UNIVERSITY OF WATERLOO
SENATE GRADUATE & RESEARCH COUNCIL
NOTICE OF MEETING

DATE: Monday 10 April 2023 Chair – J. Casello
TIME: 10:30 a.m. – 12:00 noon
PLACE: NH 3318/3308

AGENDA

Item	Action
Declarations of Conflict of Interest	
a. Excerpt from Bylaw 1, section 8*	Information
CONSENT AGENDA	
Motion: To approve or receive for information by consent, items 1-3 below	
1. Minutes of 6 March 2023*	Decision (SGRC)
2. Graduate Awards*	
a. Waterloo Architecture Award in Community Studies (trust)	Decision (SGRC)
b. KIRKOR Architects + Planners Graduate Scholarship in Entrepreneurship (trust)	Decision (SGRC)
c. Graduate Award for Black and Indigenous Students	Decision (SGRC)
d. Graduate Student Research Dissemination Award	Information
e. Waterloo Institute for Nanotechnology (WIN)-Velocity Scholarship (operating)	Information
3. Curricular Submissions	
a. Arts* (Anna Esselment)	Decision (SGRC)
b. Engineering* (Siva Sivoththaman)	Decision (SGRC)
c. Environment* (Peter Deadman)	Decision (SGRC)
d. Health* (Brian Laird)	Decision (SGRC)
e. Math* (Bertrand Guenin)	Decision (SGRC)
f. Science* (Martin Ross)	Decision (SGRC)
REGULAR AGENDA	
4. Business Arising from the Minutes	Information
5. Co-chairs' Remarks	Information
6. Curricular Submissions	
a. Engineering* (Siva Sivoththaman)	SEN-Regular; 1a,b
b. Math* (Bertrand Guenin)	SEN-Regular; 2a
7. Graduate Studies and Postdoctoral Affairs Visioning Exercise-Continued* (Casello)	Discussion
8. Other Business	Information
9. Next Meeting: 8 May 2023 from 10:30 a.m. - 12 noon; NH3318	Information

*material attached
** to be distributed separately
"SGRC" to be approved on behalf of Senate
"SEN" to be recommended to Senate for approval

Tim Weber-Kraljevski
Governance Officer

3 April 2023

Excerpt from Senate Bylaw 1

8. Declarations of conflict of interest

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

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL
Minutes of the 6 March 2023 Meeting
[in agenda order]
Needles Hall 3318

Present: Ramona Bobocel, Jeff Casello, Charmaine Dean, Rob de Loe, Maureen Drysdale, Bernie Duncker, Anna Esselment, Aiman Fatima, Bertrand Guenin, Alison Hitchens, Ryan Johnson, Julie Joza, Brian Laird, William McIlroy, Ian Milligan, Liz Nilsen, Jennifer Reid, Martin Ross, Manoj Sachdev, Marianne Simm, Julian Surdi, Mike Szarka, Shirley Tang, Kathy Winter (secretary)

Resources: Angela Christelis, Carrie MacKinnon-Molson

Guests: Nasser Abukhdeir, Troy Glover, Mike Grivicic, Kelly Heald, Mark Weber

Regrets: Derek Armitage*, Zerihun Kinate, Anita Layton, Siva Sivoththaman*, Shawn Wettig*

Organization of Meeting: Charmaine Dean, co-chair of the council, took the chair, and Kathy Winter acted as secretary. The secretary advised that due notice of the meeting had been given, a quorum was present, and the meeting was properly constituted.

DECLARATIONS OF CONFLICT OF INTEREST
No conflicts of interest were declared.

CONSENT AGENDA
Council heard a motion to approve or receive for information the items of the consent agenda. Hitchens and Duncker. Carried.

1. MINUTES OF 13 FEBRUARY 2023
Council approved the minutes of the meeting, as distributed.

2. GRADUATE AWARDS
Council approved item a, as presented.

REGULAR AGENDA
3. BUSINESS ARISING FROM THE MINUTES
Under business arising (item 6; 13 February 2023 SGRC), council was apprised that items 6a (class component definitions) and 6b (course delivery modes) would be submitted as a joint SUC / SGRC report to Senate once item 6b has been reconsidered and endorsed by SGRC.

4. CO-CHAIRS' REMARKS
Casello remarked briefly upon the recently concluded funding competitions - 120 applications; 13 accepted—with thanks provided to the adjudication committees. Dean summarized Ministers' recent statement to protect Canada's research and the provincial government's response in support, including commitment to enact new granting models (e.g., no project funding if any affiliations with a university, research institute, or laboratory connected to military, national defence, or state security entities of foreign state actors that pose a risk to Canada's national security) and implementation plans (late spring/summer 2023). In discussion: international visiting graduate students-IVGS (forms being updated in relation to research); cotutelle agreements (GSPA and Director of Research Security available to support and advise); admissions; implications for global open research. Dean also spoke to SGRC strategic discussions (such as Casello's visioning exercise)—noting plans for Duncker to lead discussions related to Create Grants at 8 May 2023 SGRC. Co-chairs Casello and Dean invited council to bring forward other strategic discussion topics.

5. ACADEMIC PROGRAM REVIEWS

On behalf of Senate, council heard a motion to approve the following, as presented:

a. Final Assessment Report: Business, Entrepreneurship and Technology. In discussion: collab and startup support through post-degree and new outreach efforts; strong and growing alumni relationships; scaling through faculty partnerships and growth. Sachdev and Ross. Carried.
b. Final Assessment Report: Recreation and Leisure Studies. In discussion: enrollment values for course- and research-based programs; students' evaluations of co-op opportunities and engagement with CEE thereon; growing research opportunities. Laird and McIlroy. Carried.
c. Two-year Progress Report: Chemical Engineering. In discussion: recommendation to implement more frequent graduate student advisory committee meetings through advanced planning and scheduling. Sachdev and Bobocel. Carried.

6. GRADUATE STUDIES ACADEMIC CALENDAR (GSAC) REVISIONS

Council heard a motion to recommend to Senate the following academic calendar changes, as presented:

a. Revisions to "Grading scheme" text in the "Grades and grading" section. Simm and Guenin. Carried.
b. Revisions to the inactive status definition to include information about medical leave and the inactive status process for the Mathematics for Teachers (MMT) program. Simm and Esselment. Carried.

7. GRADUATE STUDIES AND POSTDOCTORAL AFFAIRS VISIONING

Casello continued his presentation, *Towards a proposed vision: Graduate studies at Waterloo*, as circulated. Some central questions included: How do we know our students are impactful? What metrics and data collection methods demonstrate impact? In Discussion: current strategies and metrics that speak to impact (e.g., annual performance review-APR, student activity reports); enhancing current methods and seeking new methods (longitudinal perspective, calibrated data, automated APRs, introduce portal solution); challenges in relation to harvesting these data. Visioning discussion will conclude on 10 April 2023 SGRC with recommendations and actionable items to follow, as well as to receive Council's endorsement thereon.

8. OTHER BUSINESS

There was no other business.

9. NEXT MEETING

The next meeting will be held Monday 10 April 2023 from 10:30 a.m. to 12 noon in NH3318.

29 March 2023

Kathy Winter, PhD, CPsych,
Assistant University Secretary

UNIVERSITY OF WATERLOO | Graduate Studies and Postdoctoral Affairs

March 29, 2023

TO: Mike Grivicic, Associate University, Senate Graduate and Research Council

FROM: Heidi Mussar, Associate Director, Graduate Financial Aid & Awards

RE: Agenda items for Senate Graduate & Research Council – April 2023

Items for Approval

a) Waterloo Architecture Student Award in Community Studies – trust

An award valued at $1,000 will be awarded annually to a full time undergraduate or graduate student enrolled in any year in the School of Architecture. Selection is based on research or a project that profiles, researches, explores, and/or works to develop solutions for a not-for-profit organization and/or charity located in the City of Cambridge. In the application, students should clearly identify at least one local not-for-profit or charitable organization that either directly or indirectly ties into their research. Interested students must submit an application that can be found on the School of Architecture website, by the deadline advertised. This fund is made possible by donations from corporate partners, alumni and friends located in, or with strong connections to, the City of Cambridge.

b) KIRKOR Architects + Planners Graduate Scholarship in Entrepreneurship – trust

One scholarship, valued at $5,000, will be awarded annually to a full-time graduate student enrolled in any year of the master's program in the School of Architecture in the Faculty of Engineering. Selection is based on research or a project demonstrating merit in entrepreneurship within the field of architecture. The recipient will be a current or aspiring start-up founder, and/or have an idea that solves a problem not yet demonstrated in the market. Research projects should have clear entrepreneurial applicability. Students interested in applying must submit an application that can be found on the School of Architecture website, by the deadline advertised. This fund is made possible by a donation from KIRKOR Architects + Planners.

The period of this defined term award will be from 2023 to 2027.

c) Graduate Award for Black and Indigenous Students

Scholarships, each valued at $5,000, will be awarded to Black or Indigenous students registered full time in their first year of a doctoral program at the University of Waterloo. Selection will be based on academic achievement (minimum cumulative average of 75% or equivalent in the current or most recently completed program) as well as their written statement where they describe any academic or non-academic extracurricular, volunteer, leadership, or entrepreneurial-related experiences they have been involved in within the last 3 years.

Interested applicants must submit an application form that can be found on the Graduate Student Association's website by June 15. Selection will be made by a committee, chaired by the Graduate Student Association (GSA), that includes diverse representation, normally in July.

The goal is to provide a total of six awards each valued at $5,000 in 2023-2024, one to each Faculty.

A total of $30k is available to support this initiative. Funding for these scholarships is made possible through contributions from the Graduate Student Association (GSA), the Graduate Studies Endowment Fund (GSEF), and Graduate Studies and Postdoctoral Affairs (GSPA).

Items for Information

d) Graduate Student Research Dissemination Award

Through a commitment of financial support from the Graduate Studies Endowment Fund (GSEF) and Graduate Studies and Postdoctoral Affairs (GSPA), funding has been available for many years through the *Graduate Studies Conference Assistantship* to support full or part-time graduate students who present their research at an academic conference. In recent years, a maximum of $500 was provided to students as a reimbursement upon receipt of a claim form and attached receipts.

This award and process is being replaced with the *Graduate Student Research Dissemination Award* effective May 1, 2023. Funding will still be provided via GSEF and GSPA but will be provided at the time of approval of the application and be applied to the student's Quest account rather than paid as a reimbursement.

As part of the application, students must provide summaries of the research they will be presenting as well as a description of the expected outcomes and how the conference will benefit their research/academic studies. Additionally, supervisors will be required to sign a verification form as part of the application, confirming that the conference is of direct benefit to the student's research and that the student will be presenting their own research. Award recipients who do not end up attending the conference are required to notify GSPA immediately to arrange for repayment of any funds awarded. GSPA will perform audits of select award recipients who will be required to provide proof of presentation.

The summaries of the research being presented will be used on the GSPA website to promote graduate student research at Waterloo.

Value: maximum of $250 will be provided for virtual conferences and $500 for in-person conferences. The number of awards available will vary from year to year depending on available budget. The annual budget will be split across three terms, normally with more budget allocated to the spring term. Applications will be approved on a first-come first-serve basis each term, depending on available budget. (note: values may be revisited/modified in future)

e) Waterloo Institute for Nanotechnology (WIN)-Velocity Scholarship – operating

Originally established in December 2021 as the following:

The WIN-Velocity Scholarship, with a value equivalent to a Graduate Research Studentship (GRS) for two years, has been made possible through a financial contribution from the Waterloo Institute for Nanotechnology (WIN) to support domestic research-based master's students, who will be registered full time in their first year of graduate studies, in the Faculty of Engineering and/or Faculty of Science. Eligible students must pursue commercialization and entrepreneurship activities for establishing a start-up company at UW with Velocity support, based on a business idea in "deep-tech" which matches research conducted by the WIN supervisor. Students participating in the program will receive mentorship and advice for start-up and entrepreneurial activities from Velocity. To be considered for this scholarship, students must complete the WIN-Velocity Scholarship application found on the WIN-Velocity website and submit it according to the graduate admission deadlines set by the Faculties of Engineering and Science: 1st February for Fall admission; 1st June for Winter admission; and

1st October for Spring admission. A committee composed of WIN and Velocity representatives will review applications and make selections based both on academic credentials as well as on the market potential of the applicant's business idea within six (6) to eight (8) weeks of application submission.

As of March 2023, the award is being amended as follows:

- Clarifying that students must be admitted into the *first year* of a research-based master's program in order to be considered.
- Permit recipients who fast-track from a master's program into a doctoral program to continue to receive the remainder of their scholarship for the duration it was issued (the scholarship value will continue to be at the master's level).
- Clarifying that in the case of a recipient who fast-tracks into a doctoral program, the supervisor must provide the student's minimum funding, with this scholarship being supplementary to that minimum.

ARTS GRADUATE STUDIES

March 28, 2023

TO: Members, Senate Graduate and Research Council

FROM: Maha Eid, Graduate Studies and Research Officer

RE: Graduate Affairs Group Reports

The attached Arts Graduate Affairs Group reports were approved by the Arts Faculty Council meeting on November 15, 2022 and March 28, 2023 and are now being submitted for approval by the Senate Graduate and Research Council on April 10, 2023.

Maha Eid

Maha Eid

Attach.

Associate Dean of Arts, Graduate Studies: Anna Esselment, PAS 2433, ext. 32190 E-mail: alesselment@uwaterloo.ca
Graduate Studies & Research Officer: Maha Eid, PAS 2428, ext. 42415 Email: maha.eid@uwaterloo.ca

Arts Faculty Council Report to

Senate Graduate and Research Council

CURRICULAR ITEMS for approval [bottom right pagination]

A) **Political Science**
   a. Inactivate the following courses:
      i. PSCI 654 (cross listed GGOV 632, PACS 632) [3-4]
      ii. PSCI 659 (cross listed PACS 662) [5-6]

B) **Global Governance**
   a. Inactivate the following courses:
      i. GGOV 632 (cross listed PSCI 654, PACS 632) [7-8]

C) **Peace and Conflict Studies –**
   a. Inactivate the following courses:
      i. PACS 632 (cross listed with PSCI 654 and GGOV 632) [9-10]
      ii. PACS 662 (cross listed with PSCI 659) [11-12]
   b. MPACS program change: update existing course title for PACS 650 and inactivating courses PACS 632 and PACS 662. [13-19]

D) **English Language and Literature**
   a. Cross listing SYDE 663 with ENGL 701 [20-21]

E) **Psychology**
   a. MA in Psychology – Aeronautics – changing the GREs from "required" to an "optional" [22-23]
   b. MA in Psychology - Changing the GREs from a "required" to an "optional" admission requirement for the Cognitive Neuroscience and Cognitive Psychology areas/graduate research fields. [24-25]
   c. PhD in Psychology - Specifying that the GRE admission requirement is only required for candidates applying to the Industrial/Organizational Psychology areas/graduate research field, but optional for Cognitive Neuroscience, Cognitive Psychology and Developmental Psychology. [26-27]

F) **Peace and Conflict Studies –**
   a. Create and cross list the following courses:
      i. PACS 638 (Social Inequality) cross listed with current SOC 720 [28-29]
      ii. PACS 640 (Political Sociology) cross listed with current SOC 765 [30-31]
      iii. PACS 642 (Feminism, Law and Governance) cross listed with current SOC 782 [32-33]
   b. MA Peace and Conflict Studies (MPACS): The new PACS electives (PACS 638, 640 & 642) will be cross-listed with the existing SOC courses listed above. [34-40]

G) **Sociology**
   a. Cross list the following courses:
      i. SOC 720 (Social Inequality) cross listed with PACS 638 [41-42]
      ii. SOC 765 (Political Sociology) cross listed with PACS 640 [43-44]
      iii. SOC 782 (Feminism, Law and Governance) cross listed with PACS 642 [45-46]
   b. Deactivate the following courses:
      i. SOC 759 (Sociology of Work and Occupations) [47-48]
      ii. SOC 760 (Social Networks) [49-50]
      iii. SOC 776 (Sociology of Knowledge) [51-52]

c. Create the following course:
    i. SOC 723 (Technology and Gender) [53-54]

H) **Political Science**

a. Create the following courses:
    i. PSCI 609 (Public International Law) cross listed with current GGOV 660/SUSM 660 [55-56]
    ii. PSCI 649 (How Political Institutions Change Society) [57-58]
b. Revise the following courses:
    i. PSCI 610 (International Relations Theory) cross listing with GGOV 654 [59-60]
    ii. PSCI 611 (Current Issues in International Relations) cross listing with GGOV 655 [61-62]

I) **Global Governance**

a. Create the following courses:
    i. GGOV 654 (International Relations Theory) cross listed with current PSCI 610 [63-64]
    ii. GGOV 655 (Current Issues in International Relations) cross listed with current PSCI 611 [65-66]
b. Revise the following courses:
    i. GGOV 660 (Public International Law) cross listing with PSCI609. Already cross listed with SUSM 660. [67-68]
    ii. MA in GGOV (adding GGOV 654, GGOV 655 to the program page) [69-73]

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PSCI

Course number: 654

Course ID: 002444

Course title (max. 100 characters including spaces): Post-War Reconstruction and State Building

Course short title (max. 30 characters including spaces): Post-War Reconstruction

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Rebuilding states in the aftermath of conflict and state failure represents one of the foremost challenges facing the international community. The post-Cold War era has shown that weak states represent as great a threat to international security and stability as strong ones. The transition from war to peace and state failure to stability in these states can be conceptualized as encompassing three separate but interrelated transitions, in the economic, political and security spheres. The course will deconstruct and analyze this triple transition, examine both its theoretical roots and practical application with reference to a number of recent case studies.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *GGOV 632, PACS 632; inactive request for GGOV 632 and PACS 632 also submitted*

Sections combined/held with:

Rationale for request:

Course has not been offered in five years due to faculty retiring, and so to provide students with accurate transparent information, we would like to remove it from the course offerings.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 09/23/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/12/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PSCI

Course number: 659

Course ID: 002449

Course title (max. 100 characters including spaces): Conflict and Conflict Resolution

Course short title (max. 30 characters including spaces): Conflict & Conflict Resolution

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: A graduate level survey of theories of conflict resolution drawn from the international relations, comparative politics, and peace studies. Why do we have violent political conflict, and how can it be resolved? How and why do wars begin and end? This course focuses on political violence and conflict resolution between groups, including but not limited to states.
Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PACS 662, inactive request for PACS 662 also submitted*

Sections combined/held with:

Rationale for request:

Course has not been offered in five years due to faculty retiring, and so to provide students with accurate transparent information, we would like to remove it from the course offerings.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 09/23/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/12/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: GGOV

Course number: 632

Course ID: 002444

Course title (max. 100 characters including spaces): Post-War Reconstruction and State Building

Course short title (max. 30 characters including spaces): Post-War Reconstruction

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Rebuilding states in the aftermath of conflict and state failure represents one of the foremost challenges facing the international community. The post-Cold War era has shown that weak states represent as great a threat to international security and stability as strong ones. The transition from war to peace and state failure to stability in these states can be conceptualized as encompassing three separate but interrelated transitions, in the economic, political and security spheres. The course will deconstruct and analyze this triple transition, examine both its theoretical roots and practical application with reference to a number of recent case studies.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PSCI 654, PACS 632; inactive request for PSCI 654 and PACS 632 also submitted*

Sections combined/held with:

Rationale for request:

Course has not been offered in five years due to faculty retiring, and so to provide students with accurate transparent information, we would like to remove it from the course offerings.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 09/23/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/13/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

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Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PACS

Course number: 632

Course ID: 002444

Course title (max. 100 characters including spaces): Post-War Reconstruction and State Building

Course short title (max. 30 characters including spaces): Post-War Reconstruction

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Rebuilding states in the aftermath of conflict and state failure represents one of the foremost challenges facing the international community. The post-Cold War era has shown that weak states represent as great a threat to international security and stability as strong ones. The transition from war to peace and state failure to stability in these states can be conceptualized as encompassing three separate but interrelated transitions, in the economic, political and security spheres. The course will deconstruct and analyze this triple transition, examine both its theoretical roots and practical application with reference to a number of recent case studies.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PSCI 654, GGOV 632; inactive request for PSCI 654 and GGOV 632 also submitted*

Sections combined/held with:

Rationale for request:

Course has not been offered in five years due to faculty retiring, and so to provide students with accurate transparent information, we would like to remove it from the course offerings.

Form completed by: Reina Neufeldt
Department/School approval date (mm/dd/yy): 09/23/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/18/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

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Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PACS

Course number: 662

Course ID: 002449

Course title (max. 100 characters including spaces): Conflict and Conflict Resolution

Course short title (max. 30 characters including spaces): Conflict & Conflict Resolution

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: A graduate level survey of theories of conflict resolution drawn from the international relations, comparative politics, and peace studies. Why do we have violent political conflict, and how can it be resolved? How and why do wars begin and end? This course focuses on political violence and conflict resolution between groups, including but not limited to states.
Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PSCI 659, inactive request for PSCI 659 also submitted*

Sections combined/held with:

Rationale for request:

Course has not been offered in five years due to faculty retiring, and so to provide students with accurate transparent information, we would like to remove it from the course offerings.

Form completed by: Reina Neufeldt
Department/School approval date (mm/dd/yy): 09/23/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/17/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies Program Revision Template

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

Faculty: Arts

Program: Master of Peace and Conflict Studies (MPACS)

Program contact name(s): Reina Neufeldt, Thomas Fraser

Form completed by: Thomas Fraser

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Updating an existing course title (PACS 650) and removing inactivated courses (PACS 632, PACS 662) from the list of required/elective courses.

Is this a major modification to the program? No

Rationale for change(s):

The PACS 650 course title is being updated in the GSAC program page to match the title that appears in the course catalog. PACS 632 and PACS 662 are being removed from the list of required/elective courses since they have been inactivated.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-peace-and-conflict-studies/master-peace-and-conflict-studies-mpacs

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

Degree requirements
 	
• **Courses**
  ○ The program requires successful completion of 10 courses (5.00 units total).
	Degree requirements
	
	• **Courses**
	  ○ The program requires successful completion of 10 courses (5.00 units total).

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
○ Full-time students will normally be expected to complete the degree requirements over a consecutive four-term period, enrolling in three courses for the first two terms and at least two courses in the last two terms. ○ Part-time students are expected to complete at least two courses per academic year and must complete the program within five years. ○ Students must complete the following courses: ▪ 2.50 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 623 Directed Reading in Peace and Conflict Studies ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training ▪ An additional 1.50 units that can be chosen from: ▪ Additional courses from PACS 610 - PACS 626 ▪ PACS 630/GGOV 610/PSCI 688	○ Full-time students will normally be expected to complete the degree requirements over a consecutive four-term period, enrolling in three courses for the first two terms and at least two courses in the last two terms. ○ Part-time students are expected to complete at least two courses per academic year and must complete the program within five years. ○ Students must complete the following courses: ▪ 2.50 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 623 Directed Reading in Peace and Conflict Studies ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training ▪ An additional 1.50 units that can be chosen from: ▪ Additional courses from PACS 610 - PACS 626 ▪ PACS 630/GGOV 610/PSCI 688

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Governance of Global Economy ▪ ~~PACS 632/GGOV 632/PSCI 654 Post-War Reconstruction and State Building~~ ▪ PACS 633/GGOV 640/PSCI 658 Human Rights in the Globalized World ▪ PACS 634/GGOV 630/PSCI 678 Security Ontology-Theory ▪ PACS 635/GGOV 631/PSCI 679 Security Governance: Actors, Institutions, and Issues ▪ PACS 650/INDEV 604 Sustainable Cities ▪ PACS 651/INDEV 605 Economics for Sustainable Development ▪ PACS 652/INDEV 608 Water and Security ▪ PACS 660/PSCI 624 Justice and Gender ▪ PACS 661/PSCI 655 Ethnic Conflict and Conflict Resolution I ▪ ~~PACS 662/PSCI 659 Conflict and Conflict Resolution~~ ▪ PACS 670/TS 637 War and Peace in Christian Theology ▪ PACS 671/TS 619 The Bible, Peace, and Violence ▪ PACS 672/TS 731 Christianity's Encounter with Other Faiths o Students may request permission from the PACS Graduate Advisor to enrol in elective courses in other University of Waterloo or Wilfrid Laurier University graduate courses that will complement their program of study. Permission must also be granted by the department or program in which the courses are offered.	Governance of Global Economy ▪ PACS 633/GGOV 640/PSCI 658 Human Rights in the Globalized World ▪ PACS 634/GGOV 630/PSCI 678 Security Ontology-Theory ▪ PACS 635/GGOV 631/PSCI 679 Security Governance: Actors, Institutions, and Issues ▪ PACS 650/INDEV 604 Sustainable Cities ▪ PACS 651/INDEV 605 Economics for Sustainable Development ▪ PACS 652/INDEV 608 Water and Security ▪ PACS 660/PSCI 624 Justice and Gender ▪ PACS 661/PSCI 655 Ethnic Conflict and Conflict Resolution I ▪ PACS 670/TS 637 War and Peace in Christian Theology ▪ PACS 671/TS 619 The Bible, Peace, and Violence ▪ PACS 672/TS 731 Christianity's Encounter with Other Faiths o Students may request permission from the PACS Graduate Advisor to enrol in elective courses in other University of Waterloo or Wilfrid Laurier University graduate courses that will complement their program of study. Permission must also be granted by the department or program in which the courses are offered. o The program offers 3 non-traditional courses which will be managed as follows: ▪ PACS 621 Peace Research: an agreement between the student and the supervising faculty member about research expectations, length of paper, format, topic, types of sources

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
○ The program offers 3 non-traditional courses which will be managed as follows: ▪ PACS 621 Peace Research: an agreement between the student and the supervising faculty member about research expectations, length of paper, format, topic, types of sources that can be used, and anticipated outcomes is required. Students will be required to prepare a detailed proposal prior to registration in this course that will fully explain the proposed research as well as provide a short bibliography to ensure that adequate sources exist to successfully complete the research. Students will meet periodically with their instructor throughout the term to ensure that milestones are reached. Written work will be evaluated per normal academic criteria. ▪ PACS 625 Internship: students will be required to submit a petition outlining the details of the proposed internship such as place, position, cost, academic work expectations, security concerns, etc. Students will be expected to engage in substantial research on issues related to the host agency as part of the internship. While PACS has the agreement of over ten organizations who are interested in hosting interns, it is anticipated that internships will be negotiated to fit the unique long-term goals of each student. Host agencies will be expected to submit a reference evaluating the student intern at the end of the internship. Written work submitted by the student (evidence of research and reflective report) will be evaluated per normal academic criteria. ▪ PACS 626 Conflict Resolution Skills Training: this course	that can be used, and anticipated outcomes is required. Students will be required to prepare a detailed proposal prior to registration in this course that will fully explain the proposed research as well as provide a short bibliography to ensure that adequate sources exist to successfully complete the research. Students will meet periodically with their instructor throughout the term to ensure that milestones are reached. Written work will be evaluated per normal academic criteria. ▪ PACS 625 Internship: students will be required to submit a petition outlining the details of the proposed internship such as place, position, cost, academic work expectations, security concerns, etc. Students will be expected to engage in substantial research on issues related to the host agency as part of the internship. While PACS has the agreement of over ten organizations who are interested in hosting interns, it is anticipated that internships will be negotiated to fit the unique long-term goals of each student. Host agencies will be expected to submit a reference evaluating the student intern at the end of the internship. Written work submitted by the student (evidence of research and reflective report) will be evaluated per normal academic criteria. ▪ PACS 626 Conflict Resolution Skills Training: this course offers an opportunity for students to take skills-training workshops. Program consent is required to ensure that workshops selected by students, plus the expected additional assigned academic work, are appropriate.

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
offers an opportunity for students to take skills-training workshops. Program consent is required to ensure that workshops selected by students, plus the expected additional assigned academic work, are appropriate. ○ Students in the MPACS program may also choose to pursue the Graduate Specialization in Peace Integration. ○ A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MPACS degree and the requirements associated with the Graduate Specialization. ○ The course requirements for the Graduate Specialization in Peace Integration are described below. ○ Students must complete the following courses: ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ 1.50 units from the following list (note: each 0.50 unit/course must be from a different subject code/area): ▪ GGOV 610/PSCI 688/PACS 630 Governance of Global Economy ▪ GGOV 622 Complexity and Global Governance ▪ GGOV 630/PSCI 678/PACS 634 Security Ontology-Theory ▪ GGOV 631/PSCI 679/PACS 635 Security Governance: Actors, Institutions, and Issues ▪ GGOV 633 Managing Nuclear Risk	○ Students in the MPACS program may also choose to pursue the Graduate Specialization in Peace Integration. ○ A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MPACS degree and the requirements associated with the Graduate Specialization. ○ The course requirements for the Graduate Specialization in Peace Integration are described below. ○ Students must complete the following courses: ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ 1.50 units from the following list (note: each 0.50 unit/course must be from a different subject code/area): ▪ GGOV 610/PSCI 688/PACS 630 Governance of Global Economy ▪ GGOV 622 Complexity and Global Governance ▪ GGOV 630/PSCI 678/PACS 634 Security Ontology-Theory ▪ GGOV 631/PSCI 679/PACS 635 Security Governance: Actors, Institutions, and Issues ▪ GGOV 633 Managing Nuclear Risk ▪ GGOV 662/SOC 781 Global Development Governance ▪ INDEV 604/PACS 650 Sustainable Cities ▪ INDEV 605/PACS 651 Economics for Sustainable Development

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
▪ GGOV 662/SOC 781 Global Development Governance ▪ INDEV 604/PACS 650 Sustainable ~~Food Systems~~ ▪ INDEV 605/PACS 651 Economics for Sustainable Development ▪ INDEV 608/PACS 652 Water and Security ▪ INDEV 609 Sustainability Concepts, Applications and Key Debates ▪ INDEV 613 Water, Human Security and Development ▪ GEMCC 602 Climate Change: Vulnerability and Adaptation ▪ GEMCC 622 Climate Change, Natural Hazards and Disaster Risk Reduction ▪ GEMCC 640 Climate Change Governance: From Global Treaties to Local Innovation ▪ HLTH 603 Health Systems and Policy ▪ HLTH 604 Health and the Environment (blended on-campus/online offering) ▪ HLTH 607 Social and Cultural Aspects of Public Health (blended on-campus/online offering) ▪ HLTH 614 Foundations of Program Evaluation ▪ HLTH 632 Health Economics and Public Health (online offering) ▪ HLTH 661 Geographic Information Systems and Public Health (online offering) ▪ HLTH 662 Global Health ▪ 2.00 units of:	▪ INDEV 608/PACS 652 Water and Security ▪ INDEV 609 Sustainability Concepts, Applications and Key Debates ▪ INDEV 613 Water, Human Security and Development ▪ GEMCC 602 Climate Change: Vulnerability and Adaptation ▪ GEMCC 622 Climate Change, Natural Hazards and Disaster Risk Reduction ▪ GEMCC 640 Climate Change Governance: From Global Treaties to Local Innovation ▪ HLTH 603 Health Systems and Policy ▪ HLTH 604 Health and the Environment (blended on-campus/online offering) ▪ HLTH 607 Social and Cultural Aspects of Public Health (blended on-campus/online offering) ▪ HLTH 614 Foundations of Program Evaluation ▪ HLTH 632 Health Economics and Public Health (online offering) ▪ HLTH 661 Geographic Information Systems and Public Health (online offering) ▪ HLTH 662 Global Health ▪ 2.00 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ At least 1.00 units of:

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training	▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training

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

Currently registered students will not be impacted by these changes. The updated list of courses will provide students with more accurate transparent course information.

Department/School approval date (mm/dd/yy): 09/23/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/18/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Program Revision Template

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

Faculty: Arts

Program: Master of Arts (MA) in Psychology - Aeronautics

Program contact name(s): Jonathan Fugelsang

Form completed by: Jonathan Fugelsang

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Changing the GRE's from a "required" to an "optional" admission requirement.

Is this a major modification to the program? No

Rationale for change(s):

The rationale for making the GRE optional rather than required is based on: (1) an evaluation of the graduate admissions procedures at our peer (and competitor) programs, and (2) faculty perceptions of the utility of the GREs for predicting graduate school success within each research field.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-psychology/master-arts-ma-psychology-aeronautics

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

Admission requirements
 	
• **Minimum requirements**
  ○ Normally an Honours Bachelor's degree or its equivalent in Psychology with at least a 80% overall standing, in the last two years, or equivalent.
  ○ Completion of the Department of Psychology Application.
	Admission requirements
	
	• **Minimum requirements**
	  ○ Normally an Honours Bachelor's degree or its equivalent in Psychology with at least a 80% overall standing, in the last two years, or equivalent.
	  ○ Completion of the Department of Psychology Application.
	  ○ Candidates may submit results from the Graduate Record Examination (Verbal,

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
○ Submit results from the Graduate Record Examination (Verbal, Quantitative, and Analytic scores). ○ Candidates with an Honours Bachelor's degree or equivalent preparation may be admitted to a Master's program or directly to a Doctor of Philosophy (PhD) program. • **Application materials** ○ ~~Graduate Record Examination (GRE)~~ ○ Personal statement ○ Supplementary information form ○ Transcript(s) ▪ From all other post-secondary institutions.	Quantitative, and Analytic scores), though this is not a requirement. ○ Candidates with an Honours Bachelor's degree or equivalent preparation may be admitted to a Master's program or directly to a Doctor of Philosophy (PhD) program. • **Application materials** ○ Personal statement ○ Supplementary information form ○ Transcript(s) ▪ From all other post-secondary institutions.

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

Currently registered students will not be impacted by these changes.

Department/School approval date (mm/dd/yy): 01/11/2023
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/12/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

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

Faculty: Arts

Program: Master of Arts (MA) in Psychology

Program contact name(s): Jonathan Fugelsang

Form completed by: Jonathan Fugelsang

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Changing the GRE's from a "required" to an "optional" admission requirement for the Cognitive Neuroscience and Cognitive Psychology areas/graduate research fields.

