Thermal Physics</td>
</tr>
<tr>
<td>ECE 404</td>
<td>Geometrical and Physical Optics</td>
</tr>
<tr>
<td>ECE 405</td>
<td>Introduction to Quantum Mechanics</td>
</tr>
<tr>
<td>ENVS 200</td>
<td>Field Ecology</td>
</tr>
<tr>
<td>NE 122</td>
<td>Organic Chemistry for Nanotechnology Engineers</td>
</tr>
</tbody>
</table>

List 2: Natural Science Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 110</td>
<td>Introductory Zoology</td>
</tr>
<tr>
<td>BIOL 130</td>
<td>Introductory Cell Biology</td>
</tr>
<tr>
<td>BIOL 150</td>
<td>Organismal and Evolutionary Ecology</td>
</tr>
<tr>
<td>BIOL 165</td>
<td>Diversity of Life</td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Introductory Vertebrate Zoology</td>
</tr>
<tr>
<td>BIOL 240</td>
<td>Fundamentals of Microbiology</td>
</tr>
<tr>
<td>BIOL 241</td>
<td>Introduction to Applied Microbiology</td>
</tr>
<tr>
<td>BIOL 273</td>
<td>Principles of Human Physiology 1</td>
</tr>
<tr>
<td>CHE 161</td>
<td>Engineering Biology</td>
</tr>
<tr>
<td>CHEM 123</td>
<td>Chemical Reactions, Equilibria and Kinetics</td>
</tr>
<tr>
<td>CHEM 209</td>
<td>Introductory Spectroscopy and Structure</td>
</tr>
<tr>
<td>CHEM 217</td>
<td>Chemical Bonding</td>
</tr>
<tr>
<td>CHEM 237</td>
<td>Introductory Biochemistry</td>
</tr>
<tr>
<td>CHEM 254</td>
<td>Introductory Chemical Thermodynamics</td>
</tr>
<tr>
<td>CHEM 262</td>
<td>Organic Chemistry for Engineering and Bioinformatics Students</td>
</tr>
<tr>
<td>CHEM 266</td>
<td>Basic Organic Chemistry 1</td>
</tr>
<tr>
<td>CHEM 356</td>
<td>Introductory Quantum Mechanics</td>
</tr>
<tr>
<td>CHEM 404</td>
<td>Physicochemical Aspects of Natural Waters</td>
</tr>
<tr>
<td>EARTH 121</td>
<td>Introductory Earth Sciences</td>
</tr>
<tr>
<td>EARTH 122</td>
<td>Introductory Environmental Sciences</td>
</tr>
<tr>
<td>EARTH 123</td>
<td>Introductory Hydrology</td>
</tr>
<tr>
<td>EARTH 221</td>
<td>Geochemistry 1</td>
</tr>
<tr>
<td>EARTH 270</td>
<td>Disasters and Natural Hazards</td>
</tr>
<tr>
<td>EARTH 281</td>
<td>Geological Impacts on Human Health</td>
</tr>
<tr>
<td>*ECE 209</td>
<td>Electronic and Electrical Properties of Materials</td>
</tr>
<tr>
<td>ENVE 275</td>
<td>Environmental Chemistry</td>
</tr>
<tr>
<td>ENVE 276</td>
<td>Environmental Biology and Biotechnology</td>
</tr>
<tr>
<td>PHYS 234</td>
<td>Quantum Physics 1</td>
</tr>
<tr>
<td>PHYS 263</td>
<td>Classical Mechanics and Special Relativity</td>
</tr>
<tr>
<td>PHYS 275</td>
<td>Planets</td>
</tr>
<tr>
<td>PHYS 280</td>
<td>Introduction to Biophysics</td>
</tr>
<tr>
<td>PHYS 334</td>
<td>Quantum Physics 2</td>
</tr>
<tr>
<td>PHYS 335</td>
<td>Condensed Matter Physics</td>
</tr>
<tr>
<td>PHYS 375</td>
<td>Stars</td>
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</tbody>
</table>
Technical Electives

Students are required to complete five technical elective (TE) courses, normally taken during the 4A and 4B terms. At least three of the TEs must be courses chosen from ECE 406-493 or 499. Up to two TEs may be technical courses from other (non-ECE) programs; such courses must have sufficiently advanced engineering science or engineering design content to be allowed, and must be pre-approved by the ECE Undergraduate Office. Some courses of interest may require prerequisite knowledge that is not part of the core program in Computer Engineering or Electrical Engineering. Students may require extra courses or may need to seek enrolment approval from the course professor if the prerequisite knowledge was acquired by other means. Some combinations of electives may not be taken simultaneously due to timetabling conflicts.