Is this a major modification to the program? No

Rationale for change(s):

Our Department has four research fields that offer MA degrees (Clinical Psychology, Cognitive Neuroscience, Cognitive Psychology, Social Psychology) that each independently review applications for graduate school and make offers to students to join their respective areas. Currently, two of the four areas/research fields (Cognitive Neuroscience, Cognitive Psychology) require GREs as part of the MA application package. However, those two areas no longer wish to require the GREs for the MA application package. Rather, they wish to make them optional. The rationale for making them optional rather than required is based on: (1) an evaluation of the graduate admissions procedures at our peer (and competitor) programs, and (2) faculty perceptions of the utility of the GREs for predicting graduate school success within each research field.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-psychology/master-arts-ma-psychology

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

Admission requirements
 	
• **Minimum requirements**
  ○ Normally an Honours Bachelor's degree or its equivalent in Psychology with at least a 80% overall standing, in the last two years, or equivalent.
  ○ Completion of the Department of Psychology Application.
	Admission requirements
	
	• **Minimum requirements**
	  ○ Normally an Honours Bachelor's degree or its equivalent in Psychology with at least a 80% overall standing, in the last two years, or equivalent.
	  ○ Completion of the Department of Psychology Application.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
○ Candidates applying to the Cognitive Neuroscience and Cognitive Psychology graduate research fields within the program ~~must~~ submit results from the Graduate Record Examination (Verbal, Quantitative, and Analytic scores). ○ Candidates with an Honours Bachelor's degree or equivalent preparation may be admitted to a Master's program or directly to a Doctor of Philosophy (PhD) program. ○ Qualified candidates are admitted to either a MA or a PhD program (in which a Master's degree may be obtained along the way). The program to which candidates are admitted to varies by program Area (e.g., Clinical and Social applicants are typically accepted into an MA program, while Cognition, Cognitive Neuroscience, Developmental, and Industrial Organizational students are typically accepted to a PhD program). Candidates accepted to the MA program are expected to continue to a PhD program. • **Application materials** ○ ~~Graduate Record Examination (GRE)~~ ▪ ~~Required for candidates applying to the Cognitive Neuroscience and Cognitive Psychology graduate research fields within the program.~~ ○ Personal statement ○ Supplementary information form ○ Transcript(s) ▪ From all other post-secondary institutions.	○ Candidates applying to the Cognitive Neuroscience and Cognitive Psychology graduate research fields within the program <u>may</u> submit results from the Graduate Record Examination (Verbal, Quantitative, and Analytic scores), <u>though this is not a requirement.</u> ○ Candidates with an Honours Bachelor's degree or equivalent preparation may be admitted to a Master's program or directly to a Doctor of Philosophy (PhD) program. ○ Qualified candidates are admitted to either a MA or a PhD program (in which a Master's degree may be obtained along the way). The program to which candidates are admitted to varies by program Area (e.g., Clinical and Social applicants are typically accepted into an MA program, while Cognition, Cognitive Neuroscience, Developmental, and Industrial Organizational students are typically accepted to a PhD program). Candidates accepted to the MA program are expected to continue to a PhD program. • **Application materials** ○ Personal statement ○ Supplementary information form ○ Transcript(s) ▪ From all other post-secondary institutions.

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

Currently registered students will not be impacted by these changes.

Department/School approval date (mm/dd/yy): 01/11/2023

Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/12/23

Faculty approval date (mm/dd/yy):

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

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

Graduate Studies
Program Revision Template

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

Faculty: Arts

Program: Doctor of Philosophy (PhD) in Psychology

Program contact name(s): Jonathan Fugelsang

Form completed by: Jonathan Fugelsang

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Specifying that the GRE admission requirement is only required for candidates applying to the Industrial/Organizational Psychology areas/graduate research field, but optional for Cognitive Neuroscience, Cognitive Psychology and Developmental Psychology.

Is this a major modification to the program? No

Rationale for change(s):

Our Department has six research fields that offer PhD degrees (Clinical Psychology, Cognitive Neuroscience, Cognitive Psychology, Developmental Psychology, Industrial/Organizational Psychology, and Social Psychology) that each independently review applications for graduate school and make offers to students to join their respective areas. Currently, three of the six areas/research fields (Cognitive Neuroscience, Cognitive Psychology, and Industrial/Organization Psychology) require GREs as part of the PhD application package. However, two of these research fields (Cognitive Neuroscience and Cognitive Psychology) no longer wish to require the GREs for the PhD application package. However, these areas wish to give applicants the option to include them if they wish. Developmental Psychology would also like to give applicants the option to include them. Industrial/Organization Psychology, however, wishes to retain them as required. The rationale for being required versus optional in each research field is based on: (1) an evaluation of the graduate admissions procedures at our peer (and competitor) programs, and (2) faculty perceptions of the utility of the GREs for predicting graduate school success within each research field.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-psychology/doctor-philosophy-phd-psychology

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

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

Admission requirements
 	
• **Minimum requirements**
  ○ A 80% overall standing, or equivalent, in the last two years of study in the previous degree is the minimum requirement for admission.
  ○ Candidates applying to the ~~Cognitive Neuroscience, Cognitive Psychology, and~~ Industrial/Organizational Psychology graduate research field~~s~~ within the program must submit results from the Graduate Record Examination (Verbal, Quantitative, and Analytic scores).
  ○ Please note that in most areas a Master's degree is not required for admission into the PhD program (the exception is Social Psychology and Clinical Psychology).
 	
• **Application materials**
  ○ Graduate Record Examination (GRE)
  ▪ Required for candidates applying to the ~~Cognitive Neuroscience, Cognitive Psychology, and~~ Industrial/Organizational Psychology graduate research field~~s~~ within the program.
  ○ Personal statement
  ○ Supplementary information form
  ○ Transcript(s)
	Admission requirements
	
	• **Minimum requirements**
	  ○ A 80% overall standing, or equivalent, in the last two years of study in the previous degree is the minimum requirement for admission.
	  ○ Candidates applying to the Industrial/Organizational Psychology graduate research field within the program must submit results from the Graduate Record Examination (Verbal, Quantitative, and Analytic scores). <u>These scores are optional for students applying to the Cognitive Neuroscience, Cognitive Psychology, and Developmental Psychology graduate research fields.</u>
	  ○ Please note that in most areas a Master's degree is not required for admission into the PhD program (the exception is Social Psychology and Clinical Psychology).
	
	• **Application materials**
	  ○ Graduate Record Examination (GRE)
	  ▪ Required for candidates applying to the Industrial/Organizational Psychology graduate research field within the program <u>and optional for candidates applying to the Cognitive Neuroscience, Cognitive Psychology, and Developmental Psychology graduate research fields.</u>
	  ○ Personal statement
	  ○ Supplementary information form
	  ○ Transcript(s)

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

Currently registered students will not be impacted by these changes.

Department/School approval date (mm/dd/yy): 01/11/2023

Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/12/23

Faculty approval date (mm/dd/yy):

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

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

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Creating PACS 638 to cross-list with SOC 720.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PACS

Course number: 638

Course ID: 003050

Course title (max. 100 characters including spaces): Social Inequality

Course short title (max. 30 characters including spaces): Social Inequality

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course examines the dimensions, causes, and consequences of social inequality. Focus will vary by instructor specialization.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *SOC 720 (cross-list request for SOC 720 also submitted)*

Sections combined/held with:

Rationale for request:

This course has been identified as a relevant cross-listing for MPACS students. Formally cross-listing this course expands options for MPACS student course electives and removes the administrative step of applying for approval. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS 638 elective will be cross-listed with the existing SOC 720 course.

Form completed by: Thomas Fraser
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/13/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Creating PACS 640 to cross-list with SOC 765.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PACS

Course number: 640

Course ID: 003059

Course title (max. 100 characters including spaces): Political Sociology

Course short title (max. 30 characters including spaces): Political Sociology

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: A critical examination of political and governmental strategies for identifying social problems and managing the conduct of individuals, groups, and populations.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *SOC 765 (cross-list request for SOC 765 also submitted)*

Sections combined/held with:

Rationale for request:

MPACS students have regularly petitioned to take this course in previous years. Formally cross-listing this course expands options for MPACS student course electives and removes the administrative step of applying for approval. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS 640 elective will be cross-listed with the existing SOC 765 course.

Form completed by: Thomas Fraser
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/13/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Creating PACS 642 to cross-list with SOC 782.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PACS

Course number: 642

Course ID: 014550

Course title (max. 100 characters including spaces): Feminism, Law and Governance

Course short title (max. 30 characters including spaces): Feminism, Law and Governance

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: The course will explore the theoretical debates within feminist scholarship surrounding the use of Western liberal legal approaches to prosecute gender violence and improve the socio-economic status of women globally. The course readings will draw from various literatures, including liberal and transnational feminist, postcolonial, and socio-legal and governmentality literatures, to analyse and critically evaluate the concept and deployment of women's empowerment in global contexts.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *SOC 782 (cross-list request for SOC 782 also submitted)*

Sections combined/held with:

Rationale for request:

MPACS students have regularly petitioned to take this course in previous years. Formally cross-listing this course expands options for MPACS student course electives and removes the administrative step of applying for approval. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS 642 elective will be cross-listed with the existing SOC 782 course.

Form completed by: Thomas Fraser
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/13/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies Program Revision Template

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

Faculty: Arts

Program: Master of Peace and Conflict Studies (MPACS)

Program contact name(s): Reina Neufeldt (Graduate Officer) and/or Thomas Fraser (Graduate Studies Coordinator)

Form completed by: Thomas Fraser

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Updating list of cross-listed electives to reflect newly added PACS-SOC cross-listings.

Is this a major modification to the program? No

Rationale for change(s):

SOC 720, 765 & 782 are courses that MPACS students find relevant to their studies. Formally cross-listing these electives will expand the options for MPACS student course electives without the current administrative step of applying for approval from the instructor and Department. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS electives (PACS 638, 640 & 642) will be cross-listed with the existing SOC courses listed above.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/department-peace-and-conflict-studies/master-peace-and-conflict-studies-mpacs

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

Degree requirements
• **Courses**
  ○ The program requires successful completion of 10 courses (5.00 units total).
  ○ Full-time students will normally be expected to complete the degree requirements over a consecutive four-term period, enrolling in three courses for the first two terms and at least two courses in the last two terms.
	Degree requirements
	• **Courses**
	  ○ The program requires successful completion of 10 courses (5.00 units total).
	  ○ Full-time students will normally be expected to complete the degree requirements over a consecutive four-term period, enrolling in three courses for the first two terms and at least two courses in the last two terms.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
○ Part-time students are expected to complete at least two courses per academic year and must complete the program within five years. ○ Students must complete the following courses: ▪ 2.50 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 623 Directed Reading in Peace and Conflict Studies ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training ▪ An additional 1.50 units that can be chosen from: ▪ Additional courses from PACS 610 - PACS 626 ▪ PACS 630/GGOV 610/PSCI 688 Governance of Global Economy ▪ PACS 633/GGOV 640/PSCI 658 Human Rights in the Globalized World	○ Part-time students are expected to complete at least two courses per academic year and must complete the program within five years. ○ Students must complete the following courses: ▪ 2.50 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 623 Directed Reading in Peace and Conflict Studies ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training ▪ An additional 1.50 units that can be chosen from: ▪ Additional courses from PACS 610 - PACS 626 ▪ PACS 630/GGOV 610/PSCI 688 Governance of Global Economy ▪ PACS 633/GGOV 640/PSCI 658 Human Rights in the Globalized World

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
▪ PACS 634/GGOV 630/PSCI 678 Security Ontology-Theory ▪ PACS 635/GGOV 631/PSCI 679 Security Governance: Actors, Institutions, and Issues ▪ PACS 650/INDEV 604 Sustainable Cities ▪ PACS 651/INDEV 605 Economics for Sustainable Development ▪ PACS 652/INDEV 608 Water and Security ▪ PACS 660/PSCI 624 Justice and Gender ▪ PACS 661/PSCI 655 Ethnic Conflict and Conflict Resolution I ▪ PACS 670/TS 637 War and Peace in Christian Theology ▪ PACS 671/TS 619 The Bible, Peace, and Violence ▪ PACS 672/TS 731 Christianity's Encounter with Other Faiths o Students may request permission from the PACS Graduate Advisor to enrol in elective courses in other University of Waterloo or Wilfrid Laurier University graduate courses that will complement their program of study. Permission must also be granted by the department or program in which the courses are offered. o The program offers 3 non-traditional courses which will be managed as follows: ▪ PACS 621 Peace Research: an agreement between the student and the supervising faculty member about research expectations, length of paper, format, topic, types of sources that can be used, and anticipated outcomes is required. Students will be required to prepare a detailed proposal prior to registration in	▪ PACS 634/GGOV 630/PSCI 678 Security Ontology-Theory ▪ PACS 635/GGOV 631/PSCI 679 Security Governance: Actors, Institutions, and Issues ▪ <u>PACS 638/SOC 720 Social Inequality</u> ▪ <u>PACS 640/SOC 765 Political Sociology</u> ▪ <u>PACS 642/SOC 782 Feminism, Law and Governance</u> ▪ PACS 650/INDEV 604 Sustainable Cities ▪ PACS 651/INDEV 605 Economics for Sustainable Development ▪ PACS 652/INDEV 608 Water and Security ▪ PACS 660/PSCI 624 Justice and Gender ▪ PACS 661/PSCI 655 Ethnic Conflict and Conflict Resolution I ▪ PACS 670/TS 637 War and Peace in Christian Theology ▪ PACS 671/TS 619 The Bible, Peace, and Violence ▪ PACS 672/TS 731 Christianity's Encounter with Other Faiths o Students may request permission from the PACS Graduate Advisor to enrol in elective courses in other University of Waterloo or Wilfrid Laurier University graduate courses that will complement their program of study. Permission must also be granted by the department or program in which the courses are offered. o The program offers 3 non-traditional courses which will be managed as follows: ▪ PACS 621 Peace Research: an agreement between the student and the supervising faculty member about research

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
this course that will fully explain the proposed research as well as provide a short bibliography to ensure that adequate sources exist to successfully complete the research. Students will meet periodically with their instructor throughout the term to ensure that milestones are reached. Written work will be evaluated per normal academic criteria. ▪ PACS 625 Internship: students will be required to submit a petition outlining the details of the proposed internship such as place, position, cost, academic work expectations, security concerns, etc. Students will be expected to engage in substantial research on issues related to the host agency as part of the internship. While PACS has the agreement of over ten organizations who are interested in hosting interns, it is anticipated that internships will be negotiated to fit the unique long-term goals of each student. Host agencies will be expected to submit a reference evaluating the student intern at the end of the internship. Written work submitted by the student (evidence of research and reflective report) will be evaluated per normal academic criteria. ▪ PACS 626 Conflict Resolution Skills Training: this course offers an opportunity for students to take skills-training workshops. Program consent is required to ensure that workshops selected by students, plus the expected additional assigned academic work, are appropriate. o Students in the MPACS program may also choose to pursue the Graduate Specialization in Peace Integration. o A Graduate Specialization is a University credential that is recognized	expectations, length of paper, format, topic, types of sources that can be used, and anticipated outcomes is required. Students will be required to prepare a detailed proposal prior to registration in this course that will fully explain the proposed research as well as provide a short bibliography to ensure that adequate sources exist to successfully complete the research. Students will meet periodically with their instructor throughout the term to ensure that milestones are reached. Written work will be evaluated per normal academic criteria. ▪ PACS 625 Internship: students will be required to submit a petition outlining the details of the proposed internship such as place, position, cost, academic work expectations, security concerns, etc. Students will be expected to engage in substantial research on issues related to the host agency as part of the internship. While PACS has the agreement of over ten organizations who are interested in hosting interns, it is anticipated that internships will be negotiated to fit the unique long-term goals of each student. Host agencies will be expected to submit a reference evaluating the student intern at the end of the internship. Written work submitted by the student (evidence of research and reflective report) will be evaluated per normal academic criteria. ▪ PACS 626 Conflict Resolution Skills Training: this course offers an opportunity for students to take skills-training workshops. Program consent is required to ensure that workshops selected by students, plus the expected

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MPACS degree and the requirements associated with the Graduate Specialization. o The course requirements for the Graduate Specialization in Peace Integration are described below. o Students must complete the following courses: ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ 1.50 units from the following list (note: each 0.50 unit/course must be from a different subject code/area): ▪ GGOV 610/PSCI 688/PACS 630 Governance of Global Economy ▪ GGOV 622 Complexity and Global Governance ▪ GGOV 630/PSCI 678/PACS 634 Security Ontology-Theory ▪ GGOV 631/PSCI 679/PACS 635 Security Governance: Actors, Institutions, and Issues ▪ GGOV 633 Managing Nuclear Risk ▪ GGOV 662/SOC 781 Global Development Governance ▪ INDEV 604/PACS 650 Sustainable Cities ▪ INDEV 605/PACS 651 Economics for Sustainable Development ▪ INDEV 608/PACS 652 Water and Security ▪ INDEV 609 Sustainability Concepts,	additional assigned academic work, are appropriate. o Students in the MPACS program may also choose to pursue the Graduate Specialization in Peace Integration. o A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MPACS degree and the requirements associated with the Graduate Specialization. o The course requirements for the Graduate Specialization in Peace Integration are described below. o Students must complete the following courses: ▪ PACS 605 Conflict Transformation and Peacebuilding ▪ 1.50 units from the following list (note: each 0.50 unit/course must be from a different subject code/area): ▪ GGOV 610/PSCI 688/PACS 630 Governance of Global Economy ▪ GGOV 622 Complexity and Global Governance ▪ GGOV 630/PSCI 678/PACS 634 Security Ontology-Theory ▪ GGOV 631/PSCI 679/PACS 635 Security Governance: Actors, Institutions, and Issues ▪ GGOV 633 Managing Nuclear Risk ▪ GGOV 662/SOC 781 Global Development Governance ▪ INDEV 604/PACS 650 Sustainable Cities

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
Applications and Key Debates ▪ INDEV 613 Water, Human Security and Development ▪ GEMCC 602 Climate Change: Vulnerability and Adaptation ▪ GEMCC 622 Climate Change, Natural Hazards and Disaster Risk Reduction ▪ GEMCC 640 Climate Change Governance: From Global Treaties to Local Innovation ▪ HLTH 603 Health Systems and Policy ▪ HLTH 604 Health and the Environment (blended on-campus/online offering) ▪ HLTH 607 Social and Cultural Aspects of Public Health (blended on-campus/online offering) ▪ HLTH 614 Foundations of Program Evaluation ▪ HLTH 632 Health Economics and Public Health (online offering) ▪ HLTH 661 Geographic Information Systems and Public Health (online offering) ▪ HLTH 662 Global Health ▪ 2.00 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace ▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements	▪ INDEV 605/PACS 651 Economics for Sustainable Development ▪ INDEV 608/PACS 652 Water and Security ▪ INDEV 609 Sustainability Concepts, Applications and Key Debates ▪ INDEV 613 Water, Human Security and Development ▪ GEMCC 602 Climate Change: Vulnerability and Adaptation ▪ GEMCC 622 Climate Change, Natural Hazards and Disaster Risk Reduction ▪ GEMCC 640 Climate Change Governance: From Global Treaties to Local Innovation ▪ HLTH 603 Health Systems and Policy ▪ HLTH 604 Health and the Environment (blended on-campus/online offering) ▪ HLTH 607 Social and Cultural Aspects of Public Health (blended on-campus/online offering) ▪ HLTH 614 Foundations of Program Evaluation ▪ HLTH 632 Health Economics and Public Health (online offering) ▪ HLTH 661 Geographic Information Systems and Public Health (online offering) ▪ HLTH 662 Global Health ▪ 2.00 units of: ▪ PACS 601 Systems of Peace, Order, and Good Governance ▪ PACS 602 The Practice of Peace

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training	▪ PACS 603 Building Civil Society ▪ PACS 604 Conflict Analysis ▪ At least 1.00 units of: ▪ PACS 610 Contemporary Nonviolent Movements ▪ PACS 611 Reconciliation ▪ PACS 612 Culture, Religion, and Peacebuilding ▪ PACS 620 Special Topics in Peace and Conflict Studies ▪ PACS 621 Peace Research ▪ PACS 625 Internship ▪ PACS 626 Conflict Resolution Skills Training

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

Currently registered students will not be impacted by these changes. Formally cross-listing these electives expands options for MPACS student course electives and removes the administrative step of applying for approval.

Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/13/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing PACS 638 with SOC 720.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 720

Course ID: 003050

Course title (max. 100 characters including spaces): Social Inequality

Course short title (max. 30 characters including spaces): Social Inequality

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course examines the dimensions, causes, and consequences of social inequality. Focus will vary by instructor specialization.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PACS 638 (cross-list request for PACS 638 also submitted)*

Sections combined/held with:

Rationale for request:

This course has been identified as a relevant cross-listing for MPACS students. Formally cross-listing this course expands options for MPACS student course electives and removes the administrative step of applying for approval. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS 638 elective will be cross-listed with the existing SOC 720 course.

Form completed by: Owen Gallupe
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/31/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing PACS 640 with SOC 765.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 765

Course ID: 003059

Course title (max. 100 characters including spaces): Political Sociology

Course short title (max. 30 characters including spaces): Political Sociology

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: A critical examination of political and governmental strategies for identifying social problems and managing the conduct of individuals, groups, and populations.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PACS 640 (cross-list request for PACS 640 also submitted)*

Sections combined/held with:

Rationale for request:

MPACS students have regularly petitioned to take this course in previous years. Formally cross-listing this course expands options for MPACS student course electives and removes the administrative step of applying for approval. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS 640 elective will be cross-listed with the existing SOC 765 course.

Form completed by: Owen Gallupe
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/31/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing PACS 642 with SOC 782.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 782

Course ID: 014550

Course title (max. 100 characters including spaces): Feminism, Law and Governance

Course short title (max. 30 characters including spaces): Feminism, Law and Governance

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: The course will explore the theoretical debates within feminist scholarship surrounding the use of Western liberal legal approaches to prosecute gender violence and improve the socio-economic status of women globally. The course readings will draw from various literatures, including liberal and transnational feminist, postcolonial, and socio-legal and governmentality literatures, to analyse and critically evaluate the concept and deployment of women's empowerment in global contexts.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PACS 642 (cross-list request for PACS 642 also submitted)*

Sections combined/held with:

Rationale for request:

MPACS students have regularly petitioned to take this course in previous years. Formally cross-listing this course expands options for MPACS student course electives and removes the administrative step of applying for approval. Sociology benefits from the arrangement with additional students in their graduate courses. The new PACS 642 elective will be cross-listed with the existing SOC 782 course.

Form completed by: Owen Gallupe
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/31/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 759

Course ID: 003057

Course title (max. 100 characters including spaces): Sociology of Work and Occupations

Course short title (max. 30 characters including spaces):

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: The seminar examines extant theoretical perspectives on the study of work. Current theories of

work, critical issues in the field, and changes in the roles of occupations in the social structure are examined with the view towards new perceptions of work in our society.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:
The course has not been offered in at least 10 years and is unlikely to be offered again in the near future.

Form completed by:
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/10/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 760

Course ID: 003058

Course title (max. 100 characters including spaces): Social Networks

Course short title (max. 30 characters including spaces):

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: An examination of the use of the concept "social network" in studying social structure; including

the applicability of the concept to social theories, methods of operationalizing and analyzing social networks, and examples of substantive research employing the concept.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

The course has not been offered since Winter 2017 and is unlikely to be offered again in the near future.

Form completed by:
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/10/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 776

Course ID: 003061

Course title (max. 100 characters including spaces): Sociology of Knowledge

Course short title (max. 30 characters including spaces):

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: The seminar undertakes to develop a general theory of the relation of social thought to social

action, comparative value systems and the role of the scientist, artist and intellectual in society.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:
The course has not been offered since Winter 2013 and is unlikely to be offered again in the near future.

Form completed by:
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/10/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SOC

Course number: 723

Course ID:

Course title (max. 100 characters including spaces): Technology and Gender

Course short title (max. 30 characters including spaces): Technology and Gender

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course is an in-depth study into the histories, theories, and design-based methodologies of

gender and technology, including topics such as algorithms, A.I., cyborgs, and beauty filters. Using science and technology studies and feminist technoscience as frameworks, we will explore how the gendering of technology may risk reinforcing gendered stereotypes in society and culture--but also, how women and non-binary peoples may be empowered through technological tools and communities.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Anti-requisites: SOC 719 Topic 7

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:
Regularizing a course that has previously been offered under SOC 719 "Selected Topics in Sociology" (topic 7). It is in line with our department's thematic areas of "Social Inequality and Public Policy" and "Knowledge, Education, and Digital Culture".

Form completed by:
Department/School approval date (mm/dd/yy): 01/26/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/10/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy)

UNIVERSITY OF WATERLOO

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Creating PSCI 609 to cross list with GGOV 660/SUSM 660.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PSCI

Course number: 609

Course ID: 015932

Course title (max. 100 characters including spaces): Public International Law

Course short title (max. 30 characters including spaces): Public Intl Law

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This survey course will provide students with a systematic introduction to the international legal system. Topics to be covered include: the origins and nature of the international legal system; the formation, sources and application of international law; the law of treaties; international legal personality; the institutional framework of international law; the relationship between international law and municipal law; the relationship between states and territory; law of the sea; state jurisdiction; jurisdictional immunities of states; state responsibility; and a selection of substantive international legal topics including, as time permits, international trade, international investment, the use of force by states, and/or international humanitarian law.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *GGOV 660 / SUSM 660 (course revision requests to add the PSCI cross-listing to be submitted by GGOV and SUSM)*

Sections combined/held with:

Rationale for request:

To create more PSCI course options for graduate students and help boost overall enrolments for this course through joint cross-listing.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 11/15/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PSCI

Course number: 649

Course ID:

Course title (max. 100 characters including spaces): How Political Institutions Change Society

Course short title (max. 30 characters including spaces): How Political Inst Change Soc

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: The objective of this course is to study how the design and nature of political institutions in a

country affect various aspects of its society, such as the cost of living, gender and race relationships, economic growth, people's access to education, and the nature of rural life. The course will compare the social impact of various political institutional features, such as regime types, polarization, government partisanship, and the rules of electoral competition.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Sections combined/held with:

Rationale for request:

To create more PSCI course options for graduate students with a special interest in comparative politics.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 01/12/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing GGOV 654 with PSCI 610.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PSCI

Course number: 610

Course ID: 016365

Course title (max. 100 characters including spaces): International Relations Theory

Course short title (max. 30 characters including spaces): International Relations Theory

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course examines the major theories of International Relations (IR) and the current state of the field. It addresses the major IR theories, how they inform advanced research, and how they relate to the conduct of world politics.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *GGOV 654 (course revision request to add the GGOV cross-listing to be submitted by GGOV*).

Sections combined/held with:

Rationale for request:

To help boost overall enrolments for this course through joint cross-listing and since many GGOV students are likely to take interest in this course.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing GGOV 655 with PSCI 611.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PSCI

Course number: 611

Course ID: 016366

Course title (max. 100 characters including spaces): Current Issues in International Relations

Course short title (max. 30 characters including spaces): Curr. Issues in Intl Relations

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course examines recent trends in world politics, their origins, and their policy implications.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *GGOV 655 (course revision request to add the GGOV cross-listing to be submitted by GGOV).*

Sections combined/held with:

Rationale for request:

To help boost overall enrolments for this course through joint cross-listing and since many GGOV students are likely to take interest in this course.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts & Environment

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Creating GGOV 654 to cross list with PSCI 610.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: GGOV

Course number: 654

Course ID: 016365

Course title (max. 100 characters including spaces): International Relations Theory

Course short title (max. 30 characters including spaces): International Relations Theory

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course examines the major theories of International Relations (IR) and the current state of the field. It addresses the major IR theories, how they inform advanced research, and how they relate to the conduct of world politics.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PSCI 610 (course revision request to add the GGOV cross-listing to be submitted by the PSCI department).*

Sections combined/held with:

Rationale for request:

To create more GGOV course options for grad students interested in International Relations and help boost overall enrolments for this course through joint cross-listing.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts & Environment

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Creating GGOV 655 to cross list with PSCI 611.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: GGOV

Course number: 655

Course ID: 016366

Course title (max. 100 characters including spaces): Current Issues in International Relations

Course short title (max. 30 characters including spaces): Curr. Issues in Intl Relations

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course examines recent trends in world politics, their origins, and their policy implications.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *PSCI 611 (course revision request to add the GGOV cross-listing to be submitted by the PSCI department).*

Sections combined/held with:

Rationale for request:

To create more GGOV course options for graduate students interested in International Relations and help boost overall enrolments for this course through joint cross-listing.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Arts & Environment

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing PSCI 609 with GGOV 660/SUSM 660.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: GGOV

Course number: 660

Course ID: 015932

Course title (max. 100 characters including spaces): Public International Law

Course short title (max. 30 characters including spaces): Public Intl Law

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This survey course will provide students with a systematic introduction to the international legal system. Topics to be covered include: the origins and nature of the international legal system; the formation, sources and application of international law; the law of treaties; international legal personality; the institutional framework of international law; the relationship between international law and municipal law; the relationship between states and territory; law of the sea; state jurisdiction; jurisdictional immunities of states; state responsibility; and a selection of substantive international legal topics including, as time permits, international trade, international investment, the use of force by states, and/or international humanitarian law.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *SUSM 660 / PSCI 609 (course revision requests to add the PSCI cross-listing to be submitted by the SUSM school, and course activation paperwork to be submitted by the PSCI department)*

Sections combined/held with:

Rationale for request:

To help boost overall enrolments for this course through joint cross-listing and since PSCI students are likely to take interest in this course.

Form completed by: Maysah Eid
Department/School approval date (mm/dd/yy): 11/15/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies

Program Revision Template

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

Faculty: Arts & Environment

Program: Master of Arts (MA) in Global Governance

Program contact name(s): David Welch, Andrew Thompson, Rebecca Deschamps

Form completed by: Maysah Eid

Description of proposed changes:

Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Adding GGOV 654 (cross listed with PSCI 610) International Relations Theory and GGOV 655 (cross listed with PSCI 611) Current Issues in International Relations to the list of electives component.

Is this a major modification to the program? No

Rationale for change(s):

To create more GGOV course options for graduate students interested in International Relations and help boost overall enrolments for these courses through joint cross-listings.

Proposed effective date: Term: Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/arts/global-governance/master-arts-ma-global-governance

https://uwaterloo.ca/graduate-studies-academic-calendar/environment/global-governance/master-arts-ma-global-governance

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
Degree requirements **Courses** • Students must complete 6 courses during the first two terms, as follows: o Core course component: GGOV 600 Global Governance o History component: 1 of the following courses (or an appropriate alternative):	**Degree requirements** **Courses** • Students must complete 6 courses during the first two terms, as follows: o Core course component: GGOV 600 Global Governance o History component: 1 of the following courses (or an appropriate alternative):

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
▪ HIST 605 Global Governance in Historical Perspective ▪ HIST 606 International Development in Historical Perspective ▪ HIST 607 Human Rights in Historical Perspective I ▪ HIST 608 Human Rights in Historical Perspective II ▪ HIST 612 Global Indigenous Rights ▪ HIST 660 Transnational and Global History: Old Problems and New Directions o Economics component: 1 of the following courses (or an appropriate alternative): ▪ GGOV 610/PSCI 688/PACS 630 Governance of Global Economy ▪ GGOV 613/PSCI 668 The Politics of National Innovation Systems ▪ GGOV 614/PSCI 614 Global Business and Development ▪ GGOV 618 Special Topics in Global Political Economy ▪ GGOV 619 Readings in Global Political Economy ▪ GGOV 621/PSCI 606/ERS 606 Governing Global Food and Agriculture Systems ▪ GGOV 663/PSCI 619 China and Global Governance ▪ ECON 631 International Trade ▪ ECON 635 International Trade and Development ▪ ECON 637 Economic Analysis and Global Governance ▪ ECON 673 Special Topics in Economics o Political Science component: 1 of the following courses: ▪ GGOV 610/PSCI 688 Governance of Global Economy (GV 731 at WLU) ▪ GGOV 620/ERS 604/PSCI 604 Advanced Topics in Global Environmental Governance (GV 732 at WLU) ▪ GGOV 621/ERS 606/PSCI 606 Governing Global Food and Agriculture Systems	▪ HIST 605 Global Governance in Historical Perspective ▪ HIST 606 International Development in Historical Perspective ▪ HIST 607 Human Rights in Historical Perspective I ▪ HIST 608 Human Rights in Historical Perspective II ▪ HIST 612 Global Indigenous Rights ▪ HIST 660 Transnational and Global History: Old Problems and New Directions o Economics component: 1 of the following courses (or an appropriate alternative): ▪ GGOV 610/PSCI 688/PACS 630 Governance of Global Economy ▪ GGOV 613/PSCI 668 The Politics of National Innovation Systems ▪ GGOV 614/PSCI 614 Global Business and Development ▪ GGOV 618 Special Topics in Global Political Economy ▪ GGOV 619 Readings in Global Political Economy ▪ GGOV 621/PSCI 606/ERS 606 Governing Global Food and Agriculture Systems ▪ GGOV 663/PSCI 619 China and Global Governance ▪ ECON 631 International Trade ▪ ECON 635 International Trade and Development ▪ ECON 637 Economic Analysis and Global Governance ▪ ECON 673 Special Topics in Economics o Political Science component: 1 of the following courses: ▪ GGOV 610/PSCI 688 Governance of Global Economy (GV 731 at WLU) ▪ GGOV 620/ERS 604/PSCI 604 Advanced Topics in Global Environmental Governance (GV 732 at WLU) ▪ GGOV 621/ERS 606/PSCI 606 Governing Global Food and Agriculture Systems

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
▪ GGOV 630/PSCI 678/PACS 634 Security Ontology-Theory (GV 733 at WLU) ▪ GGOV 631/PSCI 679/PACS 635 Security Governance: Actors, Institutions, and Issues ▪ GGOV 640/PSCI 658/PACS 633 Human Rights in the Globalized World ▪ GGOV 642/PSCI 639 Global Social Governance (GV 735 at WLU) ▪ PSCI 657/GGOV 650 International Organizations and Global Governance o Elective component: 2 additional courses chosen from the following list: ▪ ECON 635 International Trade and Development ▪ GGOV 613/PSCI 668 The Politics of National Innovation Systems ▪ GGOV 614/PSCI 614 Global Business and Development ▪ GGOV 618 Special Topics in Global Political Economy ▪ GGOV 619 Readings in Global Political Economy ▪ GGOV 622 Complexity and Global Governance ▪ GGOV 628 Topics in Global Environmental Governance ▪ GGOV 629 Readings in Global Environment ▪ GGOV 633 Managing Nuclear Risk ▪ GGOV 634/PSCI 620 Gender and Global Politics ▪ GGOV 638 Special Topics in Conflict and Security ▪ GGOV 639 Readings in Conflict and Security ▪ GGOV 641 International Human Rights (GV 760 at WLU) ▪ GGOV 644/SOC 784 International Migration: Practice, Theory and Regulation ▪ GGOV 648 Special Topics in Global Justice and Human Rights ▪ GGOV 649 Readings in Global Justice ▪ GGOV 653 International Organizations and Public Policy	▪ GGOV 630/PSCI 678/PACS 634 Security Ontology-Theory (GV 733 at WLU) ▪ GGOV 631/PSCI 679/PACS 635 Security Governance: Actors, Institutions, and Issues ▪ GGOV 640/PSCI 658/PACS 633 Human Rights in the Globalized World ▪ GGOV 642/PSCI 639 Global Social Governance (GV 735 at WLU) ▪ PSCI 657/GGOV 650 International Organizations and Global Governance o Elective component: 2 additional courses chosen from the following list: ▪ ECON 635 International Trade and Development ▪ GGOV 613/PSCI 668 The Politics of National Innovation Systems ▪ GGOV 614/PSCI 614 Global Business and Development ▪ GGOV 618 Special Topics in Global Political Economy ▪ GGOV 619 Readings in Global Political Economy ▪ GGOV 622 Complexity and Global Governance ▪ GGOV 628 Topics in Global Environmental Governance ▪ GGOV 629 Readings in Global Environment ▪ GGOV 633 Managing Nuclear Risk ▪ GGOV 634/PSCI 620 Gender and Global Politics ▪ GGOV 638 Special Topics in Conflict and Security ▪ GGOV 639 Readings in Conflict and Security ▪ GGOV 654/PSCI 610 International Relations Theory ▪ GGOV 655/PSCI 611 Current Issues in International Relations ▪ GGOV 641 International Human Rights (GV 760 at WLU) ▪ GGOV 644/SOC 784 International Migration: Practice, Theory and Regulation ▪ GGOV 648 Special Topics in Global Justice and Human Rights

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
▪ GGOV 658 Special Topics in Multilateral Institutions and Diplomacy ▪ GGOV 659 Readings in Multilateral Institutions and Diplomacy ▪ GGOV 660 Public International Law ▪ GGOV 661 International Organizations Law ▪ GGOV 662/SOC 781 Global Development Governance ▪ GGOV 663 China and Global Governance ▪ GGOV 668 Special Topics in Global Social Governance ▪ GGOV 669 Readings in Global Social Governance ▪ HIST 604 Theory and Practice of Insurgency and Counterinsurgency: Historical and Contemporary Issues ▪ HIST 606 International Development in Historical Perspective ▪ HIST 610 War and Society in the Twentieth Century I ▪ HIST 611 War and Society in the Twentieth Century II ▪ HIST 626 Modern European History I ▪ HIST 627 Modern European History II ▪ HIST 632 History of the United States I ▪ HIST 651 Historians and Public Policy ▪ PSCI 639/GGOV 642 Global Social Governance ▪ PSCI 651 Democracy and Development ▪ PSCI 657/GGOV 650 International Organizations and Global Governance ▪ PSCI 658/GGOV 640 Human Rights in the Globalized World ▪ PSCI 680 Critical Security Studies ▪ PSCI 684 Special Topics in International Diplomacy ▪ Note: Not all courses are offered each year and more courses may be available. Consult the respective departments for information on	▪ GGOV 649 Readings in Global Justice ▪ GGOV 653 International Organizations and Public Policy ▪ GGOV 658 Special Topics in Multilateral Institutions and Diplomacy ▪ GGOV 659 Readings in Multilateral Institutions and Diplomacy ▪ GGOV 660 Public International Law ▪ GGOV 661 International Organizations Law ▪ GGOV 662/SOC 781 Global Development Governance ▪ GGOV 663 China and Global Governance ▪ GGOV 668 Special Topics in Global Social Governance ▪ GGOV 669 Readings in Global Social Governance ▪ HIST 604 Theory and Practice of Insurgency and Counterinsurgency: Historical and Contemporary Issues ▪ HIST 606 International Development in Historical Perspective ▪ HIST 610 War and Society in the Twentieth Century I ▪ HIST 611 War and Society in the Twentieth Century II ▪ HIST 626 Modern European History I ▪ HIST 627 Modern European History II ▪ HIST 632 History of the United States I ▪ HIST 651 Historians and Public Policy ▪ PSCI 639/GGOV 642 Global Social Governance ▪ PSCI 651 Democracy and Development ▪ PSCI 657/GGOV 650 International Organizations and Global Governance ▪ PSCI 658/GGOV 640 Human Rights in the Globalized World ▪ PSCI 680 Critical Security Studies ▪ PSCI 684 Special Topics in International Diplomacy

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
available courses in any given year. Consult the graduate studies calendar for full course descriptions.	▪ Note: Not all courses are offered each year and more courses may be available. Consult the respective departments for information on available courses in any given year. Consult the graduate studies calendar for full course descriptions.

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

Students will have more elective options.

Department/School approval date (mm/dd/yy): 12/06/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

UNIVERSITY OF WATERLOO
FACULTY OF ENGINEERING

M E M O

TO: Kathy Winter, Assistant University Secretary & Privacy Officer Secretariat

FROM: S. Sivoththaman, Associate Dean, Graduate Studies, Faculty of Engineering

RE: Senate Graduate and Research Council

DATE: March 27, 2023

Please place the following motions forward for approval at the next meeting of the SGRC. These changes were approved by the EFC on March 21, 2023.

Items for Approval:

These items for consideration on SGRC Regular Agenda

1. The department of **Mechanical and Mechatronics Engineering** would like to make the following calendar changes
   a. Addition of direct entry Co-operative program to the MEng MME program.
   b. Discontinuation of the Type 2 Graduate Diploma in Design Engineering and Graduate Diploma in Design Engineering – Co-operative Program.

Rationale for Request:

a. The direct entry co-op MEng program aligns with the University's and Province's vision and policy on "Work Integrated Learning" (WIL). The new program will allow the selected MEng students to apply their knowledge gained in their coursework and reinforce their professional development. It also builds upon the success of the GDip in Design Engineering with co-op available in the Department of Mechanical and Mechatronics Engineering (MME) that will be discontinued in Fall 2023. The new MEng program will offer co-op opportunities to a wider group of MEng students.
   The new program will be highly selective to maintain high quality and reputation among employers. Initially, the program capacity will be limited to 20 students distributed over the three terms. The program capacity will be reviewed yearly based on the number of placements/work experiences, types of jobs and employers' evaluations. In the event of a student not finding a co-op work experience, the student may transfer to the regular MEng without co-op.
   MME has collected feedback from their graduate students through different surveys and informal discussions. Access to co-op and better preparation for the job market are regular requests from MEng students. Thus, the new program will respond to the student desire of WIL in their MEng.
   This direct entry co-op MEng program will attract the best applicants to the MEng program in MME including domestic students who graduated from a program without co-op in Canada.

International students will be able to take co-op jobs without impacting their Post Graduate Work Permit (PGWP).
The co-op program/option will be supported by Co-operative Education. Attached is the Feasibility Report that was completed by Co-operative Education.

b. The GDip in Design Engineering and GDip in Design Engineering - Co-operative Program have relied on the availability of one faculty member with unique expertise in design, responsible for selecting students and teaching the three core courses (ME 680, ME 681 and ME 682). This faculty member is retiring in July 2023. The Department of Mechanical and Mechatronics Engineering does not have adequate teaching resources to continue the GDip in the same mode of operation and there is no plan in the short-term of hiring a new faculty member capable of teaching ME 680, ME 681 and ME 682 on a regular basis.
Further, the Department of Mechanical and Mechatronics Engineering is in the process of restructuring its MEng program with new graduate specializations and a direct entry co-op option that will offer alternatives to applicants interested in mechanical and mechatronics engineering MEng and co-op.

2. As per the **Collaborative Nanotechnology Program's** guidelines, the course changes in this motion have been approved by all six member departments of the program:

a. Removing the following courses from the graduate academic calendar
    i. Topics within Nano 701 (Fundamentals of Nanotechnology)
    ii. Topics within Nano 702 (Nanotechnology Tools)
b. Addition of new course NANO 707 (From Atoms to Crystals, Quantum Wells, Wires and Dots) to the Nanotechnology program
c. Adding NANO 707 to the list of Nanotechnology core courses, which are a component of the Nanotechnology collaborative program.

Rationale for Request:

a. These courses were previously inactivated when they were replaced by the NANO 600 series of courses and no longer meet core degree requirements for the Nanotechnology Collaborative Graduate programs. However, they were retained in the UW Graduate Studies Calendar pending degree completion by students who may have taken them as part of their degree requirements. They should no longer appear, per former approval that they will not be offered in the future. Note: This will remove them from the current calendar (as they are no longer available) but they will be retained in the calendar archive for anyone who took them.
b. NANO 701 and 702 topic courses are being inactivated due to the approval of regularly offered NANO 600 level courses. The proposed NANO 707 course combines the content of NANO 701 topics 02 and 14. Dedicated NANO core course modules will be more advantageous when delivered as full-term, 0.50 credit weight courses.
c. NANO 707 will be offered with a credit weight of 0.50, thereby increasing the number of core courses offered in the Nanotechnology Collaborative Graduate programs list of approved courses. This course is a blend of NANO 701: T02 (Solid State Physcs&Chemistry) and T14 (From Atoms to Crystals), previously offered as technical electives with course credit weights of 0.25.

3. The department of **Chemical Engineering** would like to make the following calendar changes

a. Addition of a new course CHE 603 (Chemical Engineering Thermodynamics) to the Chemical Engineering program

Rationale for Request:

a. This course is being proposed in direct response to the external assessment and self-study of the CHE graduate program conducted in 2017. As a result of this process, the Department committed to "offer a course in Thermodynamics. The exact timing of the first offering depends on resource availability, but the Department is aiming to deliver the course in 2019." Chemical Engineering Thermodynamics is a foundational part of a CHE curriculum, as is reflected by all Canadian CHE graduate programs offering a similar course except for UW's department. The introduction of this course will correct this issue and significantly improve the rigor of the CHE graduate program.

4. The department of **Systems Design Engineering** would like to make the following calendar changes
    a. Update the Master's Thesis Examining Committee requirements for all MASc in SYDE programs, this includes the MASc, MASc Nanotechnology, and MASc Aeronautics to reflect the interdisciplinary nature of the program.

Rationale for Request:

a. Systems Design Engineering is a department which prides itself on the interdisciplinary and diverse nature of its researchers. To ensure students receive feedback that encourages this interdisciplinary mindset, it is important that students' thesis committees include members from outside the Department of Systems Design Engineering.

5. The department of **Electrical and Computer Engineering** would like to make the following calendar changes
    a. Regarding the MEng specialization in Sustainable Energy: Remove ECE 663 (Energy Processing) from the list of compulsory courses and add it to the list of elective courses.

Rationale for Request:

a. Provides M.Eng. students seeking this specialization more flexibility to choose their electives

SS/em

Graduate Studies
Program Revision Template

This item for consideration on SGRC Regular Agenda

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

Faculty: Engineering

Program: Master of Engineering (MEng) in Mechanical and Mechatronics Engineering – Co-operative Program

Program contact name(s): Cecile Devaud

Form completed by: Cecile Devaud

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Adding a direct entry Co-operative program/option to the MEng in Mechanical and Mechatronics Engineering program.

Is this a major modification to the program? Yes

Rationale for change(s):

The direct entry co-op MEng program aligns with the University's and Province's vision and policy on "Work Integrated Learning" (WIL). The new program will allow the selected MEng students to apply their knowledge gained in their coursework and reinforce their professional development. It also builds upon the success of the GDip in Design Engineering with co-op available in the Department of Mechanical and Mechatronics Engineering (MME) that will be discontinued in Fall 2023. The new MEng program will offer co-op opportunities to a wider group of MEng students.

The new program will be highly selective to maintain high quality and reputation among employers. Initially, the program capacity will be limited to 20 students distributed over the three terms. The program capacity will be reviewed yearly based on the number of placements/work experiences, types of jobs and employers' evaluations. In the event of a student not finding a co-op work experience, the student may transfer to the regular MEng without co-op.

MME has collected feedback from their graduate students through different surveys and informal discussions. Access to co-op and better preparation for the job market are regular requests from MEng students. Thus, the new program will respond to the student desire of WIL in their MEng.

This direct entry co-op MEng program will attract the best applicants to the MEng program in MME including domestic students who graduated from a program without co-op in Canada. International students will be able to take co-op jobs without impacting their Post Graduate Work Permit (PGWP).

The co-op program/option will be supported by Co-operative Education. Attached is the Feasibility Report that was completed by Co-operative Education.

Proposed effective date: Term: Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-mechanical-and-mechatronics-engineering

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:

MASTER OF ENGINEERING (MENG) IN MECHANICAL AND MECHATRONICS ENGINEERING
 	
Graduate specializations
 	
• Green Energy
 	
Program information
 	
• **Admit term(s)**
  ○ Fall
  ○ Winter
  ○ Spring
 	
• **Delivery mode**
  ○ On-campus
 	
• **Length of program**
  ○ Full-time: 4 terms (16 months)
  ○ Part-time: 8 terms (32 months)
 	
• **Program type**
  ○ Master's
  ○ Professional
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Coursework
 	
• **Additional program information**
  ○ The University of Waterloo does not provide funding for MEng in Mechanical and Mechatronics Engineering students, and the candidates are expected to be self-supporting.
 	
Admission requirements
	MASTER OF ENGINEERING (MENG) IN MECHANICAL AND MECHATRONICS ENGINEERING - CO-OPERATIVE PROGRAM
	
	Graduate specializations
	
	• Green Energy
	
	Program information
	
	• **Admit term(s)**
	  ○ Fall
	  ○ Winter
	  ○ Spring
	
	• **Delivery mode**
	  ○ On-campus
	
	• **Length of program**
	  ○ Full-time: 5-6 terms (20-24 months)
	
	• **Program type**
	  ○ Co-operative
	  ○ Master's
	  ○ Professional
	
	• **Registration option(s)**
	  ○ Full-time
	
	• **Study option(s)**
	  ○ Coursework
	
	• **Additional program information**
	  ○ The University of Waterloo does not provide funding for MEng in Mechanical and Mechatronics Engineering students, and the candidates are expected to be self-supporting.
	
	Admission requirements

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:

• **Minimum requirements**
  ○ The Department of Mechanical and Mechatronics Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada.
  ○ Graduate Record Examination (GRE) test scores (requirement only for applicants who completed their undergraduate degree from an institution located outside of Canada or the United States of America).
 	
• **Application materials**
  ○ Résumé
  ○ Supplementary information form
  ○ Transcript(s)
 	
• **References**
  ○ Number of references: 2
  ○ Type of references: academic
 	
• **English language proficiency (ELP)** (if applicable)
	• **Minimum requirements**
	  ○ The Department of Mechanical and Mechatronics Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada.
	  ○ Graduate Record Examination (GRE) test scores (requirement only for applicants who completed their undergraduate degree from an institution located outside of Canada or the United States of America).
	
	• **Application materials**
	  ○ Résumé
	  ○ Supplementary information form
	  ○ Transcript(s)
	
	• **References**
	  ○ Number of references: 2
	  ○ Type of references: academic
	
	• **English language proficiency (ELP)** (if applicable)

Degree requirements
 	
• **Graduate Academic Integrity Module (Graduate AIM)**
 	
• **Courses**
  ○ Students must complete 8 one-term (0.50 unit weight) graduate level courses (or courses acceptable for graduate credit).
  ○ A maximum of 2 500-level courses may be counted for credit.
	Degree requirements
	
	<u>The MEng in Mechanical and Mechatronics Engineering – Co-operative Program will enable students to combine graduate studies with work experience.</u>
	
	<u>The program includes completion of 1-2 required work terms. The work term(s) typically takes place in term 3 (or terms 3 and 4). The work term(s) must meet CEE standard work term requirements and Departmental requirements. Students should apply to jobs related to their program of study. Note: the program must start and end on an academic term. Students in the</u>

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:
○ An English for Multilingual Speakers (EMLS) technical/professional course is normally required for all students who were not English Language Proficiency (ELP) exempt at the time of admission. This course is normally taken in the first term of the program. ○ The EMLS communication course can be waived at the discretion of the Department. ○ At least 2 out of the 8 required courses must be taken from the following list of ME graduate core courses: ▪ ME 620 Mechanics of Continua ▪ ME 621 Advanced Finite Element Method ▪ ME 631 Mechanical Metallurgy ▪ ME 632 Experimental Methods in Materials Engineering ▪ ME 640 Autonomous Mobile Robotics ▪ ME 649 Control of Machines and Processes ▪ ME 651 Heat Conduction ▪ ME 652 Convective Heat Transfer ▪ ME 653 Radiation Heat Transfer ▪ ME 662 Advanced Fluid Mechanics ▪ ME 664 Turbulent Flow ○ MEng students completing 1 of the 2 Graduate Diploma (GDip) program options or the Graduate Specialization are allowed to use the mandatory courses from the GDips or Graduate Specialization to count toward 2 of the 8 core courses. ○ MEng students must attend at least 4 MME research seminars. ○ Additional Faculty regulations concerning Master's degree requirements are: ▪ The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure). ▪ At least half of the courses used for credit must normally be Faculty of Engineering courses and the other half need to be	<u>program are encouraged to complete COOP 601 Career Success Strategies in the academic term prior to the first work term.</u> • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must complete 8 one-term (0.50 unit weight) graduate level courses (or courses acceptable for graduate credit). ○ A maximum of 2 500-level courses may be counted for credit. ○ An English for Multilingual Speakers (EMLS) technical/professional course is normally required for all students who were not English Language Proficiency (ELP) exempt at the time of admission. This course is normally taken in the first term of the program. ○ The EMLS communication course can be waived at the discretion of the Department. ○ At least 2 out of the 8 required courses must be taken from the following list of ME graduate core courses: ▪ ME 620 Mechanics of Continua ▪ ME 621 Advanced Finite Element Method ▪ ME 631 Mechanical Metallurgy ▪ ME 632 Experimental Methods in Materials Engineering ▪ ME 640 Autonomous Mobile Robotics ▪ ME 649 Control of Machines and Processes ▪ ME 651 Heat Conduction ▪ ME 652 Convective Heat Transfer ▪ ME 653 Radiation Heat Transfer ▪ ME 662 Advanced Fluid Mechanics ▪ ME 664 Turbulent Flow ○ MEng students completing 1 of the 2 Graduate Diploma (GDip) program options or the Graduate Specialization are allowed to use the mandatory courses from the GDips or Graduate Specialization to count toward 2 of the 8 core courses.

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:
Mechanical and Mechatronics Engineering courses. ○ Students in the MEng in Mechanical and Mechatronics Engineering program may choose to pursue the following Graduate Specialization: 1. Green Energy ○ A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. ○ All MEng Graduate Specializations in Mechanical and Mechatronics Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for the Graduate Specialization are described below. 1. Graduate Specialization in Green Energy ○ To receive the Graduate Specialization in Green Energy, students must successfully complete 1 compulsory course and 3 elective courses: ▪ Compulsory course: ▪ ME 659 Energy and Environment ▪ Elective courses (choose 3 from the following list):	○ MEng students must attend at least 4 MME research seminars. ○ Additional Faculty regulations concerning Master's degree requirements are: ▪ The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure). ▪ At least half of the courses used for credit must normally be Faculty of Engineering courses and the other half need to be Mechanical and Mechatronics Engineering courses. ○ Students in the MEng in Mechanical and Mechatronics Engineering program may choose to pursue the following Graduate Specialization: 1. Green Energy ○ A Graduate Specialization is a university credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. ○ All MEng Graduate Specializations in Mechanical and Mechatronics Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:
▪ ME 738 Special Topics in Materials: Hydrogen Storage Materials ▪ ME 751 Fuel Cell Technology ▪ ME 753 Solar Energy ▪ ME 760 Special Topics in Thermal Engineering: Low Energy Building Systems ▪ ME 760 Special Topics in Thermal Engineering: Building Energy Performance ▪ ME 760 Special Topics in Thermal Engineering: Air Pollution and Greenhouse Gases ▪ ME 760 Special Topics in Thermal Engineering: Wind Energy	requirements for the Graduate Specialization are described below. 1. Graduate Specialization in Green Energy ○ To receive the Graduate Specialization in Green Energy, students must successfully complete 1 compulsory course and 3 elective courses: ▪ Compulsory course: ▪ ME 659 Energy and Environment ▪ Elective courses (choose 3 from the following list): ▪ ME 738 Special Topics in Materials: Hydrogen Storage Materials ▪ ME 751 Fuel Cell Technology ▪ ME 753 Solar Energy ▪ ME 760 Special Topics in Thermal Engineering: Low Energy Building Systems ▪ ME 760 Special Topics in Thermal Engineering: Building Energy Performance ▪ ME 760 Special Topics in Thermal Engineering: Air Pollution and Greenhouse Gases ▪ ME 760 Special Topics in Thermal Engineering: Wind Energy • **Graduate Studies Work Report** ○ Students must complete one or two work-term experiences. For each work experience, a work report must be submitted to the Department for review to earn credit for the work report. ○ Students are responsible for following the roles and responsibilities of Co-operative and Experiential Education (CEE).

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

Students currently enrolled in the MEng in MME program will not be impacted, as this will only be offered to students starting in Fall 2023.

Department/School approval date (mm/dd/yy): 02/02/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/01/23
Faculty approval date (mm/dd/yy): 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

CO-OPERATIVE AND EXPERIENTIAL EDUCATION
Co-operative Education
519-888-4026 | ceehub@uwaterloo.ca

Co-operative & Experiential Education (CEE)

Preliminary review

Proposed Program: Master of Engineering, Mechanical and Mechatronics Engineering, Co-operative Education

Program Effective Date: Fall 2023

Requested by: Cecile Devaud, Associate Chair for Graduate Studies, Department of Mechanical and Mechatronics Engineering

Prepared by: Richard Wikkerink, Director, Student & Faculty Relations, Co-operative Education – January 31, 2023

Executive Summary

The Department of Mechanical and Mechatronics Engineering has expressed intent to add a program-level work integrated learning (WIL) experience (co-op) option to their master's program for fall 2023. The co-op components of the degree will be fully administered by Co-operative & Experiential Education (CEE) with the work integrated learning (WIL) component included as a milestone degree requirement. The university has embarked on a Graduate Work Integrated Learning project with graduate co-op requirements and enhanced students support in scope. These new requirements and supports will come into effect in fall 2024.

The Graduate Diploma in Engineering Design has created an existing pattern for job opportunities and program support. Building on this, CEE will utilize existing staff, resources, and co-op processes across the portfolio to support this new program, as it does for other graduate co-op programs in Engineering. CEE will require sufficient time to complete a new program plan and will work with the program in the coming months to address system and records processing needs, WIL programming, and job development opportunities.

An industry and jobs analysis was not included in this report as there was insufficient advanced notice. We have included both an existing analysis (2020) of the Graduate Diploma in Engineering Design and added a summary analysis of undergraduate work terms in the 5th and 6th work term as a starting point. Analysis, completed by CEE, will follow in spring 2023 and encompass all new graduate co-op plans in the Faculty of Engineering.

With the understanding of a cap of 20 students for the 2023-2024 admission cycle (divided between fall, winter and spring) CEE supports in principle the proposed new

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MEng Mechanical and Mechatronics Co-op program and will collaborate with the academic unit on the development and administration of co-op components of the degree.

CEE recommends the Department of Mechanical and Mechatronics (Graduate Studies) consider the following:

- Establish new co-op admission requirements for Fall 2023 so that students may be directly admitted to the program, reducing barriers for international students who are required to obtain a co-op work permit to work in Canada
- Include co-op degree requirements in graduate calendar.
- The co-op sequence is designed to be flexible, within the framework that two terms of study must be completed prior to the first work term and the program ends on a study term
- Review the implications of involvement in co-op as related to items such as, but not limited to, student statuses, funding packages, and scholarships

CEE, with leadership from the designated Faculty Relations Manager, will:

- Complete a labour market and co-op job analysis for MEng programs, sharing this data with the grad job development working group to inform Account Management (AM) and Business Development (BD) activities and targets. The Senior Advisor working with Engineering and Mitacs is included in this group
- Collaborate with the Associate Chair Graduate Studies for Mechanical and Mechatronics Engineering and the Graduate Officer/Coordinator to work through the Co-op Program Plan and in 2024, align with new program requirements and student support model
- Together with the program determine success measures that link the MEng learning outcomes with criteria for co-op success that clarify the expectation for quality work terms

Work-Integrated Learning at UW

Co-operative Education is a form of work integrated learning (WIL), which allows students to apply classroom learning to the workplace and, likewise, connect workplace learning to their degree and areas of specialization. For those students who are seeking a stronger connection between their studies and industry, the University of Waterloo's co-op programs distinguish it amongst Canadian institutions. Furthermore, CEE provides a robust system of support for students (domestic and international visa) seeking work experiences in Canada or internationally.

Benefits go beyond the students. Industry partners benefit by gaining access to a wider range of grad students who bring varied experiences personally, professionally, and academically. All stakeholders will benefit from opportunities for idea exchange and strengthened connection between academic research and innovations in industry.

Introducing a new co-op plan aligns with the strategic focus on GradWIL at an institutional level and will continue to reinforce UW as a WIL leader for both undergraduate and graduate programs.

The key components of a quality WIL experience are pedagogy, experience, assessment and reflection, or P.E.A.R. Making sure all four elements are included in the development of program-level WIL are critical for creating a quality WIL experience.

- Pedagogy – includes the academic course content and the WIL curriculum
- Experience – meaningful and aligned appropriately with the WIL model
- Assessment – including the learning outcomes for the program + Future Ready Talent Framework
- Reflection – on the WIL experience and in alignment with the idea of "purposeful work"

Co-op Program Structure

The MEng Mechanical and Mechatronics Engineering Co-op program, as with other graduate co-op programs, will follow the existing co-op model. All co-op students are responsible for following the procedures, roles and responsibilities of co-op students.

Co-op students are strongly encouraged to complete PD 601 prior to their first co-op work term (typically completed in their Winter term/second study term) prior to the co-op experience and while they apply to jobs concurrently. PD 601 provides information on navigating the co-op employment process, foundational career preparation and teaches students how to prepare professional job search documents. Some graduate programs have positioned PD 601 as a foundational requirement for co-op participation. Students who have already completed similar UW co-op preparation modules (e.g.: PD1 Career

Fundamentals) will not be required to take PD 601. Note: PD 601 is currently going through a major re-development of course content, with an expected launch of Winter 2024.

The Centre for Career Action (CCA) provides career and co-op preparation resources and services (e.g.: resume, cover letter, interview preparation, job search, etc.) for all graduate students. These services are accessed more readily when promoted by the academic program or incorporated into existing courses. Additional collaboration between Mechanical and Mechatronics Engineering, SFR and CCA may be required prior to Fall 2023 to establish how existing services and staff will be utilized.

Co-op work terms must meet standard work term requirements for all graduate students. Mechanical and Mechatronics Engineering students will have access to the co-op job board through WaterlooWorks or may arrange their own employment, externally, which must be approved by CEE. During the experience, graduate students will be supported by Co-op Advisors through site visits, e-check-ins and work term ratings. Employers will evaluate the work performance of students via the Student Performance Evaluation (SPE); a rating of 'satisfactory' or above will grant the student credit for the work term.

To evaluate program effectiveness and WIL outcomes, the CEE Faculty Relations Manager, Engineering, will monitor key metrics annually to ensure program quality.

Master of Engineering Learning Outcomes

The program has indicated that the "success of the program related to co-op would be employment rate and quality of work term position relative to the learning outcomes of the program as well as at the level of a graduate student." Given that there are multiple factors contributing to the measure of quality (e.g., labour market, student experience, engagement, and readiness for the workplace), the department and CE will need to determine the criteria and process to assess the "quality of work term position."

The success of a co-op program can be measured through the learning that occurs on a work term thorough the Future Ready Talent Framework (FRTF) as assessed by the Student Performance Evaluation and the Major Reflective Report. The program may wish to consider mapping MEng learning outcomes and courses to the FRTF for further insight.

Co-op Sequence

Students in MEng Mechanical and Mechatronics Engineering will be required to complete one standard co-op work term following a minimum of two terms of study. CEE strongly recommends that students complete two consecutive co-op work terms in their program structure for a longer immersive work experience. This would meet needs for industry partners, builds on the current G.Dip model and be consistent with other

UW graduate co-op plans. Students will have the flexibility to select either term 3 or term 4 to do their work term, noting that all co-op programs must end on a study term to maximize the integration of classroom and workplace learning.

Co-op sequences will be determined with the program and student at the start of the first term of study, noting relevant deadlines as associated with the PD-601. In graduate programs, we are learning that early engagement in work-search strengthens the work term outcomes. As the program develops a pattern of work term sequences, there would be benefit (student expectations, job development, streamline process) in establishing a common sequence and managing individual modifications to sequences through sequence change processes.

Sample Sequence MEng Mechanical and Mechatronics Engineering Co-op with 2 work terms:

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Direct-entry Study	Study Co-op prep course (PD601)	**Work Term 1**	**Work Term 2**	Study Completion of Work Report	Study*
Direct entry Study	Study	Study Co-op prep course (PD601)	**Work Term** 1	**Work Term 2**	Study Completion of Work Report

Co-op Admissions

Programs seeking to add co-op as an option for their students are strongly encouraged to establish a direct-entry co-op program. There are a range of benefits to this structure, including CEE's ability to forecast earlier the number of students expected to be scheduled for a work term from the program and adjust employer and student-facing resources as necessary. Based on current process, visa students can be considered by Canadian immigration for a co-op work permit along with a student permit, preventing lengthy application processes when a work permit is applied for separately.

Beginning Fall 2023, students will apply and be directly admitted into the MEng Mechanical and Mechatronics Engineering Co-op plan. The academic unit will need to establish a specific process and criteria for admissions into this new program.

Where there is demand for co-op, consideration should be given to the value and intention of a WIL experience, as academic standing is not always an indicator of workplace success. Additionally, graduate students bring a range of personal, professional, and academic experiences and so while the more experienced students may ultimately be successful in finding co-op employment, they arguably may not be the students to benefit most from the WIL experience.

Degree Requirements

Graduate students completing the Co-operative education degree requirements will receive a "Co-operative Education" degree designation. These requirements include the following:

- Complete a minimum of one standard co-op work term and receive a Student Performance Evaluation of "marginal" or better
- Complete a work report/reflection requirement administered by the academic department

Note: as part of the GradWIL project, and in alignment with quality WIL standards, work is underway to enhance the graduate student co-op experience over the next two years. This includes the re-development of the co-op preparation course (PD 601) and the creation of a major reflective report post-experience. Graduate co-op programs should anticipate future calendar changes including additional co-op degree requirements for their students.

Graduate Student Support

The Centre for Career Action (CCA) is located in the Tatham Centre at the Waterloo campus and provides support to undergrad and grad students (whether in co-op or not), alumni and staff with co-op and career planning and preparation. Existing services include 1:1 appointments for resumes, cover letters, interview skills, work search, career planning and others, 1:1 drop-ins, workshops, both on and offline resources and supports all offered through a dedicated team of existing co-op and career staff.

Mechanical and Mechatronics Engineering graduate co-op students will be assigned to a team of Career Advisors who provide answers to co-op related questions as well as support throughout the co-op recruitment process. Once students secure a work term, they are offered additional support via a dedicated co-op Student Advisor who is available throughout the term, and provides a work term consultation and reviews e-check-ins.

Job Development

A more extensive Program Plan (feasibility study) will be completed in the Spring and will review the labour market, job demands, and areas for business development. With the newly established graduate job development working group in CEE, there is additional focus on strategies to develop jobs that are meaningful for the learning of graduate co-op students.

Building on the success of the co-op option in the Graduate Diploma in Engineering Design program, we feel that the typical lead time needed to develop jobs will be shortened. With strong connections into associated industries, CEE will actively develop a range of suitable opportunities for graduate students and monitor impact jobs available for senior undergraduate MME students.

As a course-based program with many pathways, marketing these students to employers may be challenging given the more specialized and focused areas of expertise and knowledge graduate students bring. Best efforts will be made to support graduate students in their job search – for example, CEE and Engineering have proactively been engaged with Mitacs and the funding they have access to for WIL at the graduate level. Existing services and expertise in CCA will be leveraged to support students in their job search, noting that the new program plan will examine the resources required to provide these supports.

Note: Given the evolving landscape of graduate co-op in the Faculty of Engineering, and in anticipation of more programs coming forward to include a co-op option, CEE will complete an industry and job analysis in Spring 2023. This report will consider all existing and new Master of Engineering co-op programs and will inform job development strategies for the growing numbers of students in these plans.

Additional Considerations
Graduate WIL

CEE and the GSPA, along with the faculties are undergoing a multi-unit, multi-year project to expand WIL offerings at the graduate level and enhance CEE co-op programming, support, and processes for graduate students. Therefore, graduate co-op will undergo several changes over the coming years which will impact existing programming, support, and job development efforts for graduate students.

Student Status and Fees

Graduate co-op students have their term status changed to co-op and pay a co-op fee during employed co-op work terms. Participation in graduate co-op may have implications for student statuses, funding packages and scholarships. The program will need to investigate further and make students aware of this.