The ECE Department makes every effort to maintain a list of technical electives that reflects the current state of electrical and computer engineering. As such, the list of electives below is subject to change from year to year, and depending on current demand.

The following TE courses are normally offered for the spring (4A) term.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 413</td>
<td>Digital Signal and Image Processing</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 414</td>
<td>Wireless Communications</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 418</td>
<td>Communications Networks</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 432</td>
<td>Radio Frequency Integrated Devices and Circuits</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 445</td>
<td>Integrated Digital Electronics</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 452</td>
<td>Software Design and Architecture</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 454</td>
<td>Distributed Computing</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 455</td>
<td>Embedded Software</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 457A</td>
<td>Cooperative and Adaptive Algorithms</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 458</td>
<td>Computer Security</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 462</td>
<td>Electrical Distribution Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 463</td>
<td>Design and Applications of Power Electronic Converters</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 475</td>
<td>Radio-Wave Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 481</td>
<td>Digital Control Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 486</td>
<td>Robot Dynamics and Control</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>ECE 493</td>
<td>Special Topics in Electrical and Computer Engineering (see note 7)</td>
<td>3</td>
<td>1</td>
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</table>

The following TE courses are normally offered for the winter (4B) term.

<table>
<thead>
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<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 406</td>
<td>Algorithm Design and Analysis</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 409</td>
<td>Cryptography and System Security</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 415</td>
<td>Multimedia Processing and Coding</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 416</td>
<td>Advanced Topics in Networking</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 423</td>
<td>Embedded Computer Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 433</td>
<td>Fabrication Technologies for Micro and Nano Devices</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 444</td>
<td>Integrated Analog Electronics</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 451</td>
<td>Software Requirements Specification and Analysis</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 453</td>
<td>Software Testing, Quality Assurance and Maintenance</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 457B</td>
<td>Fundamentals of Computational Intelligence</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>ECE 459</td>
<td>Programming for Performance</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>
The following project elective is offered every term. Students may take it at most once in the program as a TE course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 499</td>
<td>Engineering Project</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

The following courses are offered for the core program in Electrical Engineering but are considered TE courses for Computer Engineering. Some of these courses have prerequisites that must be met in order to enrol.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 260</td>
<td>Electromechanical Energy Conversion</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 331</td>
<td>Electronic Devices</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 340</td>
<td>Electronic Circuits 2</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 360</td>
<td>Power Systems and Smart Grids</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 373</td>
<td>Radio Frequency and Microwave Circuits</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 375</td>
<td>Electromagnetic Fields and Waves</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

The following courses are offered for the core program in Computer Engineering but are considered TE courses for Electrical Engineering. Some of these courses have prerequisites that must be met in order to enrol.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Cls</th>
<th>Tut</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 224</td>
<td>Embedded Microprocessor Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 252</td>
<td>Systems Programming and Concurrency</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 320</td>
<td>Computer Architecture</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 327</td>
<td>Digital Hardware Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 350</td>
<td>Real-Time Operating Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 351</td>
<td>Compilers</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 356</td>
<td>Database Systems</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>ECE 358</td>
<td>Computer Networks</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

In the 3B term, electrical engineering students must choose one of either ECE 360 or ECE 373. Schedule permitting, the course not chosen may also be taken for credit as a TE. Similarly, in the 3B term, computer engineering students must choose one of either ECE 318 or ECE 358, and two of ECE 320, ECE 350, or ECE 356. Schedule permitting, the courses not chosen may also be taken for credit as TEs.