International Students and Work Experiences

The CEE international team will support work terms held outside of Canada, adhering to UW and Global Affairs Canada (GAC) travel polices and advisories.

Students studying on a visa must obtain a co-op work permit in order to find employment for a co-op work term. Applying for a co-op work permit in Canada can take several months, with recent processing times taking at least six months. Direct admissions to the co-op program, allowing CEE to identify co-op students as early as possible, allows students to apply earlier and avoid delaying co-op employment.

Equity

Equity is an important component to consider within a competitive admissions and co-op process. For example, international students may encounter additional barriers such as: varying levels and types of work experience of incoming students, potential for travel restrictions, as well as the complexities of obtaining funding and/or security clearance that may be required for some roles can often be a disadvantage to international students and can delay or impact work term opportunities.

Co-op Program Plan

Following all levels of academic program approval for this new program and before the first term of admission, a Co-op Program Plan will be required. The Co-op Program Plan is a checklist of information, records, system, communications, etc., that ensure CEE administered co-op plans are set-up appropriately and necessary decisions are made. This is a collaborative activity led by a designated Faculty Relations Manager and the academic unit.

Overview of core data from the MME UG program:
MME Graduate students have different experiences and skills than UG students and job competition between UG and Graduate students will be present but mitigated by business development strategies to market the graduate student skill set to industry partners. A more complete analysis will be completed by the end of May 2023.

1. Spring work terms have the highest number of senior students scheduled out (figure 1)
2. Analysis of employers (figure 2) that hire senior UG students demonstrates a wide array of employers, with a balance of a few large employers and many employers who regularly hire smaller numbers of students
3. The main co-op job board provides employment for the majority of senior UG MME students – there is a healthy balance of students who return to a former employer and those who arrange their own job. We have noted that many employers in the AOJ have connections to the UW Co-op program.

Figure 1

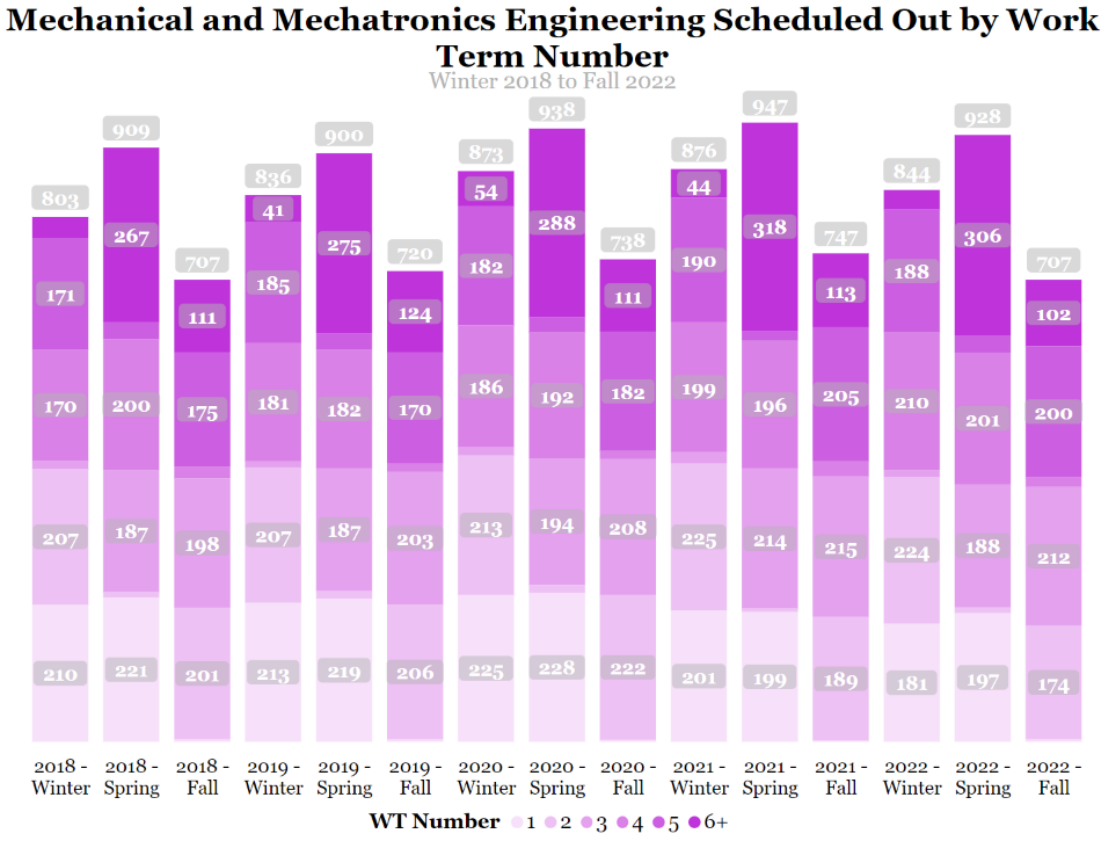


Figure 2

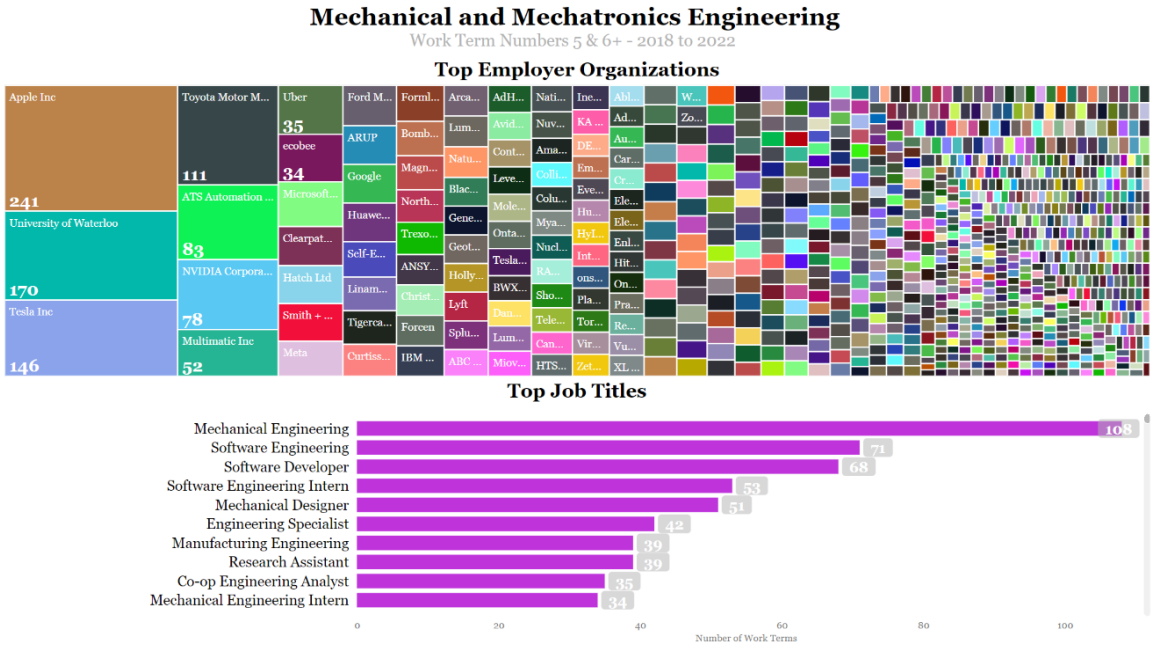
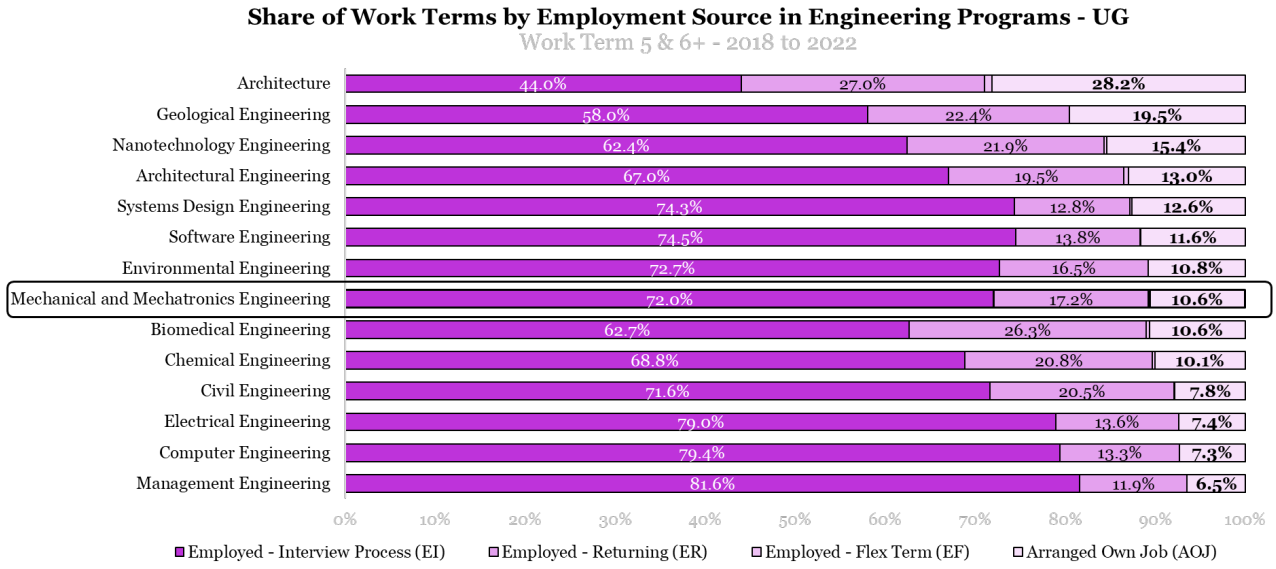


Figure 3



Program Review for Graduate Diploma in Engineering Design

Time period: January 2017 – December 2020

Prepared by: Phil Bezaire, Faculty Relations Manager – Engineering, Co-operative Education, University of Waterloo

Executive Summary

In 2017, the Mechanical and Mechatronics Engineering Graduate Diploma in Engineering Design (GDip) introduced an integrated, co-operative education option to eligible students. This report outlines four years of data, from 2017-2020, representing GDip students' experiences throughout co-op recruitment and employment.

Employment Trends

The GDip program has seen relatively steady enrolment in co-op over the review period, excepting one unusually large cohort in 2018. During this time, GDip has maintained employment rates of 100% in every year except 2020, in which job prospects were significantly depressed due to the global COVID-19 pandemic. GDip students are employed in a variety of organizations and roles, signifying the broad appeal and skillsets that students bring to their co-op work terms. It is noted, however, that nearly half of positions are within the manufacturing sector alone; diversification of jobs across multiple industries could help ensure continued stability of employment prospects.

Student Performance and Satisfaction

GDip students students receive very high performance ratings from their employers, although they score somewhat fewer 'Outstanding' work term evaluations when compared to other Engineering programs. GDip students report a very high level of overall satisfaction with their experience, exceeding Faculty averages across all Rate My Work Term indices. Further investigation may help reveal the primary drivers of student satisfaction, which in turn may enable the development of strategies to improve satisfaction across all programs.

Academic Integration

With regards to program integration, it is critical that students see individual program staff and faculty members as co-op champions. Demonstrating an understanding of the process/timing for co-op recruitment activities, awareness of the time commitment required as well as helping students draw out their strengths and relevant skills are significant drivers in enhancing student experience and success. Moving forward, Co-operative Education will be actively working on deepening engagement with students, and hopes to partner with departments in encouraging their students to connect their workplace experiences and talent development to course-based learning. Supporting students in bringing their workplace learning into their courses, and their course-based learning into their work terms, is a fundamental aspect of strengthening our co-op programs at the University of Waterloo.

Co-operative Education will continue to work with the Mechanical & Mechatronics Engineering department to support GDip students in attaining and excelling in rewarding work experiences

throughout their studies at the University of Waterloo. Co-operative Education continues to seek student feedback and find opportunities to engage students throughout their co-op experience.

Co-operative Education at UW

Co-operative education is an educational model that formally integrates academic studies with relevant work experience. Co-op students alternate terms of school with terms of paid employment in relevant fields; 4-months of study followed by 4-months of work.

Academic learning is shared/applied on the job and work experience is shared/applied in the classroom. Genuine work experience in and of itself provides workplace and professional skills and knowledge development that is different from, yet complementary to, that learned from the academic learning experience.

Graduate co-op students complete up to eight months of work experience which better positions students for their transition to either full-time employment, or further post-secondary pursuits. The co-op model allows students opportunity to test-drive and determine their best career fit as they progress throughout their undergraduate or graduate degree.

University of Waterloo's (UW) Advantage:

- **Largest** in the world >> 22,000+ students in more than 120 programs of study
- **World class** experience >> students work in nearly 60 countries
- **Competitive** employment process >> not a 'placement'
- **Mandatory career preparation** programs >> 10+ job-skill development courses
- **Performance evaluation** at the conclusion of each job >> high incentive to perform well
- **Critical thinking** >> written work reports explore links between academic study and the workplace

Co-op Employment Process

Waterloo's co-op employment process is highly competitive; students apply for jobs they feel suit their skills and interests and then participate in an open interview process when selected by an employer.

Students and employers rank one another based on preference and a computer algorithm matches students to jobs.

Students are also encouraged to pursue their own employment and career interests, and are frequently able to turn these opportunities into credit-worthy co-op work terms.

Value to Employers:

- Hire with flexibility
- Fill immediate needs quickly
- Talent management strategy to find full time employees after graduation
- Low risk and cost-effective hiring
- Contribute to building country's talent pool

Employer Commitment:

- Provide students with worthwhile work
- Pay students
- Provide effective supervision, coaching and evaluation
- Participate in the employment process with integrity
- Promote co-op within company and to other employers

Value to Students:

- Enhance learning
- Evaluate career options
- Accumulate up to 2 years work experience
- Help finance education
- Build a network of professional contacts

Student Commitment:

- Balance the job search with academics
- Pay a co-op fee
- Meet employer expectations
- Respond to the demands of the work force
- Participate with integrity

Value to Institution:

- Makes the institution more attractive and affordable to students
- Attracts highly motivated students
- Drives more relevant curriculum
- Facilitates transfer of knowledge between the workplace and the classroom
- Builds a network of business and industry contacts that may be leveraged in areas such as research, development and advancement

Institution Commitment:

- Resources (cost and talent)
- Provide academic credit for work experience
- Value work experience in the classroom
- Hire students
- Teach classes year-round to accommodate work terms
- Promote to business, government, etc.

Program Background

The Graduate Diploma in Engineering Design (GDip) launched a co-op option in 2017, enabling eligible students to participate in a co-op work term. This option helped to formalize existing work-integrated learning experiences that had been a part of the GDip since its inception, while expanding student access to the Co-operative Education employer base.

Co-op Requirements

In parallel with completing co-op work terms, co-op plans have additional degree requirements to enhance work-integrated learning. Specifically, GDip students must also complete a work term report / case study as part of their co-op experience. This requirement is considered academic in

nature; responsibility for outlining criteria and tracking successful completion rests with the Mechanical and Mechatronics Engineering department.

While work reports may take many forms, they give students the opportunity to reflect on the connection between their academic studies and their work experiences. These reports should demonstrate evidence of critical analysis, good organization, clarity, and conciseness. In preparing work reports, students are able to work on presentation skills, forming arguments, developing and applying evaluation criteria, and performing quantitative analysis, and in the process, create a permanent record of their work. Well-researched, organized, and documented work reports will have a positive impact on students' careers.

Academic/Work Term Sequencing

The GDip program offers a single work term, most commonly completed during the Spring term. In some cases, however, students are permitted to complete their work term in the Winter, as shown below. In rare cases, students can be given special permission to extend an arranged work term into a second semester so to complete 8 months of work consecutively, but such cases are considered exceptional and require approval from both Co-operative Education and the GDip program.

Plan	Year One			Year Two		
	Fall	Winter	Spring	Fall	Winter	Spring
GDip – ENG Design Stream 4	Academic Term	**Work Term**	Academic Term	Academic Term	-	-
GDip – ENG Design Stream 8	Academic Term	Academic Term	**Work Term**	Academic Term	-	-

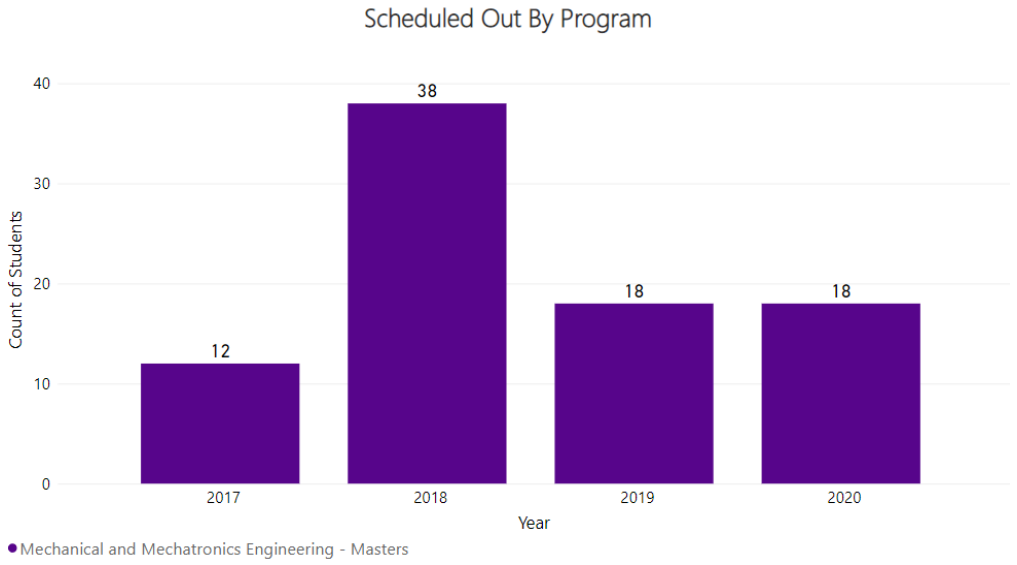
Salary Information

Figures in the table below represent the hourly earnings reported by co-op students on work terms for the Faculty of Engineering in 2019, including all undergraduate and graduate programs. Typically graduate co-op students earn a salary aligning with more senior undergraduate experiences, consistent with Work Terms 4 – 6 in the table below. Co-operative Education does not establish or recommend pay level for co-op students.

Engineering	Work Term 1	Work Term 2	Work Term 3	Work Term 4	Work Term 5	Work Term 6
Average	$17.62	$19.66	$21.16	$22.83	$24.13	$25.02
Range	$14.00 - $27.00	$14.00 - $33.00	$14.00 - $34.00	$14.00 - $35.00	$14.00 - $38.00	$14.00 - $38.00

Students Scheduled Out for Co-op Work Terms

The number of GDip students scheduled out has been relatively consistent, excepting a significantly larger cohort in 2018. Enrolment into the co-op option is managed exclusively by the GDip program, and a variety of factors can impact co-op participation, including applicant quality, the job market, internal enrolment limits, or even co-op success. It is noted that co-op students who are unsuccessful in securing employment on a scheduled work term may choose to revert to the regular, or non-co-op program option; doing so would remove them from scheduled out counts.



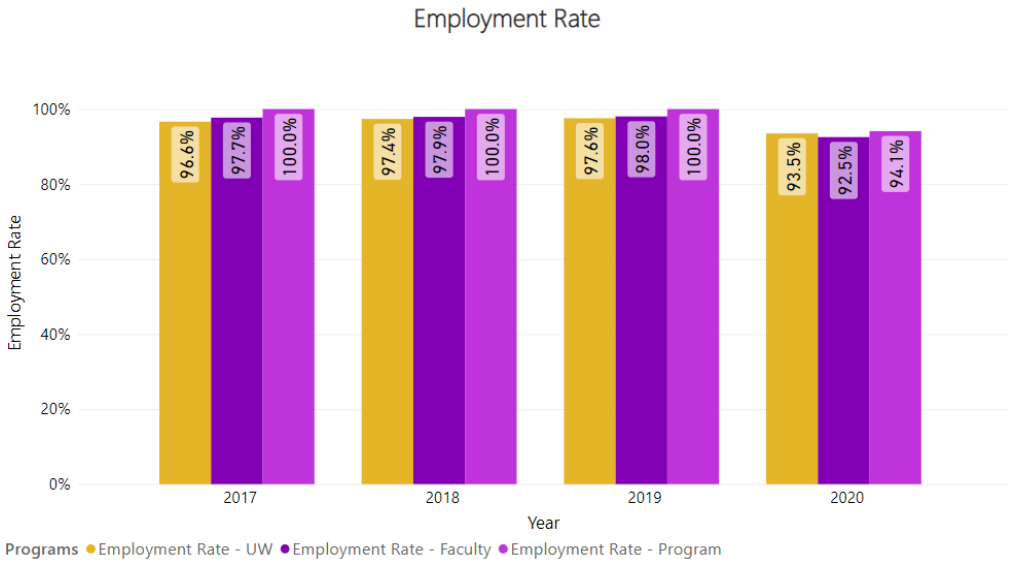
Employment Overview

Many factors influence employment rates, including:

- Availability of suitable employment opportunities (e.g., economic pressures, number of students enrolled versus number of job openings, employer recruitment strategies, etc.);
- Active engagement by students in the application process;
- Experience of students seeking employment (e.g., graduate students may, or may not have prior professional experience);
- Realistic pursuit of available openings (i.e., students apply to jobs for which they have the appropriate skill sets); and/or,
- Flexible pursuit of available openings (i.e. students submit their applications to a geographically diverse and varied set of employers to capitalize on every available opportunity).

Program Employment Rates

The following graph illustrates the yearly employment rates for students in the GDip program, Faculty of Engineering, and UW students over the past 4 years. During this period GDip averaged an employment rate of 98.8% while the Faculty of Engineering averaged an employment rate of 96.4%. Even in the early stages of the COVID-19 pandemic in 2020, GDip students were successful in finding employment at a higher rate than average.



Employment Rates/Methods Commentary

The following graph illustrates a different way of observing the various employment methods students may use to secure employment:

- EI = Employed - Interview Process (secured employment through the campus co-op recruitment process)
- EJ = Employed - Jointly Arranged (secured employment externally with the assistance of Co-operative Education)
- ER = Employed - Returning to Previous Employer (returned to a previous co-op employer)
- ES = Employed - Student Arranged (secured employment externally without the assistance of Co-operative Education)
- UI = Unemployed - Interview Process (did not secure employment via the campus recruitment process)

Students most often prefer to seek and secure employment via the facilitated process in WaterlooWorks (EI). It is structured, fits their academic timeline and is managed almost entirely on-campus whenever possible.

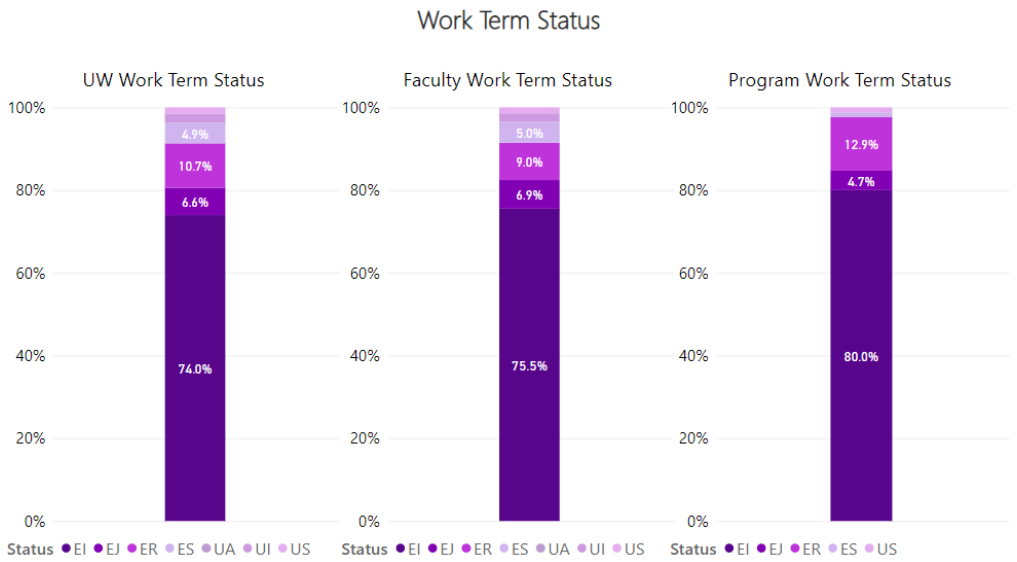
Returning to a previous employer (ER) is another desired outcome and a valuable experience for students. Undertaking additional work terms with the same employer (either sequentially or back-to-back) often provides enhanced responsibility, more robust work and heightened levels of awareness of the context in which the work is being completed.

Arranging one's own employment (ES) is an equally valuable activity; although, it can be time consuming. This kind of activity is often undertaken very early in the term (before the main match commences) or much later in the term when students seek to expand the number of opportunities available to them outside of the facilitated process.

While every effort is made to develop as many jobs as possible for all UW co-op students, and assistance is provided to help them be successful regardless of the method they use to secure their employment, 100% employment is not achieved every term (UI).

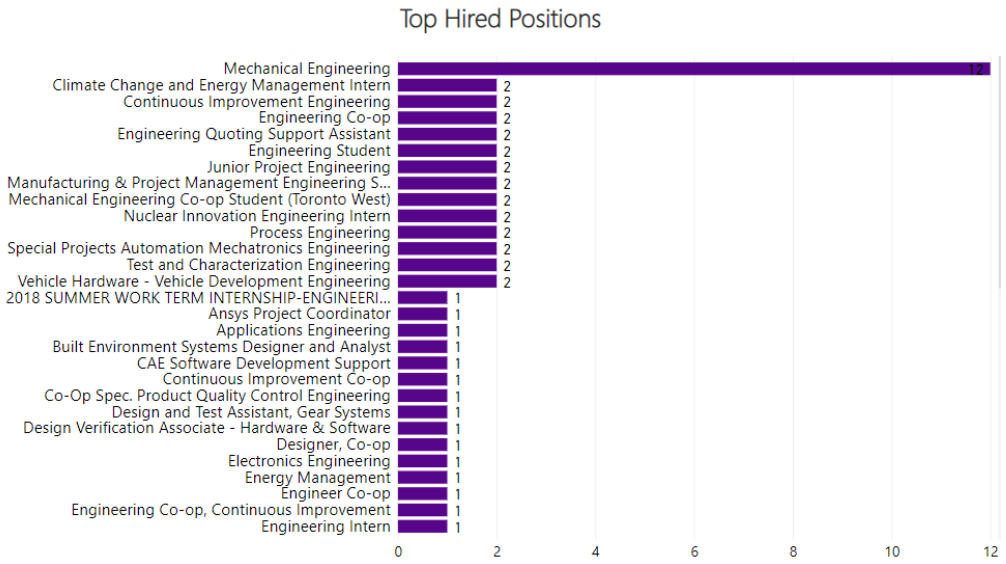
Program Work Term Statuses

The following graph illustrates the average distribution of work terms statuses for the GDip, Faculty of Engineering, and UW students over the past 4 years. Over this time, GDip students have secured work terms through our facilitated interview process (EI) at a higher rate than the Faculty and University of Waterloo averages, suggesting a high degree of success in competing for posted jobs.



The following graph illustrates the most common employers of GDip students over the past 4 years. As a small program with relatively low enrolment, most employers have only hired one or two GDip students. This lack of dependency on a single employer is encouraging, and suggests overall success in obtaining employment across a variety of employers. It should be noted, however, that one exception, Concord Screen, stands out, having employed 8 GDip students since Spring 2018, representing 9.5% of all GDip co-op positions.

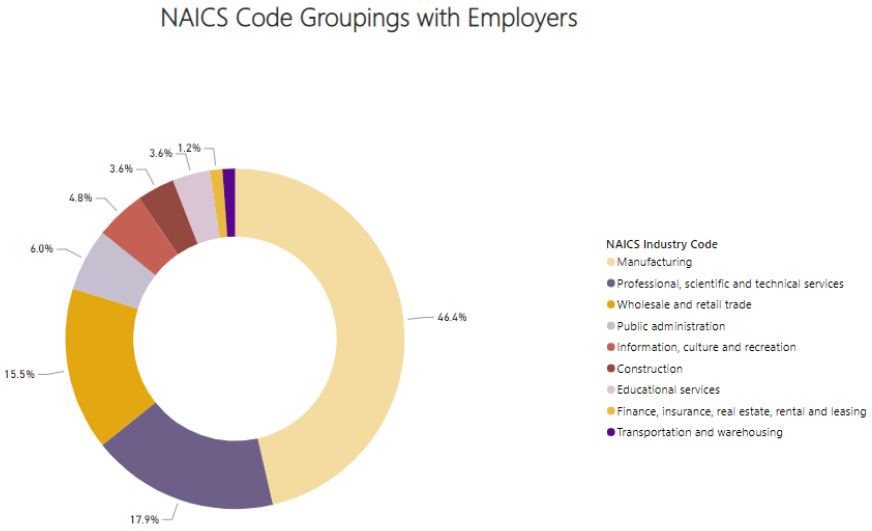
The following graph depicts most common positions held by GDip students over the course of the last 4 years. Unsurprisingly, the most common job title was simply 'Mechanical Engineering' with variations of 'Engineering Co-op' and 'Engineering Student' also appearing. Having said that, other position titles with greater role specificity reveal a diverse array of positions, with roles related to Climate Change and Energy Management, Continuous Improvement, Vehicle Hardware, Electronics, Nuclear Innovation, among many others.



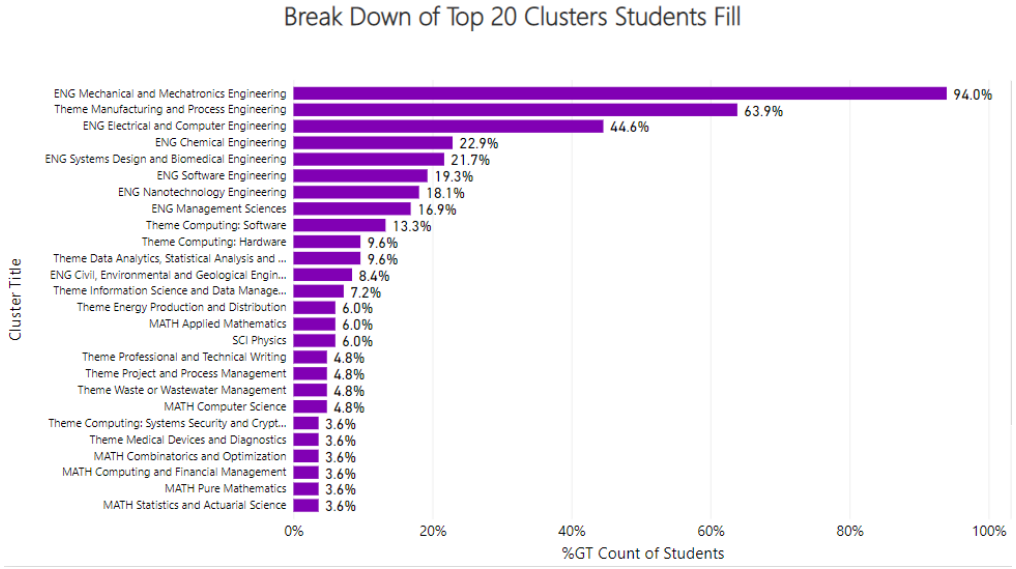
Work Terms by Industry

The following graph illustrates the distribution of NAICS code groupings for positons held by GDip students over the past 4 years. GDip work terms are predominantly focused within three NAICS code groupings: 'Manufacturing' (46.4%), 'Professional, Scientific, & Technical Services' (17.9%), and 'Wholesale and Retail Trade' (15.5%). These industries and distributions vary significantly from the

broader Faculty of Engineering averages; by comparison, the top three industries for the Faculty are Professional, Scientific, & Technical Services (30.2%), Manufacturing (22.5%), and Information, Culture and Recreation (9.9%).

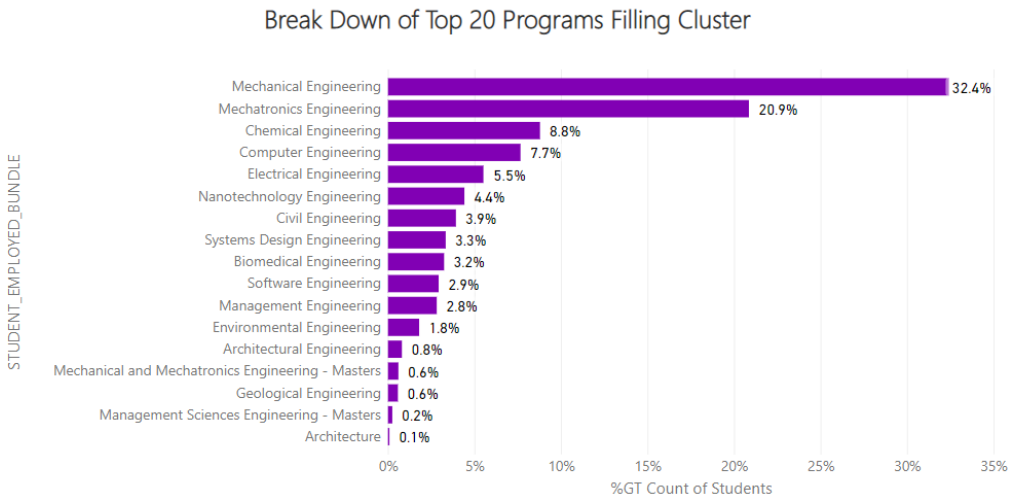


In WaterlooWorks, job postings are clustered in terms of relevance to various academic themes and programs. The following graph illustrates the top clusters assigned to the jobs filled by GDip students. Unsurprisingly the general academic cluster of 'ENG Mechanical and Mechatronics Engineering' was the most commonly assigned; this cluster acts as an umbrella for any employers seeking to hire students in the department, whether undergraduate or graduate. The thematic cluster associated with Manufacturing and Process Engineering was also quite prevalent, consistent with the industry classifications shown above.



Note: Job clustering capabilities were introduced in Winter 2017 when WaterlooWorks replaced JobMine as the University of Waterloo's online recruiting system. Co-operative Education is continuing to review cluster data (thematic and program clusters) and will develop a process to review programs included in clusters.

The following graph illustrates the Engineering programs of students that filled jobs assigned to the 'ENG Mechanical and Mechatronics' cluster since 2017. As expected for a small program, GDip students fill a relatively small proportion of the jobs associated with this cluster, as it also serves the much larger undergraduate population. Success in securing employment despite such competition, however, speaks to the quality and appeal of GDip students. It is noteworthy, however, that jobs can be assigned multiple clusters. Anecdotal evidence suggests that many of the jobs filled by students in other programs were also clustered to those students.

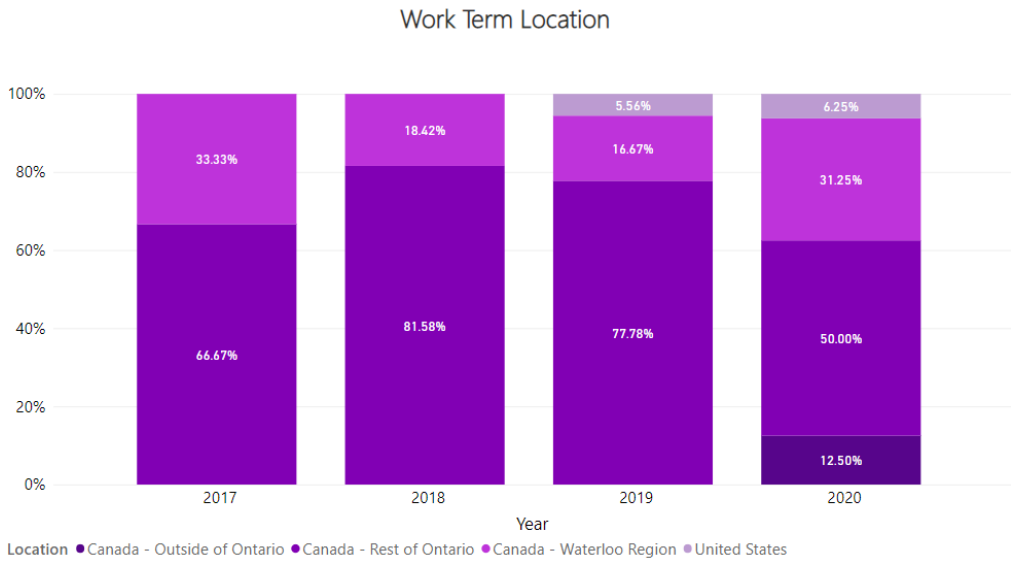


Unpaid Work Terms

It is a requirement of co-op work terms for students to be compensated. There are occasions when students do not receive a traditional salary but do receive some form of alternative remuneration. This may be an honorarium, or stipend, paid travel expenses, housing etc. Unpaid positions that are undertaken by these students are commonly with early-stage start-ups, where there is unavailable financial capital to support co-op hiring. GDip students, however, have not undertaken any unpaid work terms since the co-op option was introduced in 2017.

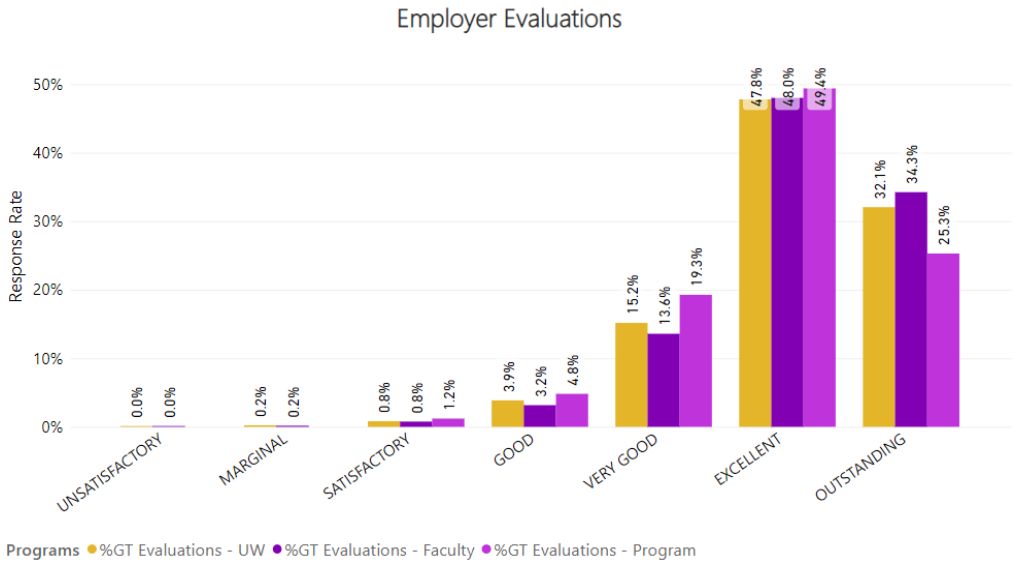
Location of Work Terms

As shown in the following chart, approximately 81% of GDip work terms took place in the Province of Ontario in 2020, 31% of which were in the Waterloo Region. Only 6% of work terms took place outside of Canada, compared to approximately 14% across the Faculty. This may be the result of a lack of awareness or understanding of the program amongst international employers, or perhaps that students are specifically seeking Canadian experience.



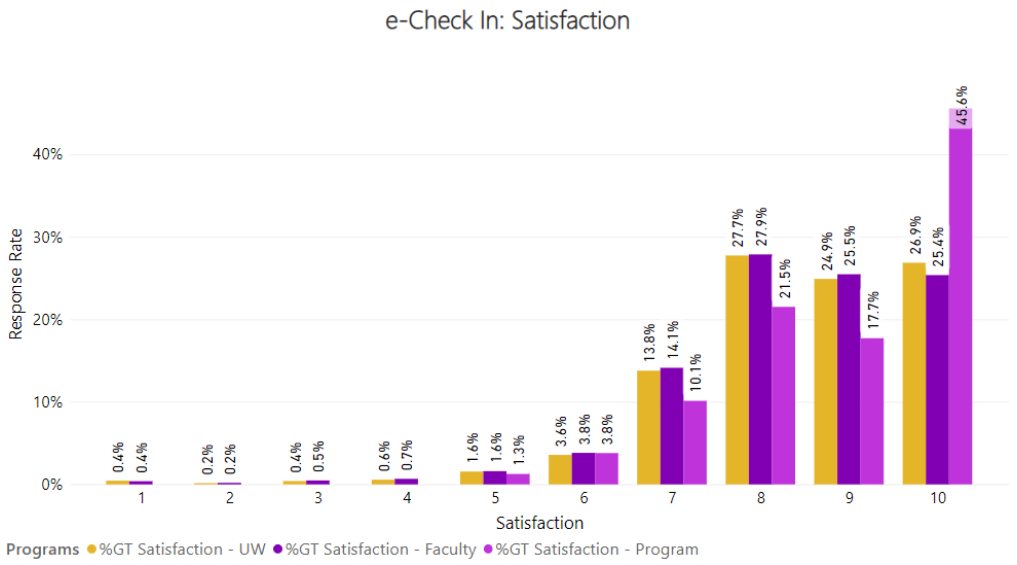
Employer Evaluations of Students

The following graph illustrates the distribution of employer evaluations of GDip, Faculty of Engineering, and UW students over the past 4 years. GDip students achieved consistently high results, though in general received less 'Outstanding' evaluations (25.3%) than the Faculty and University averages. While this may point to marginally lower employer satisfaction, it should be emphasized that evaluation results remain exceedingly high. In addition, it may also be possible that employer expectations may be different for GDip students, particularly given the different distribution of industries in which they work, and their graduate student status.



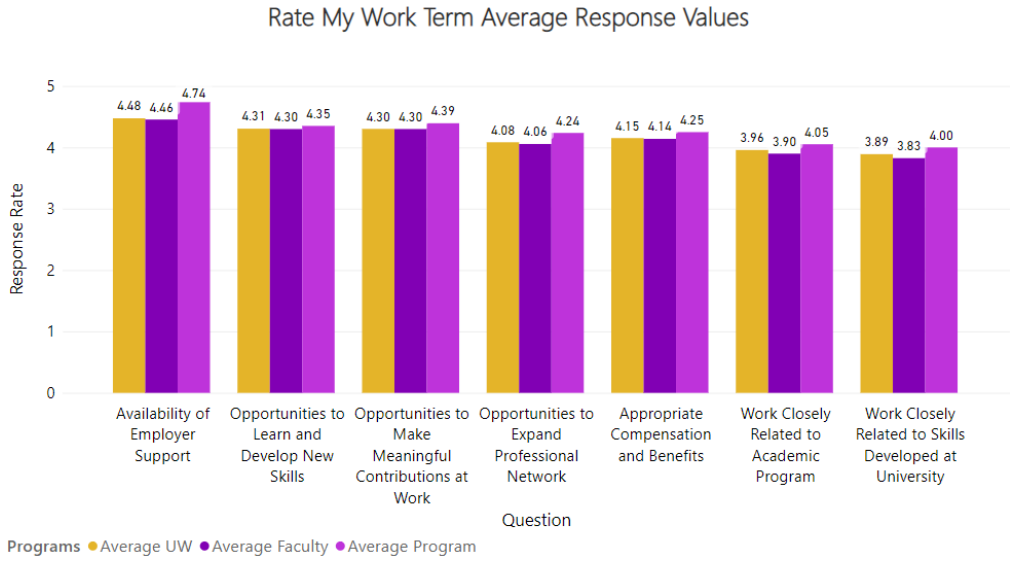
Student Evaluations of Work Experience

The following graph illustrates the distribution of student evaluations of work term satisfaction given by GDip, Faculty of Engineering, and UW students over the past 4 years. On average, GDip students tended to be notably more satisfied with their co-op work terms than both Faculty of Engineering and UW students, with nearly 46% of students rating their satisfaction at '10'.



Rate My Work Term Survey Results

The following graph illustrates the average rating of each Rate My Work Term (RMWT) evaluation category for GDip, Faculty of Engineering, and UW students. Each question is designed to assess the student's satisfaction with a different aspect of their work term experience. GDip students indicated higher satisfaction than Faculty and UW average responses in every RMWT category.



Co-op and Career Preparation

The Centre for Career Action's (CCA) vision aligns with that of the Co-operative and Experiential Education portfolio within which it sits: to connect imagination with impact for a better world through global leadership in co-operative and career education, experiential and work-integrated learning.

CCA supports all Waterloo students (regular and co-op, undergraduate and graduate), alumni and employees. Its mission is to educate and inspire all these learners to develop and take action to achieve current and future career goals. CCA accomplishes this through high quality in-person and on-line career education services addressing: career management strategies, graduate and professional school preparation, and effective work search strategies and tactics. Offerings include appointments, workshops/webinars, events, drop-in sessions and CCA's large on-line resource, CareerHub. The continuous improvement mindset held within CCA enables it to maintain its relevance to learners seeking support to identify and articulate their skills, find and create meaningful work and lifelong learning experiences, and ultimately build their resilience to navigate the ever-changing labour market.

In addition, Career Advisors in CCA act as the first point-of-contact/support for pre-first work term co-op students. These services include providing strategically-timed, proactive and hope-centred outreach, as well as highly responsive drop-in co-op consults. CCA is also the author of the Career Fundamentals (COOP 601) course made available to GDip students during their recruitment term.

Graduate Studies
Program Revision Template

This item for consideration on SGRC Regular Agenda

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

Faculty: Engineering

Programs: 1) Graduate Diploma (GDip) in Design Engineering

2) Graduate Diploma (GDip) in Design Engineering - Co-operative Program

Program contact name(s): Cecile Devaud

Form completed by: Cecile Devaud

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Discontinuing the Type 2 GDip in Design Engineering and the Type 2 GDip in Design Engineering - Co-operative Program.

Is this a major modification to the program? Yes

Rationale for change(s):

The GDip in Design Engineering and GDip in Design Engineering - Co-operative Program have relied on the availability of one faculty member with unique expertise in design, responsible for selecting students and teaching the three core courses (ME 680, ME 681 and ME 682). This faculty member is retiring in July 2023. The Department of Mechanical and Mechatronics Engineering does not have adequate teaching resources to continue the GDip in the same mode of operation and there is no plan in the short-term of hiring a new faculty member capable of teaching ME 680, ME 681 and ME 682 on a regular basis.
Further, the Department of Mechanical and Mechatronics Engineering is in the process of restructuring its MEng program with new graduate specializations and a direct entry co-op option that will offer alternatives to applicants interested in mechanical and mechatronics engineering MEng and co-op.

Proposed effective date: Term: Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-mechanical-and-mechatronics-engineering/graduate-diploma-gdip-design-engineering

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-mechanical-and-mechatronics-engineering/graduate-diploma-gdip-design-engineering-co-operative-program

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

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~**GRADUATE DIPLOMA (GDIP) IN DESIGN ENGINEERING**~~ ~~**Program information**~~ ~~• Delivery mode~~ ~~○ On-campus~~ ~~• Program type~~ ~~○ Diploma~~ ~~• Study option(s)~~ ~~○ Coursework~~ ~~**Admission requirements**~~ ~~• Minimum requirements~~ ~~○ Students in the Master of Engineering (MEng) in Mechanical and Mechatronics Engineering program may complete the requirements for the GDip in Design Engineering in conjunction with their MEng requirements.~~ ~~**Degree requirements**~~ ~~Coursework option:~~ ~~• Courses~~ ~~○ Students must complete the following courses:~~ ~~○ Mandatory courses:~~ ~~▪ ME 680 Advanced Design Engineering~~ ~~▪ ME 681 Advanced Design Engineering - Design Project 1~~ ~~▪ ME 682 Advanced Design Engineering - Design Project 2~~ ~~○ Specific courses: 1 from the following list:~~ ~~▪ ME 538 Welding Design, Fabrication and Quality Control~~ ~~▪ ME 555 Computer-Aided Design~~ ~~▪ ME 559 Finite Element Methods~~ ~~▪ ME 561 Fluid Power Control Systems~~ ~~▪ ME 566 Computational Fluid Dynamics for Engineering Design~~ ~~○ General courses: 4 additional Faculty of Engineering graduate courses (subject to the approval of the Department).~~	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~○ All courses are 600 and 700 level courses and students are not allowed to take more than 2 500 level courses (courses open to both undergraduates and graduates) out of their 8 required courses.~~ **~~GRADUATE DIPLOMA (GDIP) IN DESIGN ENGINEERING - CO-OPERATIVE PROGRAM~~** **~~Program information~~** ~~• Delivery mode~~ ~~○ On-campus~~ ~~• Length of program~~ ~~○ Students enrolled in this diploma option are granted one additional term to complete the requirements set by the Master of Engineering (MEng) in Mechanical and Mechatronics Engineering program:~~ ~~▪ Full-time: 5 terms (20 months)~~ ~~▪ Part-time: 10 terms (40 months)~~ ~~• Program type~~ ~~○ Co-operative~~ ~~○ Diploma~~ ~~• Study option(s)~~ ~~○ Coursework~~ **~~Admission requirements~~** ~~• Minimum requirements~~ ~~○ Students in the Master of Engineering (MEng) in Mechanical and Mechatronics Engineering program may complete the requirements for the GDip in Design Engineering - Co-operative Program in conjunction with their MEng requirements.~~ ~~○ Qualified students interested in the co-op option must submit an application by August 1st for 4-stream and by December 1st for the 8-stream and meet the following requirements:~~ ~~▪ Students will be interviewed by the Department before they are recommended to Co-operative and Experiential Education (CEE) for approval. Interviews will take place prior to the end of August or December for 4-~~	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~stream and 8-stream options, respectively.~~ ~~▪ Students should submit the following with their application and prior to their interviews:~~ ~~▪ a. any previous Professional Engineering Licensure documents or licensure status~~ ~~▪ b. design portfolio (past design project experiences including capstone projects....)~~ ~~▪ An excellent command of the English language.~~ **~~Degree requirements~~** ~~Coursework option:~~ ~~• Courses~~ ~~○ Students must complete the following courses:~~ ~~○ Mandatory courses:~~ ~~▪ ME 680 Advanced Design Engineering~~ ~~▪ ME 681 Advanced Design Engineering - Design Project 1~~ ~~▪ ME 682 Advanced Design Engineering - Design Project 2~~ ~~○ Specific courses: 1 from the following list:~~ ~~▪ ME 538 Welding Design, Fabrication and Quality Control~~ ~~▪ ME 555 Computer-Aided Design~~ ~~▪ ME 559 Finite Element Methods~~ ~~▪ ME 561 Fluid Power Control Systems~~ ~~▪ ME 566 Computational Fluid Dynamics for Engineering Design~~ ~~○ General courses: 4 additional Faculty of Engineering graduate courses (subject to the approval of the Department).~~ ~~○ All courses are 600 and 700 level courses and students are not allowed to take more than 2 500 level courses (courses open to both undergraduates and graduates) out of their 8 required courses.~~	

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
~~• Graduate Studies Work Report~~	

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

Students currently pursuing the GDips will not be impacted by the changes. In Fall 2023 and Winter 2024, ME 681 and ME 682, which are project-based courses, will be offered to existing GDip students to complete their degree.

Department/School approval date (mm/dd/yy): 02/02/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/01/23
Faculty approval date (mm/dd/yy): 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Engineering & Science

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: NANO

Course number: 701

Course ID: 013600

Course title (max. 100 characters including spaces): Fundamentals of Nanotechnology

Course short title (max. 30 characters including spaces):

Grading basis: Choose an item.

Course credit weight: Choose an item.

Course consent required: Choose an item.

Course description:

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

Primary meet type: Choose an item.

Delivery mode: Choose an item.

Requisites:

Special topics course: Yes ☐ No ☐

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

NANO 701 Fundamentals of Nanotechnology and the topics listed under this course, will no longer be offered. NANO 701/702 have been replaced by regularly scheduled (0.50 unit weight) 600 level courses.

The content of the NANO 701/702 courses that are being inactivated, has been incorporated into the new 600 level courses. The 600 level courses for the Collaborative Nanotechnology Program were approved by SGRC in February 2021.

Form completed by:
Department/School approval date (12/05/22):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/04/22
Faculty approval date (mm/dd/yy): SFC 03/14/23; EFC 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Engineering & Science

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: NANO

Course number: 702

Course ID: 013601

Course title (max. 100 characters including spaces): Nanotechnology Tools

Course short title (max. 30 characters including spaces):

Grading basis: Choose an item.

Course credit weight: Choose an item.

Course consent required: Choose an item.

Course description:

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

Primary meet type: Choose an item.

Delivery mode: Choose an item.

Requisites:

Special topics course: Yes ☐ No ☐

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

NANO 702 Nanotechnology Tools and the topics listed under this course, will no longer be offered. NANO 701/702 have been replaced by regularly scheduled (0.50 unit weight) 600 level courses.

The content of the NANO 701/702 courses that are being inactivated, has been incorporated into the new 600 level courses. The 600 level courses for the Collaborative Nanotechnology Program were approved by SGRC in February 2021.

Form completed by:
Department/School approval date (12/05/22):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/04/22
Faculty approval date (mm/dd/yy): SFC 03/14/23; EFC 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Engineering and Science

Effective date: Term: Fall Year: 2024

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: NANO

Course number: 707

Course ID:

Course title (max. 100 characters including spaces): From Atoms to Crystals, Quantum Wells, Wires and Dots

Course short title (max. 30 characters including spaces): Atms 2Crstls Qntmwels Wirsdots

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Atomic Structure and Interatomic Bonding; the structure of crystalline solids; imperfections in solids; elements of quantum theory of solids for nanostructures; elements of thermodynamics and kinetics for crystal growth; bulk crystal growth; epitaxial technologies; role of stress and strain in epitaxial structure; low-dimensional structures, growth mechanisms and related challenges. The unique properties of nanostructured

materials will be highlighted.

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Anti-requisites: NANO 701 Topic 02 (Solid State Physics & Chemistry) and Topic 14 (From Atoms to Crystals)

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

NANO 701 and 702 topic courses are being inactivated due to the approval of regularly offered NANO 600 level courses. The proposed NANO 707 course combines the content of NANO 701 topics 02 and 14. Dedicated NANO core course modules will be more advantageous when delivered as full-term, 0.50 credit weight courses.

Form completed by: Annette Dietrich
Department/School approval date (12/05/22):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 09/12/22
Faculty approval date (mm/dd/yy): SFC 03/14/23; EFC 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies
Program Revision Template

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

Faculty: Engineering & Science

Program: Collaborative Programs in Nanotechnology:

1) Master of Applied Science (MASc) in Chemical Engineering - Nanotechnology

2) Doctor of Philosophy (PhD) in Chemical Engineering - Nanotechnology

3) Master of Applied Science (MASc) in Electrical and Computer Engineering - Nanotechnology

4) Doctor of Philosophy (PhD) in Electrical and Computer Engineering - Nanotechnology

5) Master of Applied Science (MASc) in Mechanical and Mechatronics Engineering - Nanotechnology

6) Doctor of Philosophy (PhD) in Mechanical and Mechatronics Engineering - Nanotechnology

7) Master of Applied Science (MASc) in Systems Design Engineering - Nanotechnology

8) Doctor of Philosophy (PhD) in Systems Design Engineering - Nanotechnology

9) Master of Science (MSc) in Chemistry - Nanotechnology

10) Doctor of Philosophy (PhD) in Chemistry - Nanotechnology

11) Master of Science (MSc) in Physics - Nanotechnolog+B2y

12) Doctor of Philosophy (PhD) in Physics - Nanotechnology

Program contact name(s): Mustafa Yavuz, Program Director | Annette Dietrich, Administrative Coordinator

Form completed by: Annette Dietrich

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Adding NANO 707 to the list of Nanotechnology core courses, which are a component of the Nanotechnology collaborative program.

NANO 707 will be a full-term 0.50-credit course that will replace one set of the previously required NANO 701/NANO 702 half-term, 0.25-credit core course modules (specifically, NANO 701 Topic 02 (Solid State Physics & Chemistry) and Topic 14 (From Atoms to Crystals)). Note: NANO 701/NANO 702 are also being inactivated.

Is this a major modification to the program? No

Rationale for change(s):

1. *To provide all nanotechnology students with consistent offerings of regular, full-term, 0.50 credit courses.*
2. *To enable instructors to teach consistent regular courses.*

3.To enable assignment of anti-requisites to the core course offerings, making it possible to prevent students who have taken NANO 701/702 courses from taking courses that duplicate material.

4.To eliminate the problems associated with students attending only six weeks of a combined, full-term NANO 701/702 or held-with course, including disrupting students attending the full course and requiring the professor to spend time catching up new students who arrived mid-way through the full-term course.

Proposed effective date: Term: Fall Year: 2024

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-chemical-engineering/master-applied-science-masc-chemical-engineering-nanotechnology

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

Degree requirements
• **Courses**
  ○ Nanotechnology core courses:
  ▪ NANO 601 Characterization of Nanomaterials
  ▪ NANO 602 Structure and Spectroscopy of Nanoscale Materials
  ▪ NANO 603 Nanocomposites
  ▪ NANO 604 Nanomechanics and Molecular Dynamics Simulations
  ▪ NANO 605/SYDE 683 Design of MEMS & NEMS
  ▪ NANO 606/SYDE 682 Advanced MicroElectroMechanical Systems: Physics, Design & Fabrication
	Degree requirements
	• **Courses**
	  ○ Nanotechnology core courses:
	  ▪ NANO 601 Characterization of Nanomaterials
	  ▪ NANO 602 Structure and Spectroscopy of Nanoscale Materials
	  ▪ NANO 603 Nanocomposites
	  ▪ NANO 604 Nanomechanics and Molecular Dynamics Simulations
	  ▪ NANO 605/SYDE 683 Design of MEMS & NEMS
	  ▪ NANO 606/SYDE 682 Advanced MicroElectroMechanical Systems: Physics, Design & Fabrication
	  ▪ NANO 707 From Atoms to Crystals, Quantum Wells, Wires and Dots

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

Students currently registered in the Nanotechnology programs may enroll in NANO 707 and apply it to their core course requirements provided they have not taken any of the course's anti-reqs.

Department/School approval date (mm/dd/yy):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 09/15/22
Faculty approval date (mm/dd/yy): SFC 03/14/23; EFC 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Engineering

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: CHE

Course number: 603

Course ID:

Course title (max. 100 characters including spaces): Chemical Engineering Thermodynamics

Course short title (max. 30 characters including spaces): CHE Thermodynamics

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Introduction to the statistical foundations of thermodynamic quantities (entropy, pressure, temperature, free energy) and relations. Thermodynamics of multicomponent mixtures including property estimation, phase equilibrium, chemical equilibrium, and combined phase/chemical equilibrium. Estimation of

Gibbs energy and fugacity of multicomponent mixtures. Example applications such as: combined phase/chemical equilibrium in chemical reactors, biochemical reactors, and electrolyte solutions.

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

This course is being proposed in direct response to the external assessment and self-study of the CHE graduate program conducted in 2017. As a result of this process, the Department committed to “offer a course in Thermodynamics. The exact timing of the first offering depends on resource availability, but the Department is aiming to deliver the course in 2019.” Chemical Engineering Thermodynamics is a foundational part of a CHE curriculum, as is reflected by all Canadian CHE graduate programs offering a similar course except for UW’s department. The introduction of this course will correct this issue and significantly improve the rigor of the CHE graduate program.

Form completed by: Nasser Mohieddin Abukhdeir
Department/School approval date (12/05/2022):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/15/22
Faculty approval date (mm/dd/yy): 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies
Program Revision Template

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

Faculty: Engineering

Program: Master of Applied Science (MASc) in Systems Design Engineering - Aeronautics

Program contact name(s): Eihab Abdel-Rahman

Form completed by: Jessica Sparry

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Update the Master's Thesis Examining Committee requirements for all MASc in SYDE programs.

Is this a major modification to the program? No

Rationale for change(s):

Systems Design Engineering is a department which prides itself on the interdisciplinary and diverse nature of its researchers. To ensure students receive feedback that encourages this interdisciplinary mindset, it is important that students' thesis committees include members from outside the Department of Systems Design Engineering.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-systems-design-engineering/master-applied-science-masc-systems-design-engineering-aeronautics

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Degree requirements **Master's Thesis** • Students must submit a thesis embodying the results of independent research work to the satisfaction of an Examining Committee. ~~The composition of the Examining Committee must be consistent with the committee composition outlined in the Faculty of Engineering minimum requirements section of the Graduate Studies~~	**Degree requirements** **Master's Thesis** • Students must submit a thesis embodying the results of independent research work to the satisfaction of an Examining Committee. The topic of the thesis must be applicable to Systems Design Engineering and Aeronautics and is arranged by the supervisor(s) and the

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
~~Academic Calendar.~~ The topic of the thesis must be applicable to Systems Design Engineering and Aeronautics and is arranged by the supervisor(s) and the student.	student. The composition of the Examining Committee must be as follows: ○ The student's supervisor(s) ○ At least one faculty member from within the Department of Systems Design Engineering ○ At least one faculty member from outside the Department of Systems Design Engineering ○ No more than one adjunct faculty member (including Professors Emeriti) may serve on the Examining Committee . Adjunct appointments require the approval of the Associate Dean, Graduate from the student's home faculty. ○ At least two of the faculty members on the committee must be tenure or tenure-track.

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

Current students who have not had their committee approved may abide by the new thesis committee requirements.

Department/School approval date (mm/dd/yy): 01/12/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/01/22
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Graduate Studies
Program Revision Template

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

Faculty: Engineering

Programs: 1) Master of Applied Science (MASc) in Systems Design Engineering

2) Master of Applied Science (MASc) in Systems Design Engineering - Nanotechnology

Program contact name(s): Eihab Abdel-Rahman

Form completed by: Jessica Sparry

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Update the Master's Thesis Examining Committee requirements for all MASc in SYDE programs.

Is this a major modification to the program? No

Rationale for change(s):

Systems Design Engineering is a department which prides itself on the interdisciplinary and diverse nature of its researchers. To ensure students receive feedback that encourages this interdisciplinary mindset, it is important that students' thesis committees include members from outside the Department of Systems Design Engineering.

Proposed effective date: Term: Spring Year: 2023

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

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-systems-design-engineering/master-applied-science-masc-systems-design-engineering-nanotechnology

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Degree requirements **Master's Thesis** • Students must submit a thesis embodying the results of independent research work to the satisfaction of an Examining Committee.	**Degree requirements** **Master's Thesis** • Students must submit a thesis embodying the results of independent research work to the satisfaction of an Examining Committee.

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
~~The composition of the Examining Committee must be consistent with the committee composition outlined in the Faculty of Engineering minimum requirements section of the Graduate Studies Academic Calendar.~~ The topic of the thesis is arranged by the supervisor(s) and the student.	The topic of the thesis is arranged by the supervisor(s) and the student. The composition of the Examining Committee must be as follows: ○ The student's supervisor(s) ○ At least one faculty member from within the Department of Systems Design Engineering ○ At least one faculty member from outside the Department of Systems Design Engineering ○ No more than one adjunct faculty member (including Professors Emeriti) may serve on the Examining Committee. Adjunct appointments require the approval of the Associate Dean, Graduate from the student's home faculty. ○ At least two of the faculty members on the committee must be tenure or tenure-track.

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

Current students who have not had their committee approved may abide by the new thesis committee requirements.

Department/School approval date (mm/dd/yy): 01/12/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 12/01/22
Faculty approval date (mm/dd/yy): 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Graduate Studies
Program Revision Template

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

Faculty: Engineering

Programs: 1) Master of Engineering (MEng) in Electrical and Computer Engineering

2) Master of Engineering (MEng) in Electrical and Computer Engineering - Co-operative Program

Program contact name(s): Chris Nielsen, Jared Rank

Form completed by: Jared Rank

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Removing ECE 663 from the list of compulsory courses associated with the Graduate Specialization in Sustainable Energy and adding it to the list of elective courses. The number of compulsory and elective courses is also being revised.

Is this a major modification to the program? No

Rationale for change(s):

Students pursuing the Graduate Specialization in Sustainable Energy must complete ECE 660 which is a fundamental course covering Sustainable Energy topics, students can then select courses from the list of electives based on their interests.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-electrical-and-computer-engineering/master-engineering-meng-electrical-and-computer-engineering

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-electrical-and-computer-engineering/master-engineering-meng-electrical-and-computer-engineering-co-operative-program-direct-entry

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

Degree requirements
• **Courses**
  ○ Students must successfully complete 8 one-term courses (0.50 unit weight)
	Degree requirements
	• **Courses**
	  ○ Students must successfully complete 8 one-term courses (0.50 unit weight)

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
acceptable for credit by the Department. ○ Students may register for any ECE course at the 600 or 700 levels. ○ A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Mathematics and Science. Students opting for the Graduate Specialization in Business Leadership are allowed to take a maximum of 4 courses from outside ECE, but from the specified list of BE/BET courses, detailed below. ○ A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. Students who receive a grade of less than 65% may be permitted to take a maximum of 2 additional courses to meet the minimum averages for the degree requirements (outlined above). ○ Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses, as the number of minimum required courses may differ. ○ Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations: 1. Artificial Intelligence and Machine Learning 2. Biomedical Engineering 3. Business Leadership 4. Computer Networking and Security 5. Nanoelectronic Circuits and Systems 6. Nanoelectronic Devices and Materials 7. Software 8. Sustainable Energy ○ A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization.	acceptable for credit by the Department. ○ Students may register for any ECE course at the 600 or 700 levels. ○ A minimum of 5 courses must be taken from within the ECE Department. A maximum of 3 courses may be taken from outside the Department but must be from the faculties of Engineering, Mathematics and Science. Students opting for the Graduate Specialization in Business Leadership are allowed to take a maximum of 4 courses from outside ECE, but from the specified list of BE/BET courses, detailed below. ○ A minimum grade of 65% in each of the 8 courses and a minimum cumulative average of 70% are required to remain in the program. Students who receive a grade of less than 65% may be permitted to take a maximum of 2 additional courses to meet the minimum averages for the degree requirements (outlined above). ○ Students wishing to complete a Graduate Specialization as part of their MEng program should consult the list of required courses for each Graduate Specialization before selecting courses, as the number of minimum required courses may differ. ○ Students in the MEng in Electrical and Computer Engineering program may choose to pursue one of the following Graduate Specializations: 1. Artificial Intelligence and Machine Learning 2. Biomedical Engineering 3. Business Leadership 4. Computer Networking and Security 5. Nanoelectronic Circuits and Systems 6. Nanoelectronic Devices and Materials 7. Software 8. Sustainable Energy ○ A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization.