**Milestones and Deadlines**

**Technical Presentation Milestone**

Normally students are not allowed to enrol in any academic term beyond 3B until the technical presentation milestone is completed. This milestone is met when students successfully deliver a short technical presentation during their 2B term. If unsuccessful, a second attempt is allowed during the 3A term. If still unsuccessful, students must pass a course or workshop that focuses on presentation skills (e.g., a Department approved speech-communications course or an external workshop, such as Toastmasters, with requirements approved by the Department). Students can use the pre-approved course or workshop to clear the technical presentation milestone; alternatively, if the course in question is eligible as a Complementary Studies Elective.
(CSE), students may choose to use the course as a List D CSE, but must then clear the technical presentation milestone by successfully delivering a presentation during their 3B term.

**English Language Proficiency**

Students at the University of Waterloo must demonstrate proficiency in the English language prior to enrolling in the 2B academic term. Further details are described in the [English Language Proficiency Requirement](#) section of the undergraduate calendar.

**Work-term Report Courses**

For each of these "Work-term Report" (WKRPT) courses, the student writes a technical report based on their work-term experience and submits it for grading in the academic term that follows the work term. The reports are normally submitted following the 3rd, 4th, and 5th work terms, as shown in the program table below; however, students have flexibility to move each report by one work term earlier or later in the program. The following table shows the possible submission terms for each report. The normal term of submission is shown in bold. Students are not allowed to enrol in any academic term beyond the last possible submission term without credit for the corresponding work-report course.

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<tbody>
<tr>
<td>WKRPT 201</td>
<td>2nd, 3rd, 4th</td>
<td>2A, 2B, 3A</td>
<td>2B, 3A, 3B</td>
</tr>
<tr>
<td>WKRPT 301</td>
<td>3rd, 4th, 5th</td>
<td>2B, 3A, 3B</td>
<td>3A, 3B, 4A</td>
</tr>
<tr>
<td>WKRPT 401</td>
<td>4th, 5th, 6th</td>
<td>3A, 3B, 4B</td>
<td>3B, 4A, 4B</td>
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**Workplace Hazardous Materials Information System**

Under both the federal and provincial legislation, all students must take Workplace Hazardous Materials Information System (WHMIS) training. Details are described in the [WHMIS Requirements](#) section of the undergraduate calendar. Students must meet this milestone in order to remain enrolled in 1A or to enrol in any academic term beyond 1A.

**Available Options**

The programs in Computer Engineering and Electrical Engineering are designed to offer a well-balanced and rewarding education. Students wishing to further enrich their studies may take any option (or minor or joint degree) for which they meet the eligibility requirements. See the section on Engineering [Interdisciplinary Alternatives](#) for further information. Options typically require extra courses and/or constrain the choice of elective courses. When taking courses from a different program, the student may need to do extra work to compensate for a different background preparation. Time beyond the normal program duration may be necessary due to the extra requirements and constraints on space or scheduling.
Memorandum

To: Mike Grivicic, Assistant University Secretary
CC: Jean-Jacques Van Vlasselaer, Associate Vice-President, International
Svitlana Taraban-Gordon, Senior Instructional Developer, CUT and Internationalization, Centre for Teaching Excellence (CTE)
From: Andreea Ciucurita, Manager, International Mobility & Global Learning
Date: 31-Aug-15
Re: Proposed Changes to the Calendar Description for the Global Experience Certificate (GEC)

Waterloo International is requesting changes to the calendar description of the Global Experience Certificate. To support student learning through international and intercultural experiences, the current structure of the Certificate will be enhanced through the addition of three online learning modules taken at different learning points throughout the GEC. The modules will help to prepare students for their international and cross-cultural learning and critically reflect on their experiences. Students will also be required to submit written assignments to demonstrate their learning and receive feedback from Waterloo International evaluators.

Revised Calendar Description
(Note: strikeout = deleted text; underline = new text)

Overview

Certificate Coordinator: Associate Vice-President International or delegate

Undergraduate students at the University of Waterloo are encouraged to become globally engaged learners and citizens by completing the three (3) components and three (3) online modules of the Global Experience Certificate.

More information is available at Global Experience Certificate, Waterloo International website.