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. ○ All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below. ○ Note: Not all elective courses for any given Graduate Specialization are guaranteed to be offered each year. Students are encouraged to take elective courses when they are offered and should plan accordingly. ○ Students will be able to complete the Business Leadership Graduate Specialization along with 1 other ECE Graduate Specialization, noting the following: ▪ Each course will only be counted towards one Graduate Specialization and the MEng degree. ▪ The number of required courses for the MEng degree will increase from 8 to 9 or 10 depending on the requirements associated with the Graduate Specializations. ○ Students must consult with the ECE Masters Coordinator to finalize their plan of study and to ensure that they are able to meet the degree and Graduate Specialization requirements within the program time limits.	A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. ○ All MEng Graduate Specializations in Electrical and Computer Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for each of the Graduate Specializations are described below. ○ Note: Not all elective courses for any given Graduate Specialization are guaranteed to be offered each year. Students are encouraged to take elective courses when they are offered and should plan accordingly. ○ Students will be able to complete the Business Leadership Graduate Specialization along with 1 other ECE Graduate Specialization, noting the following: ▪ Each course will only be counted towards one Graduate Specialization and the MEng degree. ▪ The number of required courses for the MEng degree will increase from 8 to 9 or 10 depending on the requirements associated with the Graduate Specializations. ○ Students must consult with the ECE Masters Coordinator to finalize their plan of study and to ensure that they are able to meet the degree and Graduate Specialization requirements within the program time limits.
8. Graduate Specialization in Sustainable Energy ○ To receive the Graduate Specialization in Sustainable Energy, students must successfully complete ~~2~~ compulsory course~~s~~ and ~~3~~ elective courses:	8. Graduate Specialization in Sustainable Energy ○ To receive the Graduate Specialization in Sustainable Energy, students must successfully complete 1 compulsory course and 4 elective courses:

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
▪ Compulsory course~~s~~: ▪ ECE 660 Operation and Control of Future Integrated Energy Systems ▪ ~~ECE 663 Energy Processing~~ ▪ Elective courses (choose ~~3~~ from the following list): ▪ ECE 632 Photovoltaic Energy Conversion ▪ ECE 662 Power System Analysis and Control ▪ ECE 665 High Voltage Engineering Applications ▪ ECE 666 Power Systems Operation ▪ ECE 668 Distribution System Engineering ▪ ECE 669 Dielectric Materials ▪ ECE 761 HVDC and FACTS ▪ ECE 762 Power System Components and Modelling ▪ ECE 763 Sustainable Distributed Power Generation ▪ ECE 765 Power System Protection and Relaying ▪ ECE 768 Power System Quality	▪ Compulsory course: ▪ ECE 660 Operation and Control of Future Integrated Energy Systems ▪ Elective courses (choose <u>4</u> from the following list): ▪ ECE 632 Photovoltaic Energy Conversion ▪ ECE 662 Power System Analysis and Control ▪ <u>ECE 663 Energy Processing</u> ▪ ECE 665 High Voltage Engineering Applications ▪ ECE 666 Power Systems Operation ▪ ECE 668 Distribution System Engineering ▪ ECE 669 Dielectric Materials ▪ ECE 761 HVDC and FACTS ▪ ECE 762 Power System Components and Modelling ▪ ECE 763 Sustainable Distributed Power Generation ▪ ECE 765 Power System Protection and Relaying ▪ ECE 768 Power System Quality

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

Students currently registered in the program will be minimally impacted by this change, as they will have the flexibility to now only need ECE 660 as a core course and can use ECE 663 as an elective.

Department/School approval date (mm/dd/yy): 02/16/2023
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/09/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

FACULTY OF ENVIRONMENT - GRADUATE STUDIES COMMITTEE

REPORT TO FACULTY COUNCIL

April 10th 2023

1. **Courses Changes for Approval**
    - **a.** GGOV 660 / SUSM 660: Cross-list with PSCI 609

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Environment

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Cross-listing PSCI 609 with SUSM 660/GGOV 660.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: SUSM

Course number: 660

Course ID: 015932

Course title (max. 100 characters including spaces): Public International Law

Course short title (max. 30 characters including spaces): Public Intl Law

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This survey course will provide students with a systematic introduction to the international legal system. Topics to be covered include: the origins and nature of the international legal system; the formation, sources and application of international law; the law of treaties; international legal personality; the institutional framework of international law; the relationship between international law and municipal law; the relationship

between states and territory; law of the sea; state jurisdiction; jurisdictional immunities of states; state responsibility; and a selection of substantive international legal topics including, as time permits, international trade, international investment, the use of force by states, and/or international humanitarian law.

Meet type(s): Seminar Choose an item. Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☒ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status: *GGOV 660 / PSCI 609 (course revision requests to add the PSCI cross-listing to be submitted by GGOV, and course activation paperwork to be submitted by the PSCI department)*

Sections combined/held with:

Rationale for request:

To help boost overall enrolments for this course through joint cross-listing and since PSCI students are likely to take interest in this course.

Form completed by:
Department/School approval date (mm/dd/yy): 11/15/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy): 03/23/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

From: **Faculty of Health Graduate Studies Committee (March 1, 2023)**

To: **Admin Council (March 8, 2023) for approval**

Graduate calendar changes for Faculty of Health

1. PROGRAM CHANGES
1.1 School of Public Health Sciences* effective Spring 2023

1.1.1 **Motion:** Revise HLTH 639. Updating the Course description, Meet type/components, and Delivery mode.

Rationale: During the pandemic this course was offered using a hybrid approach of asynchronous and synchronous virtual learning. Using this delivery approach enabled more health graduate students to take the course. It also allowed more cases from all over the country to be included in the programs for the course.

2. PROGRAM CHANGES
2.1 Kinesiology & Health Sciences* effective Spring 2023

2.2.1 **Motion:** Revise KIN 655.

Rationale: This revision is necessary to change the course credit weight from 0.25 to 0.50, to update the course description and to update the meet types/course components. These changes are necessary as this course will now be a required course in our new Graduate Specialization in Movement and Exercise Sciences and consequently has been refined to more strongly link and blend with other required courses in the specialization. The change also reflects greater consideration of Graduate Work Integrated Learning (GRAD WIL) opportunities.

2.2.2 **Motion:** Inactivate KIN 656.

Rationale: This 0.25 credit course is being removed and replaced by KIN 693 which will provide a more comprehensive approach to the design and implementation of exercise based on cardiovascular and movement-based assessments.

2.2.3 **Motion:** Add KIN 688.

Rationale: The Department of Kinesiology and Health Sciences has sought approval for Graduate Specialization in Movement and Exercise Sciences within its MKin degree program. This course request is to create a special topics course for students that have interest in the practice of kinesiology. Students can choose to take this special topics course as the elective course necessary to meet their course requirements for the Graduate Specialization.

2.2.4 **Motion:** Revise KIN 691.

Rationale: This revision is necessary to change the course credit weight from 0.25 to 0.50, to update the course description and to update the meet types/course components. These changes are necessary as this course will now be a required course in our new Graduate Specialization in Movement and Exercise Sciences and consequently has been refined to more strongly link and blend with other required courses in the specialization. The change also reflects greater consideration of Graduate Work Integrated Learning (GRAD WIL) opportunities.

2.2.5 **Motion:** Inactivate KIN 692.

Rationale: This 0.25 credit course is being removed and replaced by KIN 693 which will provide a more comprehensive approach to the design and implementation of exercise based on cardiovascular and movement-based assessments.

2.2.6 **Motion:** Add KIN 693.

Rationale: This new 0.50 credit course replaces two previous 0.25 credit courses and offers learners with a more integrated approach to interpreting cardiovascular and movement assessment information to inform exercise prescription. This course will be a required course in our new Graduate Specialization in Movement and Exercise Sciences. This course, offered primarily as a practicum, also reflects greater consideration of Graduate Work Integrated Learning (GRAD WIL) opportunities.

***attachment**

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description, Meet type/components, and Delivery mode.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: HLTH

Course number: 639

Course ID: 016164

Course title (max. 100 characters including spaces): Experiential Learning in Evaluation

Course short title (max. 30 characters including spaces): Experiential Learning - Evaluation

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description:

Current description: This intensive short course (0.5 credits) will provide graduate students with hands-on experience in designing evaluation processes for programs, services, responses and/or interventions.

Students will be exposed to contemporary trends and issues in evaluation theory, as well as methods and practice, while working with stakeholders. Course content covers evaluation planning, design and implementation. Attention will be given to theories of change, stakeholder engagement, evaluation approaches and methodologies. Discussions extend beyond basic evaluation to include interpretation and dissemination of findings, as well as evaluation management. The course uses real world problems across a range of applied health interests, and emphasizes experiential learning through a case- and team-based approach. This course is typically delivered in a one-week block held on the UW main campus, with additional online components.

Revised description: This course will provide graduate students with hands-on experience in designing evaluation processes for programs, services, responses and/or interventions. Students will be exposed to contemporary trends and issues in evaluation theory, as well as methods and practice, while working with stakeholders. Course content covers evaluation planning, design and implementation. Attention will be given to theories of change, stakeholder engagement, evaluation approaches and methodologies. Working with stakeholders to understand program context and apply it to the design of an evaluation is a key feature of this course. The course uses real world problems across a range of applied health interests, and emphasizes experiential learning through a case- and team-based approach.

Meet type(s): Lab Lecture Seminar Choose an item.

Primary meet type: Lab

Delivery mode: Only offered online

Requisites: SPHS Grad Students

Special topics course: Yes ☐ No ☐

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with: REC 620

Rationale for request: During the pandemic this course was offered using a hybrid approach of asynchronous and synchronous virtual learning. Using this delivery approach enabled more health graduate students to take the course. It also allowed more cases from all over the country to be included in the programs for the course.

Form completed by: Jennifer Yessis
Department/School approval date (02/17/23):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/15/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description, Course credit weight, and Meet type/course components.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: KIN

Course number: 655

Course ID: 015534

Course title (max. 100 characters including spaces): Theory and Practice of Movement Assessment

Course short title (max. 30 characters including spaces): Movement Assessment

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description:

Current description: This seminar and laboratory based course will examine the theoretical and practical use of movement and strength assessment technologies and techniques. This course will cover approaches ranging

from advanced research based technologies to clinical methods for the purpose of assessment. The course will also explore emerging technologies for assessment, including wireless and wearable technologies. The laboratory content will reinforce skill-based components to familiarize students with the use of a range of tools and techniques.

Revised description: A person-centred approach will be applied to identify and interpret individual and contextual factors that affect exercise safety, adherence, and effectiveness in apparently healthy adults. Students will learn to (in)formally assess barriers and facilitators to physical activity, posture, balance, joint mobility, physical competency, and muscular capacity, all for the purpose of designing exercise programs. Informed by best available evidence at the kinesiology theory–practice nexus, an interdisciplinary perspective is implicitly adopted.

Meet type(s): Practicum Seminar Clinical Lecture

Primary meet type: Practicum

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

This revision is necessary to change the course credit weight from 0.25 to 0.50, to update the course description and to update the meet types/course components. These changes are necessary as this course will now be a required course in our new Graduate Specialization in Movement and Exercise Sciences and consequently has been refined to more strongly link and blend with other required courses in the specialization. The change also reflects greater consideration of Graduate Work Integrated Learning (GRAD WIL) opportunities.

Form completed by: Tyson Beach
Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: KIN

Course number: 656

Course ID: 015880

Course title (max. 100 characters including spaces): Interpretation of Movement Assessment and Exercise Prescription

Course short title (max. 30 characters including spaces):

Grading basis: Choose an item.

Course credit weight: Choose an item.

Course consent required: Choose an item.

Course description:

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

Primary meet type: Choose an item.

Delivery mode: Choose an item.

Requisites:

Special topics course: Yes ☐ No ☐

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

This 0.25 credit course is being removed and replaced by KIN 693 which will provide a more comprehensive approach to the design and implementation of exercise based on cardiovascular and movement-based assessments.

Form completed by: Steven Fischer
Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: KIN

Course number: 688

Course ID:

Course title (max. 100 characters including spaces): Selected Topics in Kinesiology

Course short title (max. 30 characters including spaces): Selected Topics in Kinesiology

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description:

Meet type(s): Clinical Lab Practicum Seminar

Primary meet type: Practicum

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☒ No ☐

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

The Department of Kinesiology and Health Sciences has sought approval for Graduate Specialization in Movement and Exercise Sciences within its MKin degree program. This course request is to create a special topics course for students that have interest in the practice of kinesiology. Students can choose to take this special topics course as the elective course necessary to meet their course requirements for the Graduate Specialization.

Form completed by: Steven Fischer
Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description, Course credit weight, and Meet type/course components.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: KIN

Course number: 691

Course ID: 015535

Course title (max. 100 characters including spaces): Theory and Practice of Cardiorespiratory Assessment

Course short title (max. 30 characters including spaces): Cardiorespiratory Assessment

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description:

Current description: This seminar and laboratory based course will examine the theoretical and practical use of tests for the cardiorespiratory system and assess the functional status of clients within human performance

and clinical exercise physiology target pathologies. Students will review and interpret the literature to construct, apply and justify the inclusion of exercise assessment modalities (e.g. Cardiac Stress Tests, Cardiorespiratory Exercise Testing (VO2). The laboratory content will reinforce skill-based components to familiarize students with the use of a range of tools and techniques.

Revised description: This course will examine the theoretical and practical use of cardiorespiratory and metabolic assessments techniques to assess the functional status of participants within human performance and clinical exercise physiology targeted populations. Students will review and interpret the literature to construct, apply and justify the inclusion of exercise assessment modalities (e.g. Cardiac Stress Tests, Cardiorespiratory Exercise Testing (VO2), Body composition) and to develop proficiency in interpretation of the assessments. The clinical content will reinforce skill-based components to familiarize students with the use of a range of tools and techniques. A combination of hands-on and didactic activities will be used together with experiential and adult learning principles and practice.

Meet type(s): Practicum Seminar Clinical Lecture

Primary meet type: Practicum

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

This revision is necessary to change the course credit weight from 0.25 to 0.50, to update the course description and to update the meet types/course components. These changes are necessary as this course will now be a required course in our new Graduate Specialization in Movement and Exercise Sciences and consequently has been refined to more strongly link and blend with other required courses in the specialization. The change also reflects greater consideration of Graduate Work Integrated Learning (GRAD WIL) opportunities.

Form completed by: Caryl Russell
Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☒ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: KIN

Course number: 692

Course ID: 015885

Course title (max. 100 characters including spaces): Interpretation of Cardiorespiratory Assessment and Exercise Prescription

Course short title (max. 30 characters including spaces):

Grading basis: Choose an item.

Course credit weight: Choose an item.

Course consent required: Choose an item.

Course description:

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

Primary meet type: Choose an item.

Delivery mode: Choose an item.

Requisites:

Special topics course: Yes ☐ No ☐

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

This 0.25 credit course is being removed and replaced by KIN 693 which will provide a more comprehensive approach to the design and implementation of exercise based on cardiovascular and movement-based assessments.

Form completed by: Steven Fischer
Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Health

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: KIN

Course number: 693

Course ID:

Course title (max. 100 characters including spaces): Theory and Practice of Exercise Programming

Course short title (max. 30 characters including spaces): Exercise Programming

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Complimenting knowledge and skills developed in KIN655 and KIN691 students will review and interpret the literature and assessment results to design and deliver individualized exercise programs. Students will learn to elicit and monitor structural and functional responses and

adaptations to physical exercise by applying fundamental movement and exercise science theory from best available research- and practice-based evidence. Students will demonstrate and apply health-, fitness- and performance-promoting exercise techniques that will achieve the desired outcome in a safe and effective manner.

Meet type(s): Practicum Lecture Clinical Seminar

Primary meet type: Practicum

Delivery mode: On-campus

Requisites: Co-requisite with KIN 655 and KIN 691

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

This new 0.50 credit course replaces two previous 0.25 credit courses and offers learners with a more integrated approach to interpreting cardiovascular and movement assessment information to inform exercise prescription. This course will be a required course in our new Graduate Specialization in Movement and Exercise Sciences. This course, offered primarily as a practicum, also reflects greater consideration of Graduate Work Integrated Learning (GRAD WIL) opportunities.

Form completed by: Caryl Russell
Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies
Program Revision Template

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

Faculty: Health

Program: Master of Science (MSc) in Kinesiology and Health Sciences

Program contact name(s): Steven Fischer, Alicia Nadon

Form completed by: Alicia Nadon

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Removing KIN 692 from the list of elective courses associated with the Graduate Research Field in Physiology and Nutrition.

Is this a major modification to the program? No

Rationale for change(s):

KIN 692 is being inactivated and replaced by KIN 693 which will be a required course in our new Graduate Specialization in Movement and Exercise Sciences offered through our MKin program. The new course will provide a more comprehensive approach to the design and implementation of exercise based on cardiovascular and movement-based assessments.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/applied-health-sciences/department-kinesiology-and-health-sciences/master-science-msc-kinesiology-and-health-sciences

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

Degree requirements
 	
• **Courses**
  ○ Students must successfully complete a minimum of 2.00 units of graduate courses (e.g., 4 courses each at 0.50 unit weight), including KIN 630 Research Design and Statistical Analysis (0.50 unit weight) or an equivalent course (related to quantitative or qualitative analysis, such as research methods, modelling,
	Degree requirements
	
	• **Courses**
	  ○ Students must successfully complete a minimum of 2.00 units of graduate courses (e.g., 4 courses each at 0.50 unit weight), including KIN 630 Research Design and Statistical Analysis (0.50 unit weight) or an equivalent course (related to quantitative or qualitative analysis, such as research methods, modelling,

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
mathematics, or statistics), with the approval of the Department Graduate Officer. All graduate courses must be assigned a numerical grade. Students must obtain an average of at least 75% in the set of courses which they present in fulfilment of course requirements. A grade below 70% on any individual course or an average below 75% on the set of courses for the degree will result in a review of the student's status by the Department Graduate Committee. If a student receives a grade in any individual course below 60%, the Department Graduate Committee review may result in the requirement to withdraw from the program. If the student is permitted to proceed, any course with a grade below 60% will not be eligible towards the degree requirements, thus requiring the course to be repeated or additional course work to be completed. ○ Students in the MSc in Kinesiology program may also wish to pursue one of the following Graduate Research Fields: 1. Biomechanics 2. Neuroscience 3. Physiology and Nutrition ○ A Graduate Research Field is a University credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research and a set of courses that together provide an in-depth study in the area of the Graduate Research Field. A student will only obtain the Graduate Research Field on their transcript if they have completed the requirements associated with the MSc degree and the requirements associated with the Graduate Research Field. Students will be limited to one Graduate Research Field designation for their MSc in Kinesiology degree. ○ All MSc Graduate Research Fields in Kinesiology consist of a Master's Seminar, a Master's Thesis that is confirmed by the Department of Kinesiology and Health Sciences to be in the chosen Graduate Research	mathematics, or statistics), with the approval of the Department Graduate Officer. All graduate courses must be assigned a numerical grade. Students must obtain an average of at least 75% in the set of courses which they present in fulfilment of course requirements. A grade below 70% on any individual course or an average below 75% on the set of courses for the degree will result in a review of the student's status by the Department Graduate Committee. If a student receives a grade in any individual course below 60%, the Department Graduate Committee review may result in the requirement to withdraw from the program. If the student is permitted to proceed, any course with a grade below 60% will not be eligible towards the degree requirements, thus requiring the course to be repeated or additional course work to be completed. ○ Students in the MSc in Kinesiology program may also wish to pursue one of the following Graduate Research Fields: 1. Biomechanics 2. Neuroscience 3. Physiology and Nutrition ○ A Graduate Research Field is a University credential that is recognized on the student's transcript and is intended to reflect that a student has successfully completed research and a set of courses that together provide an in-depth study in the area of the Graduate Research Field. A student will only obtain the Graduate Research Field on their transcript if they have completed the requirements associated with the MSc degree and the requirements associated with the Graduate Research Field. Students will be limited to one Graduate Research Field designation for their MSc in Kinesiology degree. ○ All MSc Graduate Research Fields in Kinesiology consist of a Master's Seminar, a Master's Thesis that is confirmed by the Department of Kinesiology and Health Sciences to be in the chosen Graduate Research

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Field, and a minimum of 2.0 units of graduate courses. This set of courses is comprised of a mix of required or elective courses. Required courses are those that are prescribed as part of the Graduate Research Field. Elective courses are those that are on a list of courses designated as electives for a given Graduate Research Field. o For any of the Graduate Research Fields below, an equivalent course focused on the Graduate Research Field may replace a required or elective course, with the approval of the Department Graduate Officer. o The course requirements for each of the Graduate Research Fields are described below. 3. Graduate Research Field in Physiology and Nutrition o Students must successfully complete the required and elective courses listed below. An assessment of whether or not the student's thesis warrants the Physiology and Nutrition Graduate Research Field designation will be completed by the Department of Kinesiology and Health Sciences. ▪ Required course: ▪ KIN 630 Research Design and Statistical Analysis ▪ Elective courses: select elective courses amounting to 1.50 unit weights from the following list: ▪ KIN 601 Skeletal Muscle Physiology: Structure & Function ▪ KIN 602 Respiratory and Cardiovascular Physiology ▪ KIN 603 Cardiac and Vascular Smooth Muscle Physiology ▪ KIN 606 Molecular Basis of Disease ▪ KIN 607 Integrative Energy Metabolism in Health and Disease ▪ KIN 608 Introduction to Genetics for the Biosciences	Field, and a minimum of 2.0 units of graduate courses. This set of courses is comprised of a mix of required or elective courses. Required courses are those that are prescribed as part of the Graduate Research Field. Elective courses are those that are on a list of courses designated as electives for a given Graduate Research Field. o For any of the Graduate Research Fields below, an equivalent course focused on the Graduate Research Field may replace a required or elective course, with the approval of the Department Graduate Officer. o The course requirements for each of the Graduate Research Fields are described below. 3. Graduate Research Field in Physiology and Nutrition o Students must successfully complete the required and elective courses listed below. An assessment of whether or not the student's thesis warrants the Physiology and Nutrition Graduate Research Field designation will be completed by the Department of Kinesiology and Health Sciences. ▪ Required course: ▪ KIN 630 Research Design and Statistical Analysis ▪ Elective courses: select elective courses amounting to 1.50 unit weights from the following list: ▪ KIN 601 Skeletal Muscle Physiology: Structure & Function ▪ KIN 602 Respiratory and Cardiovascular Physiology ▪ KIN 603 Cardiac and Vascular Smooth Muscle Physiology ▪ KIN 606 Molecular Basis of Disease ▪ KIN 607 Integrative Energy Metabolism in Health and Disease ▪ KIN 608 Introduction to Genetics for the Biosciences

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
▪ KIN 609 Introduction to Genetics for Biosciences Lab ▪ KIN 632 Clinical Epidemiology and Health Measurement ▪ KIN 646 Physiological and Biochemical Aspects of Nutrition and Health ▪ KIN 680 Selected Topics in Physiology and Nutrition (MSc) ▪ KIN 691 Theory and Practice of Cardiorespiratory Assessment ▪ ~~KIN 692 Interpretation of Cardiorespiratory Assessment and Exercise Prescription~~ ▪ KIN 702 Cardiorespiratory Integration ▪ KIN 704 Bioactive Lipids ▪ Open elective(s) (amounting to 0.50 unit weights)	▪ KIN 609 Introduction to Genetics for Biosciences Lab ▪ KIN 632 Clinical Epidemiology and Health Measurement ▪ KIN 646 Physiological and Biochemical Aspects of Nutrition and Health ▪ KIN 680 Selected Topics in Physiology and Nutrition (MSc) ▪ KIN 691 Theory and Practice of Cardiorespiratory Assessment ▪ KIN 702 Cardiorespiratory Integration ▪ KIN 704 Bioactive Lipids ▪ Open elective(s) (amounting to 0.50 unit weights)

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

This 0.25 credit course is being removed and replaced by KIN 693 which will provide a more comprehensive approach to the design and implementation of exercise based on cardiovascular and movement-based assessments. Students looking for a full 0.5 unit course that focuses on theoretical and practical training of cardiorespiratory assessment can now take KIN 691. KIN 693 can then be taken as part of an open elective.

Department/School approval date (mm/dd/yy): 2/24/23 by e-vote
Reviewed by GSPA (for GSPA use only) ☐ date (mm/dd/yy): 2/16/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Mathematics Graduate Studies report

1. Calendar changes to Pure Math

Motion to define 3 term length of the following MMath programs:

- Master of Mathematics (MMath) in Pure Mathematics
- Master of Mathematics (MMath) in Pure Mathematics - Quantum Information

Motions to change the wording for PMath required courses from:

- Doctor of Philosophy (PhD) in Pure Mathematics
- Doctor of Philosophy (PhD) in Pure Mathematics - Quantum Information

2. Calendar changes to Statistics and Actuarial Science

This item for consideration on SGRC Regular Agenda

Motion to discontinue the MMath Statistics coursework option for:

- Master of Mathematics (MMath) in Statistics

Motion to change of the program requirements for:

- Master of Quantitative Finance (MQF)

Motion to update/change course description and/or title for

- STAT 833 to match changes to STAT 433
- ACTSC 964
- STAT 908 Statistical Inference
- STAT 923 Multivariate Analysis

Motion to create the course ACTSC 969 Stochastic Calculus for Quantitative Finance

3. Calendar change to Computer Science

Motion to change the required English language proficiency (ELP) scores from the alternative higher scores to a new set of required scores for:

- Doctor of Philosophy (PhD) in Computer Science
- Doctor of Philosophy (PhD) in Computer Science - Quantum Information
- Master of Mathematics (MMath) in Computer Science
- Master of Mathematics (MMath) in Computer Science - Quantum Information

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These have been approved by the Mathematics Faculty Council on February 28th, 2023.

Graduate Studies
Program Revision Template

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

Faculty: Mathematics

Programs: 1) Master of Mathematics (MMath) in Pure Mathematics

2) Master of Mathematics (MMath) in Pure Mathematics - Quantum Information

Program contact name(s): Barbara Csima

Form completed by: Barbara Csima

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Articulating the length of program in the GSAC.

Is this a major modification to the program? No

Rationale for change(s):

This change achieves greater clarity on program length in the GSAC which has benefits for students in terms of immigration and program administration.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-pure-mathematics/master-mathematics-mmath-pure-mathematics

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-pure-mathematics/master-mathematics-mmath-pure-mathematics-quantum-information

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

Program information
• **Admit term(s)**
  ○ Fall
  ○ Winter
• **Delivery mode**
  ○ On-campus
• **Program type**
  ○ Master's
	Program information
	• **Admit term(s)**
	  ○ Fall
	  ○ Winter
	• **Delivery mode**
	  ○ On-campus
	• **Length of program**

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
○ Research • **Registration option(s)** ○ Full-time • **Study option(s)** ○ Thesis ○ Master's Research Paper	○ The program is designed to be completed in 3 terms (12 months). Extensions must be approved by the Department Graduate Officer. • **Program type** ○ Master's ○ Research • **Registration option(s)** ○ Full-time • **Study option(s)** ○ Thesis ○ Master's Research Paper

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

This change will not impact currently registered students, it will provide transparency on the duration of the programs.

Department/School approval date (mm/dd/yy): 01/18/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 11/29/22
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Graduate Studies
Program Revision Template

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

Faculty: Mathematics

Program: Doctor of Philosophy (PhD) in Pure Mathematics

Program contact name(s): Barbara Csima

Form completed by: Barbara Csima

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Updating the course requirements.

Is this a major modification to the program? No

Rationale for change(s):

We are updating the course requirements to clarify that none of the 4 required courses can be PMATH graduate courses numbered in the 600s or reading courses. Courses from other units outside of Pure Mathematics require graduate committee approval, and other units have different numbering systems – we had not meant to exclude their 600-level graduate courses altogether. This updated wording matches what we have for our MMath programs.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-pure-mathematics/doctor-philosophy-phd-pure-mathematics

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

Degree requirements
 	
• **Courses**
  ○ The program requires a minimum of 4 graduate courses with an average of at least 70% (with unit weights equal to 0.50) for those entering the PhD program with a Master's degree. At least 3 of the 4 required courses must be PMATH graduate courses numbered in the 800's and 900's. If the 4th course is not a PMATH course it
	Degree requirements
	
	• **Courses**
	  ○ The program requires a minimum of 4 graduate courses with an average of at least 70% (with unit weights equal to 0.50) for those entering the PhD program with a Master's degree. At least 3 of the 4 required courses must be PMATH graduate courses numbered in the 800's and 900's. If the 4th course is not a PMATH course it

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
must be approved by the Pure Mathematics Graduate Committee. None of the 4 required courses can be graduate courses numbered in the 600s or reading courses. Up to 3 course credits may be granted by the Graduate Committee for work completed towards the PhD degree at another institution provided that the relevance of the previous work to the student's proposed program is clearly established. ○ Students entering the program with a Bachelor's degree normally must also satisfy the course requirements of a Master of Mathematics (MMath) degree in addition to those of the PhD program. The number and nature of such courses shall be specified at the time of admission, or early on in the program.	must be approved by the Pure Mathematics Graduate Committee. None of the 4 required courses can be PMATH graduate courses numbered in the 600s or reading courses. Up to 3 course credits may be granted by the Graduate Committee for work completed towards the PhD degree at another institution provided that the relevance of the previous work to the student's proposed program is clearly established. ○ Students entering the program with a Bachelor's degree normally must also satisfy the course requirements of a Master of Mathematics (MMath) degree in addition to those of the PhD program. The number and nature of such courses shall be specified at the time of admission, or early on in the program.

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

Current students would be allowed to use the updated requirement should they choose to.

Department/School approval date (mm/dd/yy): 01/18/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/20/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Graduate Studies
Program Revision Template

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

Faculty: Mathematics

Program: Doctor of Philosophy (PhD) in Pure Mathematics - Quantum Information

Program contact name(s): Barbara Csima

Form completed by: Barbara Csima

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Updating the course requirements.

Is this a major modification to the program? No

Rationale for change(s):

We are updating the course requirements to clarify that none of the 4 required courses can be PMATH graduate courses numbered in the 600s or reading courses. Courses from other units outside of Pure Mathematics require graduate committee approval, and other units have different numbering systems – we had not meant to exclude their 600-level graduate courses altogether. This updated wording matches what we have for our MMath programs.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-pure-mathematics/doctor-philosophy-phd-pure-mathematics-quantum-information

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

Degree requirements
 	
• **Courses**
  ○ The program requires a minimum of 4 graduate courses, including the 2 Quantum Information core courses, with an average of at least 70% (with unit weights equal to 0.50) for those entering the PhD program with a Master's degree. At least 3 of the 4 required courses must be PMATH graduate courses numbered in the
	Degree requirements
	
	• **Courses**
	  ○ The program requires a minimum of 4 graduate courses, including the 2 Quantum Information core courses, with an average of at least 70% (with unit weights equal to 0.50) for those entering the PhD program with a Master's degree. At least 3 of the 4 required courses must be PMATH graduate courses numbered in the

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
800's and 900's, and at least 1 of the 4 required courses must be a QIC graduate course (note that cross-listed courses, such as PMATH 871/QIC 710, are regarded as both PMATH and QIC courses). If the 4th course is not a PMATH or QIC course it must be approved by the Pure Mathematics Graduate Committee. None of the 4 required courses can be graduate courses numbered in the 600s or reading courses. Up to 3 course credits may be granted by the Graduate Committee for work completed towards the PhD degree at another institution provided that the relevance of the previous work to the student's proposed program is clearly established. o Quantum Information core courses: ▪ QIC 710 Quantum Information Processing (equivalent to PMATH 871 Quantum Information Processing) ▪ QIC 750 Implementation of Quantum Information Processing o If students have credit for a course deemed equivalent to a particular core QIC course by the IQC Curriculum Committee, then that part of the core requirement may be waived, but the minimum number of required courses will remain 4. o Students entering the program with a Bachelor's degree normally must also satisfy the course requirements of a Master of Mathematics (MMath) degree in addition to those of the PhD program. The number and nature of such courses shall be specified at the time of admission, or early on in the program.	800's and 900's, and at least 1 of the 4 required courses must be a QIC graduate course (note that cross-listed courses, such as PMATH 871/QIC 710, are regarded as both PMATH and QIC courses). If the 4th course is not a PMATH or QIC course it must be approved by the Pure Mathematics Graduate Committee. None of the 4 required courses can be <u>PMATH</u> graduate courses numbered in the 600s or reading courses. Up to 3 course credits may be granted by the Graduate Committee for work completed towards the PhD degree at another institution provided that the relevance of the previous work to the student's proposed program is clearly established. o Quantum Information core courses: ▪ QIC 710 Quantum Information Processing (equivalent to PMATH 871 Quantum Information Processing) ▪ QIC 750 Implementation of Quantum Information Processing o If students have credit for a course deemed equivalent to a particular core QIC course by the IQC Curriculum Committee, then that part of the core requirement may be waived, but the minimum number of required courses will remain 4. o Students entering the program with a Bachelor's degree normally must also satisfy the course requirements of a Master of Mathematics (MMath) degree in addition to those of the PhD program. The number and nature of such courses shall be specified at the time of admission, or early on in the program.

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

Current students would be allowed to use the updated requirement should they choose to.

Department/School approval date (mm/dd/yy): 01/18/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 01/20/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

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

Graduate Studies
Program Revision Template

This item for consideration on SGRC Regular Agenda

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

Faculty: Mathematics

Program: Master of Mathematics (MMath) in Statistics

Program contact name(s): Shoja'eddin Chenouri, Mary Lou Dufton

Form completed by: Mary Lou Dufton

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Discontinue the coursework study option from the MMath in Statistics *program.*

Is this a major modification to the program? Yes

Rationale for change(s):

The coursework study option, which includes a required specialization in Data Science, is being discontinued because the option has been replaced by a) the MMath in Data Science, and b) the Master of Data Science and Artificial Intelligence (MDSAI) programs (note: these Data Science programs are supported by the Department of Statistics and Actuarial Science, the Department of Combinatorics and Optimization, and the School of Computer Science). The Department of Statistics and Actuarial Science has not accepted applications to the coursework study option since Spring 2019 and has directed applicants to the Data Science programs.

Proposed effective date: Term: ~~Spring~~ Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-statistics-and-actuarial-science/master-mathematics-mmath-statistics

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Graduate research fields • Computational Statistics • Finance • Industrial Statistics • Probability • Statistical Theory and Methods	**Graduate research fields** • Computational Statistics • Finance • Industrial Statistics • Probability • Statistical Theory and Methods

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

Program information
 	
• **Admit term(s)**
  ○ Fall
 	
• **Delivery mode**
  ○ On-campus
 	
• **Program type**
  ○ Master's
  ○ Research
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Thesis
  ○ Master's Research Paper
  ~~○ Coursework~~
 	
Admission requirements
 	
• **Minimum requirements**
  ○ A four-year Honours Bachelor degree with a significant statistics and/or actuarial science component.
  ○ An overall 78% average from a Canadian university (or its equivalent).
  ○ An interview may be required.
 	
• **Application materials**
  ○ Résumé
  ○ Supplementary information form
  ○ Transcript(s)
 	
• **References**
  ○ Number of references: 3
  ○ Type of references: normally from academic sources
 	
• **English language proficiency (ELP)** (if applicable)
 	
Degree requirements
 	
Thesis option:
 	
• **Graduate Academic Integrity Module (Graduate AIM)**
 	
• **Courses**
	Program information
	
	• **Admit term(s)**
	  ○ Fall
	
	• **Delivery mode**
	  ○ On-campus
	
	• **Program type**
	  ○ Master's
	  ○ Research
	
	• **Registration option(s)**
	  ○ Full-time
	  ○ Part-time
	
	• **Study option(s)**
	  ○ Thesis
	  ○ Master's Research Paper
	
	Admission requirements
	
	• **Minimum requirements**
	  ○ A four-year Honours Bachelor degree with a significant statistics and/or actuarial science component.
	  ○ An overall 78% average from a Canadian university (or its equivalent).
	  ○ An interview may be required.
	
	• **Application materials**
	  ○ Résumé
	  ○ Supplementary information form
	  ○ Transcript(s)
	
	• **References**
	  ○ Number of references: 3
	  ○ Type of references: normally from academic sources
	
	• **English language proficiency (ELP)** (if applicable)
	
	Degree requirements
	
	Thesis option:
	
	• **Graduate Academic Integrity Module (Graduate AIM)**
	
	• **Courses**

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
○ Students must complete 4 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ The 4 courses must include STAT 850 Estimation and Hypothesis Testing and at least 2 900-level STAT courses. • **Graduate Skills Workshop** • **Master's Thesis** ○ Students must complete a thesis and an oral presentation. **Master's Research Paper option:** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must complete 7 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ 3 of the 7 required courses should include: ▪ STAT 830 Experimental Design or STAT 835 Statistical Methods for Process Improvement ▪ STAT 850 Estimation and Hypothesis Testing ▪ STAT 854 Sampling Theory and Practice ○ Exemptions can be made to these required courses at the discretion of the Associate Chair for Graduate Studies. • **Graduate Skills Workshop** • **Master's Research Paper** ○ Students must complete a research paper that will be given a numeric grade which appears on the transcript beside the milestone. ~~**Coursework option:**~~ ~~The coursework option includes a specialization in Data Science.~~ ~~Note: The Department of Statistics and Actuarial Science is not currently accepting applications for the coursework option.~~	○ Students must complete 4 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ The 4 courses must include STAT 850 Estimation and Hypothesis Testing and at least 2 900-level STAT courses. • **Graduate Skills Workshop** • **Master's Thesis** ○ Students must complete a thesis and an oral presentation. **Master's Research Paper option:** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must complete 7 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ 3 of the 7 required courses should include: ▪ STAT 830 Experimental Design or STAT 835 Statistical Methods for Process Improvement ▪ STAT 850 Estimation and Hypothesis Testing ▪ STAT 854 Sampling Theory and Practice ○ Exemptions can be made to these required courses at the discretion of the Associate Chair for Graduate Studies. • **Graduate Skills Workshop** • **Master's Research Paper** ○ Students must complete a research paper that will be given a numeric grade which appears on the transcript beside the milestone.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
• ~~**Graduate Academic Integrity Module (Graduate AIM)**~~ • ~~**Courses**~~ ○ ~~Students must complete 8 one-term (0.50 unit weight) graduate courses [with an overall average of at least 70%] from the Data Science lists of courses.~~ ○ ~~Students should take a minimum of 4 STAT courses, and no courses which are neither STAT nor Computer Science (CS).~~ ○ ~~Students must satisfy the following course requirements:~~ ○ ~~Foundation course:~~ ▪ ~~CS 600 Fundamentals of Computer Science for Data Science~~ ○ ~~Students with a STAT major degree are expected to take the foundation course CS 600. However, STAT major students will be exempted from taking CS 600 if they have a sufficient background in Computer Science; instead they will be required to take another CS course from the elective course list.~~ ○ ~~Required core courses:~~ ▪ ~~STAT 847 Exploratory data analysis~~ ▪ ~~CS 631 Data-Intensive Distributed Analytics~~ ○ ~~1 of the following required breadth courses:~~ ▪ ~~STAT 841 Statistical Learning: Classification~~ ▪ ~~STAT 842 Data Visualization~~ ▪ ~~STAT 844 Statistical Learning: Advanced Regression~~ ○ ~~4 elective courses from the following list:~~ ▪ ~~STAT 840 Computational Inference~~ ▪ ~~STAT 841 Statistical Learning: Classification~~ ▪ ~~STAT 842 Data Visualization~~ ▪ ~~STAT 844 Statistical Learning: Advanced Regression~~ ▪ ~~STAT 946 Topics in Probability and Statistics~~ ▪ ~~CS 638 Principles of Data Management and Use~~	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~▪ CS 648 Database Systems Implementation~~ ~~▪ CS 654 Distributed Systems~~ ~~▪ CS 658 Computer Security and Privacy~~ ~~▪ CS 680 Introduction to Machine Learning~~ ~~▪ CS 685 Machine Learning Theory: Statistical and Computational Foundations~~ ~~▪ CS 686 Introduction to Artificial Intelligence~~ ~~▪ CS 740 Database Engineering~~ ~~▪ CS 741 Parallel and Distributed Database Systems~~ ~~▪ CS 743 Principles of Database Management and Use~~ ~~▪ CS 786 Probabilistic Inference and Machine Learning~~ ~~▪ CS 798 Advanced Research Topics~~ ~~▪ CS 848 Advanced Topics in Databases~~ ~~▪ CS 856 Advanced Topics in Distributed Computing~~ ~~▪ CS 858 Advanced Topics in Cryptography, Security and Privacy~~ ~~▪ CS 870 Advanced Topics in Scientific Computing~~ ~~▪ CS 886 Advanced Topics in Artificial Intelligence~~ ~~o Note: CS 798: CS courses at the 800 level, and STAT courses at the 900 level should be on a topic in Data Science; they are subject to the approval of the Graduate Officer.~~ ~~• **Data Science Requirement**~~ ~~o Students must complete the required core data science courses in order to satisfy the Data Science Requirement milestone.~~	

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

There are no students currently registered in MMath Statistics Data Science Specialization and therefore there is no impact with these changes.

Department/School approval date (11/25/22):

Reviewed by GSPA (for GSPA use only) ▣ date (mm/dd/yy):08/25/22
Faculty approval date (mm/dd/yy):02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Graduate Studies
Program Revision Template

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

Faculty: Mathematics

Program: Master of Quantitative Finance (MQF)

Program contact name(s): Helen Chen (Program Coordinator), Alexander Schied (Program Director)

Form completed by: Alexander Schied

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Current MQF students are required to take the two courses STAT 901 and STAT 902. We propose to replace this requirement by taking the newly created course ACTSC 969 that provides the necessary math background for MQF (Fall term) plus an elective (Winter term).

In addition, we propose to delete the recommendation for the specific elective courses that is currently part of the calendar description.

These changes only apply to the MRP study option of the program.

Is this a major modification to the program? No

Rationale for change(s):

STAT 901 & 902 are two PhD-level courses on measure-theoretic probability theory and stochastic analysis with a clear academic focus. When the MQF program was created, quant jobs in the financial industry were mainly focused on pricing and hedging financial derivatives, for which a strong background in the material provided by STAT 902 is essential. Since then, the industry requirements on quantitative analysts have moved forward and topics such as algorithmic and high-frequency trading or statistical machine learning have become more important. Competing master programs started making corresponding changes about 10 to 15 years ago. Over the past years, we have repeatedly received feedback from MQF Advisory Board members suggesting that MQF could be well-advised to make similar changes to its curriculum.

We envisage the following benefits from dropping STAT 901 & 902 as required courses.

- *While many of the applicants for the MQF program have strong financial and quantitative skills, a significant percentage lacks the background in formal, proof-oriented mathematics that is required to succeed in STAT 901 & 902. Dropping STAT 901 & 902 would thus let us access a larger and more diverse pool of applicants.*
- *Removing STAT 901 & 902 as required courses would set free learning capacity for students, who could thus take additional courses with higher relevance for industry practice.*
- *Out of the sequence STAT 901 & 902, the bulk of material that is relevant for MQF is contained in STAT 902 (for the purpose of the MQF program, STAT 901 serves mainly as a preparation for STAT 902). This means that MQF students have learned stochastic analysis by the end of their second term. However, this material is applied already in both ACTSC 970 & 971, which are taught in the first and second terms of MQF, respectively. The resulting time lag requires current instructors for ACTSC 970 & 971 to introduce the basics of stochastic calculus in their classes. Replacing STAT 901 & 902 with one course taught in term one (Fall) would thus free up redundancies by allowing instructors of ACTSC 970 & 971 to assume that students are already familiar with stochastic calculus.*

- *Currently, instructors for STAT 901 & 902 need to take the needs of MQF students into consideration, as they are the only cohort for which these courses are mandatory. If MQF students were no longer required to take these courses, instructors of STAT 901 & 902 could focus more on the interests of the academically oriented students.*

Nevertheless, some graduate-level math background would still need to be part of the curriculum of MQF, which is why we propose the creation of the new course ACTSC 969.

In addition, we propose to drop the recommendation for specific elective courses that is currently part of the calendar description. The reason is that the Faculty of Mathematics offers many courses that may serve as electives and are in part much more suitable to complement the MQF program than the ones suggested currently. However, not all these courses are offered on a yearly basis and so cannot be added to the calendar description. The MQF program hosts a yearly orientation session for new students, and during this session suitable elective courses, which will be offered during the academic year, are introduced to the students.

Proposed effective date: Term: Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-statistics-and-actuarial-science/master-quantitative-finance-mqf

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

Degree requirements
Thesis option:
• Graduate Academic Integrity Module (Graduate AIM)
• Courses
  ○ Required courses:
  ▪ ACC 770 Finance 1/ACTSC 970 Finance 1
  ▪ ACC 771 Finance 2/ACTSC 971 Finance 2
  ○ Elective courses:
  ▪ 2 courses (0.50 unit weight) approved by the student's academic advisor.
  ○ Students must obtain an overall average of at least 75% in the courses presented in fulfilment of the degree requirements.
• Link(s) to courses
  ○ Actuarial Science (ACTSC) courses
  ○ Statistics (STAT) courses
  ○ Graduate course search
• Master's Thesis
	Degree requirements
	Thesis option:
	• Graduate Academic Integrity Module (Graduate AIM)
	• Courses
	  ○ Required courses:
	  ▪ ACC 770 Finance 1/ACTSC 970 Finance 1
	  ▪ ACC 771 Finance 2/ACTSC 971 Finance 2
	  ○ Elective courses:
	  ▪ 2 graduate-level courses (0.50 unit weight) approved by the student's academic advisor.
	  ○ Students must obtain an overall average of at least 75% in the courses presented in fulfilment of the degree requirements.
	• Link(s) to courses
	  ○ Actuarial Science (ACTSC) courses
	  ○ Statistics (STAT) courses
	  ○ Graduate course search
	• Master's Thesis

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
○ Students will be required to submit a thesis proposal by the end of their second term of study. **Master's Research Paper option:** • Graduate Academic Integrity Module (Graduate AIM) • Courses ○ Required courses: ▪ ACC 770 Finance 1/ACTSC 970 Finance 1 ▪ ACC 771 Finance 2/ACTSC 971 Finance 2 ▪ ACC 772 Finance 3/ACTSC 972 Finance 3 ▪ STAT 850 Estimation and Hypothesis Testing ▪ ~~STAT 901 Theory of Probability 1~~ ▪ ~~STAT 902 Theory of Probability 2~~ ▪ STAT 906 Computer Intensive Methods for Stochastic Models in Finance ▪ STAT 974/ACTSC 974 Financial Econometrics ○ Elective courses: students are required to take ~~1~~ additional graduate level course (0.50 unit weight) approved by the student's academic advisor. ~~Recommended course electives include:~~ ▪ ~~CS 676 Numeric Computation for Financial Modelling~~ ▪ ~~ACTSC 845 Quantitative Risk Management~~ ▪ ~~ACTSC 846 Mathematical Models in Finance~~ ○ Students must obtain an overall average of at least 75% in the courses presented in fulfilment of the degree requirements. • Link(s) to courses ○ Actuarial Science (ACTSC) courses ○ Statistics (STAT) courses ○ Graduate course search • Graduate Studies Internship ○ The Master's Research Paper option consists of two academic terms (fall and winter), followed by a required	○ Students will be required to submit a thesis proposal by the end of their second term of study. **Master's Research Paper option:** • Graduate Academic Integrity Module (Graduate AIM) • Courses ○ Required courses: ▪ ACC 770 Finance 1/ACTSC 970 Finance 1 ▪ ACC 771 Finance 2/ACTSC 971 Finance 2 ▪ ACC 772 Finance 3/ACTSC 972 Finance 3 ▪ <u>ACTSC 969 Stochastic Calculus for Quantitative Finance</u> ▪ STAT 850 Estimation and Hypothesis Testing ▪ STAT 906 Computer Intensive Methods for Stochastic Models in Finance ▪ STAT 974/ACTSC 974 Financial Econometrics ○ Elective courses: students are required to take <u>2</u> additional graduate level courses (0.50 unit weight) approved by the student's academic advisor. ○ Students must obtain an overall average of at least 75% in the courses presented in fulfilment of the degree requirements. • Link(s) to courses ○ Actuarial Science (ACTSC) courses ○ Statistics (STAT) courses ○ Graduate course search • Graduate Studies Internship ○ The Master's Research Paper option consists of two academic terms (fall and winter), followed by a required work term in the spring term, and then one additional academic term (fall). • Master's Research Paper

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
work term in the spring term, and then one additional academic term (fall). • Master's Research Paper	

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

Students currently registered in the program will not be impacted by these changes.

Department/School approval date (mm/dd/yy): 01/13/23
Reviewed by GSPA (for GSPA use only)☒ date (mm/dd/yy): 02/06/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Mathematics

Effective date: Term: Spring Year: 2023

~~Milestone~~

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course title and Course description

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: STAT

Course number: 833

Course ID: 003088

Course title (max. 100 characters including spaces): Stochastic Processes 2

Course short title (max. 30 characters including spaces): Stochastic Processes 2

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: This course provides further ideas and methods in stochastic modelling, with an emphasis on continuous-time stochastic processes. Topics cover time to absorption based quantities and discrete phase-type distributions of discrete-time Markov chains, continuous-time Markov chains with a countable state space, limit distributions for ergodic and absorbing chains, and applications including birth and death processes and queueing

models of practical interest. Other topics may include continuous phase-type distributions, renewal theory and limit theorems for regenerative processes, and phase-type renewal processes

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Requisites: Antirequisite: STAT 433

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with: STAT 433

Rationale for request:
The description for STAT 433 was updated to reflect the content covered in the course. Since this course is held with STAT 433, it made sense to update the description for STAT 833 to also reflect this change.

Form completed by: Shoja'eddin Chenouri and Jessica Leung
Department/School approval date (mm/dd/yy):11/25/22
Reviewed by GSPA (for GSPA use only) ▣ date (mm/dd/yy): 02/06/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Mathematics

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course title and Course description

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: ACTSC

Course number: 964

Course ID: 011275

Course title (max. 100 characters including spaces): Foundations of Quantitative Risk Management

Course short title (max. 30 characters including spaces): Quantitative Risk Management

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Fundamental concepts in quantitative risk management. Topics typically include: risk measures, extreme value theory, financial time series, multivariate distributions, copulas, risk aggregation, and capital allocation. This course has a focus on mathematical and statistical techniques. Other topics may be covered at the discretion of the instructor.

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status: N/A

Sections combined/held with: N/A

Rationale for request:

The current course title seems to indicate that this is a topic course. However, the content of the course is very stable covering foundational topics in the field of Quantitative Risk Management. Some regular topics are added to the calendar description to better reflect the course content

Form completed by: Shoja'eddin Chenouri
Department/School approval date (01/13/23):
Reviewed by GSPA (for GSPA use only) ▣ date (mm/dd/yy):02/06/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Mathematics

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: STAT

Course number: 908

Course ID: 003105

Course title (max. 100 characters including spaces): Statistical Inference

Course short title (max. 30 characters including spaces): Statistical Inference

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description: Asymptotic theory for statistical procedures, such as modes of convergence, Big O, small o calculus, concentration of measures, laws of large numbers, different types of central limit theorems. Parametric, nonparametric, and high-dimensional inference, optimal statistical procedures. Theory of computationally intensive methods, advances in hypothesis testing.

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status: N/A

Sections combined/held with: N/A

Rationale for request: The current course description is at least 3 decades old. Since then, the field of statistics has evolved dramatically. The proposed course description is in response to these advancements.

Form completed by: Shoja'eddin Chenouri
Department/School approval date (01/13/23):
Reviewed by GSPA (for GSPA use only) ▣ date (mm/dd/yy): 02/06/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Mathematics

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):
Updating the Course description

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: STAT

Course number: 923

Course ID: 003113

Course title (max. 100 characters including spaces): Multivariate Analysis

Course short title (max. 30 characters including spaces): Multivariate Analysis

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Not required

Course description:

Multivariate normal and Wishart distributions, estimation and hypothesis testing of mean vectors and covariance matrices and their extensions to high-dimensional setting (n<p), principal component analysis (PCA), factor analysis, canonical analysis, discrimination, and classification with a focus on linear discriminant analysis (LDA) and quadratic discriminant analysis (QDA). Precision matrices for high-dimensional data, high dimensional, and

sparse PCA, Nonlinear PCA.

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Requisites: N/A

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status: N/A

Sections combined/held with: N/A

Rationale for request:
There has been many important advancements in multivariate analysis, particularly in high-dimensional low sample size setting (n<p), over that past several decades. The proposed changes are to update the course to reflect on these important advances.

Form completed by: Shoja'eddin Chenouri
Department/School approval date (01/13/23):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/06/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Mathematics

Effective date: Term: Fall Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☒ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)
suggest ACTSC 969, because this number precedes the sequence ACTSC 970, 971, 972, for w

Course subject code: ACTSC

Course number: 969

Course ID: N/A

Course title (max. 100 characters including spaces): *Stochastic Calculus for Quantitative Finance*

Course short title (max. 30 characters including spaces): *Stochastic Calculus*

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Department

Course description: The course provides an introduction to Itô calculus and stochastic processes in the context of quantitative finance. Topics include: quadratic variation, Itô formula, Itô differential equations, Brownian motion, geometric Brownian motion, martingales, connection between diffusion processes and partial differential equations, Girsanov transform

Meet type(s): Lecture Choose an item. Choose an item. Choose an item.

Primary meet type: Lecture

Delivery mode: On-campus

Prerequisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status: N/A

Sections combined/held with: N/A

Rationale for request: As explained in our accompanying proposal, we want to give students in the Master of Quantitative Finance (MQF) program the option to complete the program without having to take the two PhD-level mathematics courses STAT 901 & STAT 902. The proposed new course would provide those contents from STAT 902 that are still essential for the further MQF curriculum. Its target audience would be MQF students and other graduate students with an interest in quantitative finance. New mathematical concepts will be motivated and illustrated by applications to finance and with real-world financial data. Since providing a rigorous mathematical education has been one of the characteristics and unique selling points of the MQF program, the new course would still contain formal, proof-oriented mathematics, but on a significantly lower technical level than STAT 902. Moreover, students would be familiar with the main concepts of stochastic calculus after the second half of the Fall term, so that these concepts can subsequently be applied in ACTSC 970 & 971.

Form completed by: Alexander Schied
Department/School approval date (mm/dd/yy): 01/13/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/06/23
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

Graduate Studies
Program Revision Template

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

Faculty: Mathematics

Programs: 1) Doctor of Philosophy (PhD) in Computer Science

2) Doctor of Philosophy (PhD) in Computer Science - Quantum Information

3) Master of Mathematics (MMath) in Computer Science

4) Master of Mathematics (MMath) in Computer Science - Quantum Information

Program contact name(s): Mei Nagappan, Denise Shantz

Form completed by: GSPA, Mei Nagappan

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Changing the required English language proficiency (ELP) scores for the Computer Science (CS) graduate programs from the alternative higher scores to a new set of required scores. The School of Computer Science consulted with the Mathematics Associate Dean, Graduate Studies and GSPA on this change and proposed new TOEFL scores. Colleagues at Renison then translated the new TOEFL scores to the other acceptable examinations.

Is this a major modification to the program? No

Rationale for change(s):

The ELP scores are being changed to be similar to those required by the University of Toronto's CS programs so that we are competitive with similar CS graduate programs.

Proposed effective date: Term: ~~Winter~~ Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/general-information-and-regulations/english-language-proficiency

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Graduate Studies accepted examinations and alternative higher scores	**Graduate Studies accepted examinations and alternative higher scores**

Current Graduate Studies Academic Calendar content:

Departments/Schools/programs requiring higher scores are:

- Faculty of Arts: Accounting and Finance; Anthropology; Classical Studies; Digital Experience Innovation; English Language and Literature; Fine Arts; History; Philosophy; Public Service; Religious Studies; Sociology and Legal Studies
- Faculty of Engineering: Architecture
- Faculty of Environment: Climate Change; Climate Risk Management; Development Practice; Economic Development and Innovation; Environment and Business; Environment, Resources and Sustainability; Geography and Environmental Management; Global Governance; Planning; Sustainability Management
- Faculty of Health: Public Health Sciences; Recreation and Leisure Studies
- Faculty of Mathematics: ~~Computer Science;~~ Data Science and Artificial Intelligence; Quantitative Finance

Table of Graduate Studies accepted examinations and alternative higher scores					
Internet-based TOEFL (iBT)	IELTS (Academic)	Cambridge English test (C1 Advanced or C2 Proficiency)	CAEL	PTE (Academic)	EFAS
100; writing 26; speaking 26	7.5; writing 7.0; speaking 7.0	191; minimum 185 in each area	70; 60 per band; 70 writing; 70 speaking	68; writing 65; speaking 65	80% overall in level 400 with at least 75% in writing, oral and academic skills

Proposed Graduate Studies Academic Calendar content:

Departments/Schools/programs requiring higher scores are:

- Faculty of Arts: Accounting and Finance; Anthropology; Classical Studies; Digital Experience Innovation; English Language and Literature; Fine Arts; History; Philosophy; Public Service; Religious Studies; Sociology and Legal Studies
- Faculty of Engineering: Architecture
- Faculty of Environment: Climate Change; Climate Risk Management; Development Practice; Economic Development and Innovation; Environment and Business; Environment, Resources and Sustainability; Geography and Environmental Management; Global Governance; Planning; Sustainability Management
- Faculty of Health: Public Health Sciences; Recreation and Leisure Studies
- Faculty of Mathematics: Data Science and Artificial Intelligence; Quantitative Finance

Table of Graduate Studies accepted examinations and alternative higher scores					
Internet-based TOEFL (iBT)	IELTS (Academic)	Cambridge English test (C1 Advanced or C2 Proficiency)	CAEL	PTE (Academic)	EFAS
100; writing 26; speaking 26	7.5; writing 7.0; speaking 7.0	191; minimum 185 in each area	70; 60 per band; 70 writing; 70 speaking	68; writing 65; speaking 65	80% overall in level 400 with at least 75% in writing, oral and academic skills

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
	Graduate Studies accepted examinations and alternative scores for Computer Science programs

Table of Graduate Studies accepted examinations and alternative scores for Computer Science programs

Internet-based TOEFL (iBT)	IELTS (Academic)	Cambridge English test (C1 Advanced or C2 Proficiency)	CAEL	PTE (Academic)	EFAS
93; writing 22; speaking 22	6.5; writing 6.0; speaking 6.5	180; minimum 176 in each area	70; 60 per band; 70 writing; 70 speaking	63; writing 65; speaking 65	75% overall in level 400 with at least 70% in writing, oral and academic skills

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

Students currently registered will not be impacted by this change. The change will only be effective for new incoming students. For incoming students, since we are lowering the scores from the current ones, we should be able to capture a larger pool of students.

Department/School approval date (mm/dd/yy): 10/12/22
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 10/06/22
Faculty approval date (mm/dd/yy): 02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Faculty of Science
SGRC Submission

MEMORANDUM

To : Kathy Winter
From : Martin Ross, Associate Dean Graduate Studies -Faculty of Science
Date : March 27, 2023
Re : Senate Graduate And Research Council Agenda

I would ask that the motion below be placed on the agenda for the upcoming SGRC meeting. The motions were approved by Science Faculty Council (date indicated on the forms).

Pharmacy

Motion: To approve the revisions of the course descriptions for PHARM 601, PHARM 616A and PHARM 616B, the MSc and PhD thesis proposal courses.

Rationale:

The current course descriptions are long and contain several elements that are normally included in a course syllabus. The new descriptions are more concise and, by removing information that would normally be included in a course syllabus, it will allow course content to be updated from time to time without requiring a revision of the course description.

Faculty of Science:

Motion: To inactivate the Academic Integrity Workshop milestone.

Rationale:

a. The Office of Academic Integrity and the Library have worked together to refresh the mandatory Graduate Academic Integrity Module (Graduate AIM) in Learn. The module is now quite robust, with all required information covered in its content.
b. We would like the inactivate this milestone to eliminate the duplications and redundancies, which will at the same time address the confusion students were having with the double requirement of doing a course and a milestone on academic integrity.

ATTACHMENTS:

Appendix A - PHARM 601 course description revision_2023– Reviewed by GSPA

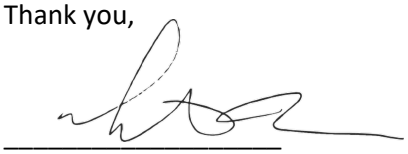
Appendix B - PHARM 616A course description revision_2023– Reviewed by GSPA

Appendix C: PHARM 616B course description revision_2023 – Reviewed by GSPA

Appendix D: Acad_int_workshop_graduate_studies_course_milestone_form

Appendix E: Science - Academic Integrity Workshop - graduate_studies_program_revision_template - Reviewed by GSPA

Thank you,



Martin Ross, PhD, Associate Dean of Science, Graduate Studies

UNIVERSITY OF WATERLOO

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Science

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PHARM

Course number: 601

Course ID: 014939

Course title (max. 100 characters including spaces): MSc Thesis Proposal

Course short title (max. 30 characters including spaces): MSc Thesis Proposal

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Department

Course description:

Current description: The objective of Pharm 601 is to encourage graduate students in the MSc in Pharmacy program to best prepare and present their research objectives in written and oral form. In addition to

the writing and defence of the Thesis Proposal, each student will be required to: a. Attend and complete a scientific writing workshop (90 min class time) that will provide background on literature searching, citation and proper management of references as part of preparation of the Thesis Proposal, and participate in a one-on-one appointment with the Pharmacy Liaison Librarian to discuss research strategies and reinforce academic integrity. The workshop and appointments will be offered each term by the Pharmacy Liaison Librarian. b. Attend two Thesis Proposal defences by other students, prior to the students own oral defence. This course is only available for the first Thesis Proposal taken within the Pharmacy program. If a student is required to fulfill a second Thesis Proposal (for example, if being reassessed for transfer to the PhD) no additional course credit is available. The Thesis Proposal component involves the preparation of a written research proposal and oral defence of the proposal. The intent is to learn how to use the literature to stimulate in-depth thinking about the basis of their thesis research project and to encourage development of their scientific oral presentation skills. The thesis proposal should outline the reasons for undertaking the project, concisely survey the relevant literature, present a detailed description of the methodology to be used and outline any preliminary results acquired at the time of the proposal. The written proposal will be considered by an examination committee that will normally comprise the students Advisory Committee plus an independent Chair who will assume that role for all Thesis Proposals within one academic term. The full Examination Committee will independently grade the written proposal, and separately assign a grade to the oral defence. The simple average of those scores (two per committee member) will be the students grade for the course.

Revised description: This course prepares MSc in Pharmacy students to present their research objectives and proposed methods in written and oral form suitable for an MSc program and involves preparation of a written research proposal and oral defence of the proposal. The written proposal and the oral presentation of the proposal will be considered by an examination committee.

Meet type(s): Seminar Tutorial Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites:

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

To better reflect course content; to allow course content to be updated from time to time without requiring a revision of the course description by removing information that would normally be included in a course syllabus.

Form completed by: Melinda Recchia
Department/School approval date (mm/dd/yy):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/28/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

UNIVERSITY OF WATERLOO

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Science

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PHARM

Course number: 616A

Course ID: 015241

Course title (max. 100 characters including spaces): PhD Thesis Proposal

Course short title (max. 30 characters including spaces): PhD Thesis Proposal

Grading basis: Numerical

Course credit weight: 0.50

Course consent required: Department

Course description:

Current description: The objectives of Pharm 616 are to encourage graduate students in the PhD Pharmacy program to best prepare and present their research objectives in written and oral form. In addition to the writing and defence of the Thesis proposal, each student will be required to: a. Attend and complete a

scientific writing workshop (90 min class time) that will provide background on literature searching, citation and proper management of references as part of preparation of the Thesis Proposal, and participate in a one-on-one appointment with the Pharmacy liaison librarian to discuss research strategies and reinforce academic integrity. The workshop and appointments will be offered each term by the Pharmacy liaison librarian. b. Attend two Thesis Proposal defences by other students, prior to the student's own oral defence. This course is only available for the first Thesis Proposal taken within the Pharmacy Program. If a student is required to fulfill a second Thesis Proposal (for example, if being assessed for internal transfer from the MSc to PhD program) no additional course credit is available. The Thesis Proposal component involves the preparation of a written research proposal and oral defence of the proposal. The intent is to learn how to use the literature to stimulate in-depth thinking about the basis of their thesis research project and to encourage development of their scientific oral presentation skills. The thesis proposal should outline the reasons for undertaking the project, concisely survey the relevant literature, present a detailed description of the methodology to be used and outline any preliminary results acquired at the time of the proposal. The written proposal will be considered by an examination committee that will normally comprise the student's Advisory Committee plus an independent Chair who will assume that role for all thesis proposals within one academic term. The full Examination Committee will independently grade the written proposal, and separately assign a grade to the oral defence. The simple average of those scores (two per committee member) will be the student's grade for the course.

Revised description: This course prepares PhD in Pharmacy students to present their research objectives and proposal methods in written and oral form suitable to a PhD program and involves the preparation of a written research proposal and oral defence of the proposal. The written and oral proposal will be considered by an examination committee that normally includes the student's Thesis Advisory Committee plus an independent Chair. This course is only available for the first Thesis Proposal taken within the Pharmacy Program.

Meet type(s): Seminar Tutorial Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Anti-requisites: PHARM 601

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

To better reflect course content; to allow course content to be updated from time to time without requiring a revision of the course description by removing information that would normally be included in a course syllabus.

Form completed by: Melinda Recchia
Department/School approval date (mm/dd/yy):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/28/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

UNIVERSITY OF WATERLOO

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Science

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☐ Inactivate: Choose an item.

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☒ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Updating the Course description.

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: PHARM

Course number: 616B

Course ID: 016246

Course title (max. 100 characters including spaces): PhD Thesis Proposal

Course short title (max. 30 characters including spaces): PhD Thesis Proposal

Grading basis: Credit/No Credit

Course credit weight: 0.00

Course consent required: Department

Course description:

Current description: The objectives of Pharm 616 are to encourage graduate students in the PhD Pharmacy program to best prepare and present their research objectives in written and oral form. In addition to

the writing and defence of the Thesis proposal, each student will be required to: a) Attend and complete a scientific writing workshop (90 min class time) that will provide background on literature searching, citation and proper management of references as part of preparation of the Thesis Proposal, and participate in a one-on-one appointment with the Pharmacy liaison librarian to discuss research strategies and reinforce academic integrity. The workshop and appointments will be offered each term by the Pharmacy liaison librarian. b) Attend two Thesis Proposal defences by other students, prior to the student's own oral defence. This course is only available for the first Thesis Proposal taken within the Pharmacy Program. If a student is required to fulfill a second Thesis Proposal (for example, if being assessed for internal transfer from the MSc to PhD program) no additional course credit is available. The Thesis Proposal component involves the preparation of a written research proposal and oral defence of the proposal. The intent is to learn how to use the literature to stimulate in-depth thinking about the basis of their thesis research project and to encourage development of their scientific oral presentation skills. The thesis proposal should outline the reasons for undertaking the project, concisely survey the relevant literature, present a detailed description of the methodology to be used and outline any preliminary results acquired at the time of the proposal. The written proposal will be considered by an examination committee that will normally comprise the student's Advisory Committee plus an independent Chair who will assume that role for all thesis proposals within one academic term. The full Examination Committee will independently grade the written proposal, and separately assign a grade to the oral defence. The simple average of those scores (two per committee member) will be the student's grade for the course.

Revised description: This course prepares PhD in Pharmacy students to present their research objectives and proposal methods in written and oral form suitable to a PhD program. The written and oral proposal will be considered by an examination committee that normally includes the student's Thesis Advisory Committee plus an independent Chair. This course is for students who previously completed Pharm 601 in their MSc in Pharmacy program and are required to fulfill a second Thesis Proposal where no additional course credit is available.

Meet type(s): Seminar Tutorial Choose an item. Choose an item.

Primary meet type: Seminar

Delivery mode: On-campus

Requisites: Prerequisite: PHARM 601

Special topics course: Yes ☐ No ☒

Cross-listed course: Yes ☐ No ☒

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:

To better reflect course content; to allow course content to be updated from time to time without requiring a revision of the course description by removing information that would normally be included in a course syllabus.

Form completed by: Melinda Recchia
Department/School approval date (mm/dd/yy):
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/28/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

UNIVERSITY OF WATERLOO

Senate Graduate & Research Council
Graduate Studies Course/Milestone Form

Prior to form submission, review the content revision instructions. For questions about the form submission, contact Trevor Clews, Graduate Studies and Postdoctoral Affairs (GSPA).

Faculty: Science

Effective date: Term: Spring Year: 2023

Milestone

Note: milestone changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Choose an item.

☒ Inactivate: Academic Integrity Workshop

☐ Revise: from Choose an item. to Choose an item.

Course

Note: some course changes also require the completion/submission of the Graduate Studies Program Revision Template.

☐ New: Complete all course elements below

☐ Inactivate: Complete the following course elements:
Course subject code, Course number, Course ID, Course title

☐ Revise: Complete all course elements below to reflect the proposed change(s) and identify the course elements being revised (*e.g. Course description, Course title*):

Course elements (complete as indicated above. Review the glossary of terms for details on course elements)

Course subject code: Choose an item.