Certificate Requirements

To encourage University of Waterloo students to become globally engaged learners, the University offers undergraduate students the opportunity to obtain a Global Experience Certificate (GEC). A student in any term wishing to complete the certificate is required to complete an online Global Experience Certificate Plan outlining how they will complete the following three GEC components:

1. three for-credit courses (1.5 units) – see first bullet below
2. an international experience (IE)
3. cross-cultural volunteer experience (CCVE)

In addition to the three GEC components, students will be required to complete three online modules.
All three of the following components will be completed during the undergraduate degree program:

In order to obtain the certificate, students must successfully complete the following components during the undergraduate degree program:

- successful completion of the Intercultural Awareness online module, with a written assignment following the module. This module must be completed during the first term in the GEC but before the International Experience (IE) or Cross-Cultural Volunteer Experience (CCVE)
- successful completion of two first-year sequential language courses (other than students' native language) plus one course from the Global Studies Course Requirements list (with the approval of the Associate Vice-President International or designate, courses other than those on the approved list may be used to complete the course component of the certificate.)
- an international experience – exchange, study abroad, co-op work term, internship/externship (outside co-op) or volunteer position outside Canada with a minimum duration of six consecutive weeks. Students will be required to complete the Learning through Experience online module prior to the international experience and submit a written assignment after the international experience.
- a volunteer experience in a cross-cultural context, with a minimum duration of 20 hours, while the applicant is registered at Waterloo as a full-time or part-time student.
- upon completion of the three for-credit courses (1.5 units), International Experience (IE), and Cross-Cultural Volunteer Experience (CCVE), the students will be required to complete the Thinking Back and Looking Forward online module and provide a reflective report on their learning.

All work must be deemed acceptable by Waterloo International evaluators in order for students to pass each component.

Language courses and Global Studies Courses can be completed prior to submission of the GEC application however, the international experience and the cross-cultural volunteer experience cannot have been completed prior to the submission of the GEC application.

Once the GEC application has been completed, it must be submitted to the Associate Vice-President International or designate for approval. Successful completion of the certificate requirements will result in the awarding of a Global Experience Certificate. The Global Experience Certificate will be coordinated by Waterloo International. Students are responsible for notifying Waterloo International of any changes to the plan.

Academic discipline is handled by the Associate Vice-President International or designate in consultation with the Associate Dean for the student’s home faculty. A discipline decision is appealable under Policy 72 - Student Appeals provided that a ground for appeal can be established.

A non-refundable $100 withdrawal fee applies for students who cancel their participation in the Global Experience Certificate or fail to complete the GEC components upon graduation.

For more information on the Global Experience Certificate, please visit Waterloo International uwaterloo.ca/international/.
Institutional Research
  o Early Researcher Awards – 11 funded at $140k each (embargoed until the Provincial government makes the announcement).

Funding Agencies & Non-profit Sponsors
  o SSHRC
    o Partnership Development Grants 2015-16
      o 2 of 4 submitted were successful – 50% success rate - $398,089
    o Insight Grants 2016-17
      o 16 of 43 submitted were successful, for a total of $8,074,845
      o 37.2% success rate; the national average was 31.1%
  o Geoff Fong (Psych), Dave Hammond (SPHHS) and Mary Thompson (Distinguished Professor Emerita – Stats) are the PIs on a large project grant from NIH entitled “Evaluating How Tobacco Control Policies are shaping the Nicotine Delivery Market”. The grant is led by the Medical University of South Carolina, with the uW investigators leading Projects 1, 3 and the Data Management Core, respectively. A total of $6.6M USD over 5 years was awarded to the uWaterloo teams.
  o Scott Leatherdale (SPHHS) has been awarded one of the two CIHR Trailblazer Awards in Population Health Solutions. This comes with a $15,000 grant. (Embargoed until the CIHR announcement in April.)
  o NSERC RTI
    o Waterloo received 21 of 39 submitted totalling $2.62M and a 53.8% success rate

International Research
  o Fereidoun Rezanezhad (Earth & Env Sciences) – Qatar University/QNFR – Approximately $300k CAD
  o Ehab El-Saadany (E&CE) – Qatar University/QNRF - $108k to uW over 3 years

D. George Dixon
Vice-President, University Research
FOR APPROVAL

New Degree Hood

Motion: To approve the following new degree hood:

- Bachelor of Public Health (BPH; effective 2016/17) and Bachelor of Health Promotion (BPH) (effective 2015/16 and prior): Oxford Bachelor shape, with a teal green border and white soutache braid.

Note: The program had a name change approved for 2016. The hood is to be used for both degrees.

Ray Darling
Registrar