Course number:

Course ID:

Course title (max. 100 characters including spaces):

Course short title (max. 30 characters including spaces):

Grading basis: Choose an item.

Course credit weight: Choose an item.

Course consent required: Choose an item.

Course description:

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

Primary meet type: Choose an item.

Delivery mode: Choose an item.

Requisites:

Special topics course: Yes ☐ No ☐

Cross-listed course: Yes ☐ No ☐

Course subject code(s) and number(s) to be cross-listed with and approval status:

Sections combined/held with:

Rationale for request:
The Office of Academic Integrity and the Library have worked together to refresh the mandatory Graduate Academic Integrity Module (Graduate AIM) in Learn. The module is now quite robust, with all required information covered in its content. The Faculty of Science mandatory Academic Integrity Workshop is rendered redundant as a result, and we would like to have that milestone removed

Form completed by: Martin Ross
Department/School approval date (mm/dd/yy): 02/16/23
Reviewed by GSPA (for GSPA use only) ☐ date (mm/dd/yy):
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):

UNIVERSITY OF WATERLOO

Graduate Studies
Program Revision Template

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

Faculty: Science

Programs:

1. Accelerated Doctoral Program in Physics
2. Doctor of Philosophy (PhD) in Biology
3. Doctor of Philosophy (PhD) in Biology - Water
4. Doctor of Philosophy (PhD) in Chemistry
5. Doctor of Philosophy (PhD) in Chemistry - Co-operative Program
6. Doctor of Philosophy (PhD) in Chemistry - Nanotechnology
7. Doctor of Philosophy (PhD) in Chemistry - Quantum Information
8. Doctor of Philosophy (PhD) in Earth Sciences
9. Doctor of Philosophy (PhD) in Earth Sciences - Water
10. Doctor of Philosophy (PhD) in Pharmacy
11. Doctor of Philosophy (PhD) in Physics
12. Doctor of Philosophy (PhD) in Physics - Nanotechnology
13. Doctor of Philosophy (PhD) in Physics - Quantum Information
14. Doctor of Philosophy (PhD) in Vision Science
15. Doctor of Philosophy (PhD) in Vision Science - Aeronautics
16. Master of Pharmacy (MPharm) in Advanced Pharmacy Practice
17. Master of Science (MSc) in Biology
18. Master of Science (MSc) in Biology - Water
19. Master of Science (MSc) in Chemistry
20. Master of Science (MSc) in Chemistry - Co-operative Program
21. Master of Science (MSc) in Chemistry - Nanotechnology
22. Master of Science (MSc) in Chemistry - Quantum Information
23. Master of Science (MSc) in Earth Sciences
24. Master of Science (MSc) in Earth Sciences - Water
25. Master of Science (MSc) in Physics
26. Master of Science (MSc) in Physics - Nanotechnology
27. Master of Science (MSc) in Physics - Quantum Information
28. Master of Science (MSc) in Pharmacy
29. Master of Science (MSc) in Vision Science
30. Master of Science (MSc) in Vision Science - Aeronautics

Program contact name(s): Martin Ross, Agnes Kolic

Form completed by: Martin Ross and Trevor Clews

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Removing the "Academic Integrity Workshop" milestone and any related milestone descriptions from the degree requirements for all the graduate programs within the Faculty of Science.

Is this a major modification to the program? No

Rationale for change(s):

The Office of Academic Integrity and the Library have worked together to refresh the mandatory Graduate Academic Integrity Module (Graduate AIM) in Learn. The module is now quite robust, with all required information covered in its content. The Faculty of Science mandatory Academic Integrity Workshop is rendered redundant as a result, and we would like to have that milestone removed.

Proposed effective date: Term: Spring Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/science

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
~~*Academic Integrity Workshop*~~	*N/A*

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

Students who are currently registered (prior to Spring 2023) will still have to complete the Academic Integrity Workshop milestone (as well as the Graduate AIM). Students who begin graduate studies after Spring 2023 will no longer have to complete the mandatory Science Academic Integrity Workshop, and will simply take the Graduate Academic Integrity Module, which essentially covers the same content. We imposed both in the past because the Graduate AIM was not as thorough as our workshop. With the substantial improvements to the module in Learn, students will simply be directed to that module as their Academic Integrity requirement. This will simplify and streamline their obligations regarding Academic Integrity training.

Department/School approval date (mm/dd/yy): 02/16/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 03/01/23
Faculty approval date (mm/dd/yy):
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

UNIVERSITY OF WATERLOO
FACULTY OF ENGINEERING

M E M O

TO: Kathy Winter, Assistant University Secretary & Privacy Officer Secretariat

FROM: S. Sivoththaman, Associate Dean, Graduate Studies, Faculty of Engineering

RE: Senate Graduate and Research Council

DATE: March 27, 2023

Please place the following motions forward for approval at the next meeting of the SGRC. These changes were approved by the EFC on March 21, 2023.

Items for Approval:

These items for consideration on SGRC Regular Agenda

1. The department of **Mechanical and Mechatronics Engineering** would like to make the following calendar changes
   a. Addition of direct entry Co-operative program to the MEng MME program.
   b. Discontinuation of the Type 2 Graduate Diploma in Design Engineering and Graduate Diploma in Design Engineering – Co-operative Program.

Rationale for Request:

a. The direct entry co-op MEng program aligns with the University's and Province's vision and policy on "Work Integrated Learning" (WIL). The new program will allow the selected MEng students to apply their knowledge gained in their coursework and reinforce their professional development. It also builds upon the success of the GDip in Design Engineering with co-op available in the Department of Mechanical and Mechatronics Engineering (MME) that will be discontinued in Fall 2023. The new MEng program will offer co-op opportunities to a wider group of MEng students.
   The new program will be highly selective to maintain high quality and reputation among employers. Initially, the program capacity will be limited to 20 students distributed over the three terms. The program capacity will be reviewed yearly based on the number of placements/work experiences, types of jobs and employers' evaluations. In the event of a student not finding a co-op work experience, the student may transfer to the regular MEng without co-op.
   MME has collected feedback from their graduate students through different surveys and informal discussions. Access to co-op and better preparation for the job market are regular requests from MEng students. Thus, the new program will respond to the student desire of WIL in their MEng.
   This direct entry co-op MEng program will attract the best applicants to the MEng program in MME including domestic students who graduated from a program without co-op in Canada.

International students will be able to take co-op jobs without impacting their Post Graduate Work Permit (PGWP).
The co-op program/option will be supported by Co-operative Education. Attached is the Feasibility Report that was completed by Co-operative Education.

b. The GDip in Design Engineering and GDip in Design Engineering - Co-operative Program have relied on the availability of one faculty member with unique expertise in design, responsible for selecting students and teaching the three core courses (ME 680, ME 681 and ME 682). This faculty member is retiring in July 2023. The Department of Mechanical and Mechatronics Engineering does not have adequate teaching resources to continue the GDip in the same mode of operation and there is no plan in the short-term of hiring a new faculty member capable of teaching ME 680, ME 681 and ME 682 on a regular basis.
Further, the Department of Mechanical and Mechatronics Engineering is in the process of restructuring its MEng program with new graduate specializations and a direct entry co-op option that will offer alternatives to applicants interested in mechanical and mechatronics engineering MEng and co-op.

2. As per the **Collaborative Nanotechnology Program's** guidelines, the course changes in this motion have been approved by all six member departments of the program:

a. Removing the following courses from the graduate academic calendar
    i. Topics within Nano 701 (Fundamentals of Nanotechnology)
    ii. Topics within Nano 702 (Nanotechnology Tools)
b. Addition of new course NANO 707 (From Atoms to Crystals, Quantum Wells, Wires and Dots) to the Nanotechnology program
c. Adding NANO 707 to the list of Nanotechnology core courses, which are a component of the Nanotechnology collaborative program.

Rationale for Request:

a. These courses were previously inactivated when they were replaced by the NANO 600 series of courses and no longer meet core degree requirements for the Nanotechnology Collaborative Graduate programs. However, they were retained in the UW Graduate Studies Calendar pending degree completion by students who may have taken them as part of their degree requirements. They should no longer appear, per former approval that they will not be offered in the future. Note: This will remove them from the current calendar (as they are no longer available) but they will be retained in the calendar archive for anyone who took them.
b. NANO 701 and 702 topic courses are being inactivated due to the approval of regularly offered NANO 600 level courses. The proposed NANO 707 course combines the content of NANO 701 topics 02 and 14. Dedicated NANO core course modules will be more advantageous when delivered as full-term, 0.50 credit weight courses.
c. NANO 707 will be offered with a credit weight of 0.50, thereby increasing the number of core courses offered in the Nanotechnology Collaborative Graduate programs list of approved courses. This course is a blend of NANO 701: T02 (Solid State Physcs&Chemistry) and T14 (From Atoms to Crystals), previously offered as technical electives with course credit weights of 0.25.

3. The department of **Chemical Engineering** would like to make the following calendar changes

a. Addition of a new course CHE 603 (Chemical Engineering Thermodynamics) to the Chemical Engineering program

Rationale for Request:

a. This course is being proposed in direct response to the external assessment and self-study of the CHE graduate program conducted in 2017. As a result of this process, the Department committed to "offer a course in Thermodynamics. The exact timing of the first offering depends on resource availability, but the Department is aiming to deliver the course in 2019." Chemical Engineering Thermodynamics is a foundational part of a CHE curriculum, as is reflected by all Canadian CHE graduate programs offering a similar course except for UW's department. The introduction of this course will correct this issue and significantly improve the rigor of the CHE graduate program.

4. The department of **Systems Design Engineering** would like to make the following calendar changes
    a. Update the Master's Thesis Examining Committee requirements for all MASc in SYDE programs, this includes the MASc, MASc Nanotechnology, and MASc Aeronautics to reflect the interdisciplinary nature of the program.

Rationale for Request:

a. Systems Design Engineering is a department which prides itself on the interdisciplinary and diverse nature of its researchers. To ensure students receive feedback that encourages this interdisciplinary mindset, it is important that students' thesis committees include members from outside the Department of Systems Design Engineering.

5. The department of **Electrical and Computer Engineering** would like to make the following calendar changes
    a. Regarding the MEng specialization in Sustainable Energy: Remove ECE 663 (Energy Processing) from the list of compulsory courses and add it to the list of elective courses.

Rationale for Request:

a. Provides M.Eng. students seeking this specialization more flexibility to choose their electives

SS/em

Graduate Studies
Program Revision Template

This item for consideration on SGRC Regular Agenda

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

Faculty: Engineering

Program: Master of Engineering (MEng) in Mechanical and Mechatronics Engineering – Co-operative Program

Program contact name(s): Cecile Devaud

Form completed by: Cecile Devaud

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Adding a direct entry Co-operative program/option to the MEng in Mechanical and Mechatronics Engineering program.

Is this a major modification to the program? Yes

Rationale for change(s):

The direct entry co-op MEng program aligns with the University's and Province's vision and policy on "Work Integrated Learning" (WIL). The new program will allow the selected MEng students to apply their knowledge gained in their coursework and reinforce their professional development. It also builds upon the success of the GDip in Design Engineering with co-op available in the Department of Mechanical and Mechatronics Engineering (MME) that will be discontinued in Fall 2023. The new MEng program will offer co-op opportunities to a wider group of MEng students.

The new program will be highly selective to maintain high quality and reputation among employers. Initially, the program capacity will be limited to 20 students distributed over the three terms. The program capacity will be reviewed yearly based on the number of placements/work experiences, types of jobs and employers' evaluations. In the event of a student not finding a co-op work experience, the student may transfer to the regular MEng without co-op.

MME has collected feedback from their graduate students through different surveys and informal discussions. Access to co-op and better preparation for the job market are regular requests from MEng students. Thus, the new program will respond to the student desire of WIL in their MEng.

This direct entry co-op MEng program will attract the best applicants to the MEng program in MME including domestic students who graduated from a program without co-op in Canada. International students will be able to take co-op jobs without impacting their Post Graduate Work Permit (PGWP).

The co-op program/option will be supported by Co-operative Education. Attached is the Feasibility Report that was completed by Co-operative Education.

Proposed effective date: Term: Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-mechanical-and-mechatronics-engineering

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:

MASTER OF ENGINEERING (MENG) IN MECHANICAL AND MECHATRONICS ENGINEERING
 	
Graduate specializations
 	
• Green Energy
 	
Program information
 	
• **Admit term(s)**
  ○ Fall
  ○ Winter
  ○ Spring
 	
• **Delivery mode**
  ○ On-campus
 	
• **Length of program**
  ○ Full-time: 4 terms (16 months)
  ○ Part-time: 8 terms (32 months)
 	
• **Program type**
  ○ Master's
  ○ Professional
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Coursework
 	
• **Additional program information**
  ○ The University of Waterloo does not provide funding for MEng in Mechanical and Mechatronics Engineering students, and the candidates are expected to be self-supporting.
 	
Admission requirements
	MASTER OF ENGINEERING (MENG) IN MECHANICAL AND MECHATRONICS ENGINEERING - CO-OPERATIVE PROGRAM
	
	Graduate specializations
	
	• Green Energy
	
	Program information
	
	• **Admit term(s)**
	  ○ Fall
	  ○ Winter
	  ○ Spring
	
	• **Delivery mode**
	  ○ On-campus
	
	• **Length of program**
	  ○ Full-time: 5-6 terms (20-24 months)
	
	• **Program type**
	  ○ Co-operative
	  ○ Master's
	  ○ Professional
	
	• **Registration option(s)**
	  ○ Full-time
	
	• **Study option(s)**
	  ○ Coursework
	
	• **Additional program information**
	  ○ The University of Waterloo does not provide funding for MEng in Mechanical and Mechatronics Engineering students, and the candidates are expected to be self-supporting.
	
	Admission requirements

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:

• **Minimum requirements**
  ○ The Department of Mechanical and Mechatronics Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada.
  ○ Graduate Record Examination (GRE) test scores (requirement only for applicants who completed their undergraduate degree from an institution located outside of Canada or the United States of America).
 	
• **Application materials**
  ○ Résumé
  ○ Supplementary information form
  ○ Transcript(s)
 	
• **References**
  ○ Number of references: 2
  ○ Type of references: academic
 	
• **English language proficiency (ELP)** (if applicable)
	• **Minimum requirements**
	  ○ The Department of Mechanical and Mechatronics Engineering requires either (i) a 75% overall standing in the last two years, or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent or (ii) a 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent, as the minimum requirement for admission to a Master's program for applicants educated at a Canadian institution. A 75% overall standing or equivalent, in a relevant four-year Honours Bachelor's degree or equivalent is the minimum requirement for admission to a Master's program for applicants educated outside of Canada.
	  ○ Graduate Record Examination (GRE) test scores (requirement only for applicants who completed their undergraduate degree from an institution located outside of Canada or the United States of America).
	
	• **Application materials**
	  ○ Résumé
	  ○ Supplementary information form
	  ○ Transcript(s)
	
	• **References**
	  ○ Number of references: 2
	  ○ Type of references: academic
	
	• **English language proficiency (ELP)** (if applicable)

Degree requirements
 	
• **Graduate Academic Integrity Module (Graduate AIM)**
 	
• **Courses**
  ○ Students must complete 8 one-term (0.50 unit weight) graduate level courses (or courses acceptable for graduate credit).
  ○ A maximum of 2 500-level courses may be counted for credit.
	Degree requirements
	
	<u>The MEng in Mechanical and Mechatronics Engineering – Co-operative Program will enable students to combine graduate studies with work experience.</u>
	
	<u>The program includes completion of 1-2 required work terms. The work term(s) typically takes place in term 3 (or terms 3 and 4). The work term(s) must meet CEE standard work term requirements and Departmental requirements. Students should apply to jobs related to their program of study. Note: the program must start and end on an academic term. Students in the</u>

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:
○ An English for Multilingual Speakers (EMLS) technical/professional course is normally required for all students who were not English Language Proficiency (ELP) exempt at the time of admission. This course is normally taken in the first term of the program. ○ The EMLS communication course can be waived at the discretion of the Department. ○ At least 2 out of the 8 required courses must be taken from the following list of ME graduate core courses: ▪ ME 620 Mechanics of Continua ▪ ME 621 Advanced Finite Element Method ▪ ME 631 Mechanical Metallurgy ▪ ME 632 Experimental Methods in Materials Engineering ▪ ME 640 Autonomous Mobile Robotics ▪ ME 649 Control of Machines and Processes ▪ ME 651 Heat Conduction ▪ ME 652 Convective Heat Transfer ▪ ME 653 Radiation Heat Transfer ▪ ME 662 Advanced Fluid Mechanics ▪ ME 664 Turbulent Flow ○ MEng students completing 1 of the 2 Graduate Diploma (GDip) program options or the Graduate Specialization are allowed to use the mandatory courses from the GDips or Graduate Specialization to count toward 2 of the 8 core courses. ○ MEng students must attend at least 4 MME research seminars. ○ Additional Faculty regulations concerning Master's degree requirements are: ▪ The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure). ▪ At least half of the courses used for credit must normally be Faculty of Engineering courses and the other half need to be	<u>program are encouraged to complete COOP 601 Career Success Strategies in the academic term prior to the first work term.</u> • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must complete 8 one-term (0.50 unit weight) graduate level courses (or courses acceptable for graduate credit). ○ A maximum of 2 500-level courses may be counted for credit. ○ An English for Multilingual Speakers (EMLS) technical/professional course is normally required for all students who were not English Language Proficiency (ELP) exempt at the time of admission. This course is normally taken in the first term of the program. ○ The EMLS communication course can be waived at the discretion of the Department. ○ At least 2 out of the 8 required courses must be taken from the following list of ME graduate core courses: ▪ ME 620 Mechanics of Continua ▪ ME 621 Advanced Finite Element Method ▪ ME 631 Mechanical Metallurgy ▪ ME 632 Experimental Methods in Materials Engineering ▪ ME 640 Autonomous Mobile Robotics ▪ ME 649 Control of Machines and Processes ▪ ME 651 Heat Conduction ▪ ME 652 Convective Heat Transfer ▪ ME 653 Radiation Heat Transfer ▪ ME 662 Advanced Fluid Mechanics ▪ ME 664 Turbulent Flow ○ MEng students completing 1 of the 2 Graduate Diploma (GDip) program options or the Graduate Specialization are allowed to use the mandatory courses from the GDips or Graduate Specialization to count toward 2 of the 8 core courses.

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:
Mechanical and Mechatronics Engineering courses. ○ Students in the MEng in Mechanical and Mechatronics Engineering program may choose to pursue the following Graduate Specialization: 1. Green Energy ○ A Graduate Specialization is a University credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. ○ All MEng Graduate Specializations in Mechanical and Mechatronics Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The requirements for the Graduate Specialization are described below. 1. Graduate Specialization in Green Energy ○ To receive the Graduate Specialization in Green Energy, students must successfully complete 1 compulsory course and 3 elective courses: ▪ Compulsory course: ▪ ME 659 Energy and Environment ▪ Elective courses (choose 3 from the following list):	○ MEng students must attend at least 4 MME research seminars. ○ Additional Faculty regulations concerning Master's degree requirements are: ▪ The candidate must obtain a pass in all courses credited to their program, with a minimum overall average of 70% (a grade of less than 65% in any course counts as a failure). ▪ At least half of the courses used for credit must normally be Faculty of Engineering courses and the other half need to be Mechanical and Mechatronics Engineering courses. ○ Students in the MEng in Mechanical and Mechatronics Engineering program may choose to pursue the following Graduate Specialization: 1. Green Energy ○ A Graduate Specialization is a university credential that is recognized on the student's transcript but not on the diploma and is intended to reflect that a student has successfully completed a set of courses that together provide an in-depth study in the area of the Graduate Specialization. A student will only obtain the Graduate Specialization on their transcript if they have completed the requirements associated with the MEng degree and the requirements associated with the Graduate Specialization. ○ All MEng Graduate Specializations in Mechanical and Mechatronics Engineering consist of a set of at least 4 graduate (0.50 weight) level courses and this set is comprised of a mix of compulsory and elective courses. Compulsory courses are those that are prescribed as part of the Graduate Specialization. Elective courses are those that are on a list of courses designated as electives for a given Graduate Specialization. The

Current MEng in Mechanical and Mechatronics Engineering Graduate Studies Academic Calendar content:	**Proposed MEng in Mechanical and Mechatronics Engineering – Co-operative Program Graduate Studies Academic Calendar content**:
▪ ME 738 Special Topics in Materials: Hydrogen Storage Materials ▪ ME 751 Fuel Cell Technology ▪ ME 753 Solar Energy ▪ ME 760 Special Topics in Thermal Engineering: Low Energy Building Systems ▪ ME 760 Special Topics in Thermal Engineering: Building Energy Performance ▪ ME 760 Special Topics in Thermal Engineering: Air Pollution and Greenhouse Gases ▪ ME 760 Special Topics in Thermal Engineering: Wind Energy	requirements for the Graduate Specialization are described below. 1. Graduate Specialization in Green Energy ○ To receive the Graduate Specialization in Green Energy, students must successfully complete 1 compulsory course and 3 elective courses: ▪ Compulsory course: ▪ ME 659 Energy and Environment ▪ Elective courses (choose 3 from the following list): ▪ ME 738 Special Topics in Materials: Hydrogen Storage Materials ▪ ME 751 Fuel Cell Technology ▪ ME 753 Solar Energy ▪ ME 760 Special Topics in Thermal Engineering: Low Energy Building Systems ▪ ME 760 Special Topics in Thermal Engineering: Building Energy Performance ▪ ME 760 Special Topics in Thermal Engineering: Air Pollution and Greenhouse Gases ▪ ME 760 Special Topics in Thermal Engineering: Wind Energy • **Graduate Studies Work Report** ○ Students must complete one or two work-term experiences. For each work experience, a work report must be submitted to the Department for review to earn credit for the work report. ○ Students are responsible for following the roles and responsibilities of Co-operative and Experiential Education (CEE).

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

Students currently enrolled in the MEng in MME program will not be impacted, as this will only be offered to students starting in Fall 2023.

Department/School approval date (mm/dd/yy): 02/02/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/01/23
Faculty approval date (mm/dd/yy): 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

CO-OPERATIVE AND EXPERIENTIAL EDUCATION
Co-operative Education
519-888-4026 | ceehub@uwaterloo.ca

Co-operative & Experiential Education (CEE)

Preliminary review

Proposed Program: Master of Engineering, Mechanical and Mechatronics Engineering, Co-operative Education

Program Effective Date: Fall 2023

Requested by: Cecile Devaud, Associate Chair for Graduate Studies, Department of Mechanical and Mechatronics Engineering

Prepared by: Richard Wikkerink, Director, Student & Faculty Relations, Co-operative Education – January 31, 2023

Executive Summary

The Department of Mechanical and Mechatronics Engineering has expressed intent to add a program-level work integrated learning (WIL) experience (co-op) option to their master's program for fall 2023. The co-op components of the degree will be fully administered by Co-operative & Experiential Education (CEE) with the work integrated learning (WIL) component included as a milestone degree requirement. The university has embarked on a Graduate Work Integrated Learning project with graduate co-op requirements and enhanced students support in scope. These new requirements and supports will come into effect in fall 2024.

The Graduate Diploma in Engineering Design has created an existing pattern for job opportunities and program support. Building on this, CEE will utilize existing staff, resources, and co-op processes across the portfolio to support this new program, as it does for other graduate co-op programs in Engineering. CEE will require sufficient time to complete a new program plan and will work with the program in the coming months to address system and records processing needs, WIL programming, and job development opportunities.

An industry and jobs analysis was not included in this report as there was insufficient advanced notice. We have included both an existing analysis (2020) of the Graduate Diploma in Engineering Design and added a summary analysis of undergraduate work terms in the 5th and 6th work term as a starting point. Analysis, completed by CEE, will follow in spring 2023 and encompass all new graduate co-op plans in the Faculty of Engineering.

With the understanding of a cap of 20 students for the 2023-2024 admission cycle (divided between fall, winter and spring) CEE supports in principle the proposed new

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MEng Mechanical and Mechatronics Co-op program and will collaborate with the academic unit on the development and administration of co-op components of the degree.

CEE recommends the Department of Mechanical and Mechatronics (Graduate Studies) consider the following:

- Establish new co-op admission requirements for Fall 2023 so that students may be directly admitted to the program, reducing barriers for international students who are required to obtain a co-op work permit to work in Canada
- Include co-op degree requirements in graduate calendar.
- The co-op sequence is designed to be flexible, within the framework that two terms of study must be completed prior to the first work term and the program ends on a study term
- Review the implications of involvement in co-op as related to items such as, but not limited to, student statuses, funding packages, and scholarships

CEE, with leadership from the designated Faculty Relations Manager, will:

- Complete a labour market and co-op job analysis for MEng programs, sharing this data with the grad job development working group to inform Account Management (AM) and Business Development (BD) activities and targets. The Senior Advisor working with Engineering and Mitacs is included in this group
- Collaborate with the Associate Chair Graduate Studies for Mechanical and Mechatronics Engineering and the Graduate Officer/Coordinator to work through the Co-op Program Plan and in 2024, align with new program requirements and student support model
- Together with the program determine success measures that link the MEng learning outcomes with criteria for co-op success that clarify the expectation for quality work terms

Work-Integrated Learning at UW

Co-operative Education is a form of work integrated learning (WIL), which allows students to apply classroom learning to the workplace and, likewise, connect workplace learning to their degree and areas of specialization. For those students who are seeking a stronger connection between their studies and industry, the University of Waterloo's co-op programs distinguish it amongst Canadian institutions. Furthermore, CEE provides a robust system of support for students (domestic and international visa) seeking work experiences in Canada or internationally.

Benefits go beyond the students. Industry partners benefit by gaining access to a wider range of grad students who bring varied experiences personally, professionally, and academically. All stakeholders will benefit from opportunities for idea exchange and strengthened connection between academic research and innovations in industry.

Introducing a new co-op plan aligns with the strategic focus on GradWIL at an institutional level and will continue to reinforce UW as a WIL leader for both undergraduate and graduate programs.

The key components of a quality WIL experience are pedagogy, experience, assessment and reflection, or P.E.A.R. Making sure all four elements are included in the development of program-level WIL are critical for creating a quality WIL experience.

- Pedagogy – includes the academic course content and the WIL curriculum
- Experience – meaningful and aligned appropriately with the WIL model
- Assessment – including the learning outcomes for the program + Future Ready Talent Framework
- Reflection – on the WIL experience and in alignment with the idea of "purposeful work"

Co-op Program Structure

The MEng Mechanical and Mechatronics Engineering Co-op program, as with other graduate co-op programs, will follow the existing co-op model. All co-op students are responsible for following the procedures, roles and responsibilities of co-op students.

Co-op students are strongly encouraged to complete PD 601 prior to their first co-op work term (typically completed in their Winter term/second study term) prior to the co-op experience and while they apply to jobs concurrently. PD 601 provides information on navigating the co-op employment process, foundational career preparation and teaches students how to prepare professional job search documents. Some graduate programs have positioned PD 601 as a foundational requirement for co-op participation. Students who have already completed similar UW co-op preparation modules (e.g.: PD1 Career

Fundamentals) will not be required to take PD 601. Note: PD 601 is currently going through a major re-development of course content, with an expected launch of Winter 2024.

The Centre for Career Action (CCA) provides career and co-op preparation resources and services (e.g.: resume, cover letter, interview preparation, job search, etc.) for all graduate students. These services are accessed more readily when promoted by the academic program or incorporated into existing courses. Additional collaboration between Mechanical and Mechatronics Engineering, SFR and CCA may be required prior to Fall 2023 to establish how existing services and staff will be utilized.

Co-op work terms must meet standard work term requirements for all graduate students. Mechanical and Mechatronics Engineering students will have access to the co-op job board through WaterlooWorks or may arrange their own employment, externally, which must be approved by CEE. During the experience, graduate students will be supported by Co-op Advisors through site visits, e-check-ins and work term ratings. Employers will evaluate the work performance of students via the Student Performance Evaluation (SPE); a rating of 'satisfactory' or above will grant the student credit for the work term.

To evaluate program effectiveness and WIL outcomes, the CEE Faculty Relations Manager, Engineering, will monitor key metrics annually to ensure program quality.

Master of Engineering Learning Outcomes

The program has indicated that the "success of the program related to co-op would be employment rate and quality of work term position relative to the learning outcomes of the program as well as at the level of a graduate student." Given that there are multiple factors contributing to the measure of quality (e.g., labour market, student experience, engagement, and readiness for the workplace), the department and CE will need to determine the criteria and process to assess the "quality of work term position."

The success of a co-op program can be measured through the learning that occurs on a work term thorough the Future Ready Talent Framework (FRTF) as assessed by the Student Performance Evaluation and the Major Reflective Report. The program may wish to consider mapping MEng learning outcomes and courses to the FRTF for further insight.

Co-op Sequence

Students in MEng Mechanical and Mechatronics Engineering will be required to complete one standard co-op work term following a minimum of two terms of study. CEE strongly recommends that students complete two consecutive co-op work terms in their program structure for a longer immersive work experience. This would meet needs for industry partners, builds on the current G.Dip model and be consistent with other

UW graduate co-op plans. Students will have the flexibility to select either term 3 or term 4 to do their work term, noting that all co-op programs must end on a study term to maximize the integration of classroom and workplace learning.

Co-op sequences will be determined with the program and student at the start of the first term of study, noting relevant deadlines as associated with the PD-601. In graduate programs, we are learning that early engagement in work-search strengthens the work term outcomes. As the program develops a pattern of work term sequences, there would be benefit (student expectations, job development, streamline process) in establishing a common sequence and managing individual modifications to sequences through sequence change processes.

Sample Sequence MEng Mechanical and Mechatronics Engineering Co-op with 2 work terms:

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Direct-entry Study	Study Co-op prep course (PD601)	**Work Term 1**	**Work Term 2**	Study Completion of Work Report	Study*
Direct entry Study	Study	Study Co-op prep course (PD601)	**Work Term** 1	**Work Term 2**	Study Completion of Work Report

Co-op Admissions

Programs seeking to add co-op as an option for their students are strongly encouraged to establish a direct-entry co-op program. There are a range of benefits to this structure, including CEE's ability to forecast earlier the number of students expected to be scheduled for a work term from the program and adjust employer and student-facing resources as necessary. Based on current process, visa students can be considered by Canadian immigration for a co-op work permit along with a student permit, preventing lengthy application processes when a work permit is applied for separately.

Beginning Fall 2023, students will apply and be directly admitted into the MEng Mechanical and Mechatronics Engineering Co-op plan. The academic unit will need to establish a specific process and criteria for admissions into this new program.

Where there is demand for co-op, consideration should be given to the value and intention of a WIL experience, as academic standing is not always an indicator of workplace success. Additionally, graduate students bring a range of personal, professional, and academic experiences and so while the more experienced students may ultimately be successful in finding co-op employment, they arguably may not be the students to benefit most from the WIL experience.

Degree Requirements

Graduate students completing the Co-operative education degree requirements will receive a "Co-operative Education" degree designation. These requirements include the following:

- Complete a minimum of one standard co-op work term and receive a Student Performance Evaluation of "marginal" or better
- Complete a work report/reflection requirement administered by the academic department

Note: as part of the GradWIL project, and in alignment with quality WIL standards, work is underway to enhance the graduate student co-op experience over the next two years. This includes the re-development of the co-op preparation course (PD 601) and the creation of a major reflective report post-experience. Graduate co-op programs should anticipate future calendar changes including additional co-op degree requirements for their students.

Graduate Student Support

The Centre for Career Action (CCA) is located in the Tatham Centre at the Waterloo campus and provides support to undergrad and grad students (whether in co-op or not), alumni and staff with co-op and career planning and preparation. Existing services include 1:1 appointments for resumes, cover letters, interview skills, work search, career planning and others, 1:1 drop-ins, workshops, both on and offline resources and supports all offered through a dedicated team of existing co-op and career staff.

Mechanical and Mechatronics Engineering graduate co-op students will be assigned to a team of Career Advisors who provide answers to co-op related questions as well as support throughout the co-op recruitment process. Once students secure a work term, they are offered additional support via a dedicated co-op Student Advisor who is available throughout the term, and provides a work term consultation and reviews e-check-ins.

Job Development

A more extensive Program Plan (feasibility study) will be completed in the Spring and will review the labour market, job demands, and areas for business development. With the newly established graduate job development working group in CEE, there is additional focus on strategies to develop jobs that are meaningful for the learning of graduate co-op students.

Building on the success of the co-op option in the Graduate Diploma in Engineering Design program, we feel that the typical lead time needed to develop jobs will be shortened. With strong connections into associated industries, CEE will actively develop a range of suitable opportunities for graduate students and monitor impact jobs available for senior undergraduate MME students.

As a course-based program with many pathways, marketing these students to employers may be challenging given the more specialized and focused areas of expertise and knowledge graduate students bring. Best efforts will be made to support graduate students in their job search – for example, CEE and Engineering have proactively been engaged with Mitacs and the funding they have access to for WIL at the graduate level. Existing services and expertise in CCA will be leveraged to support students in their job search, noting that the new program plan will examine the resources required to provide these supports.

Note: Given the evolving landscape of graduate co-op in the Faculty of Engineering, and in anticipation of more programs coming forward to include a co-op option, CEE will complete an industry and job analysis in Spring 2023. This report will consider all existing and new Master of Engineering co-op programs and will inform job development strategies for the growing numbers of students in these plans.

Additional Considerations
Graduate WIL

CEE and the GSPA, along with the faculties are undergoing a multi-unit, multi-year project to expand WIL offerings at the graduate level and enhance CEE co-op programming, support, and processes for graduate students. Therefore, graduate co-op will undergo several changes over the coming years which will impact existing programming, support, and job development efforts for graduate students.

Student Status and Fees

Graduate co-op students have their term status changed to co-op and pay a co-op fee during employed co-op work terms. Participation in graduate co-op may have implications for student statuses, funding packages and scholarships. The program will need to investigate further and make students aware of this.

International Students and Work Experiences

The CEE international team will support work terms held outside of Canada, adhering to UW and Global Affairs Canada (GAC) travel polices and advisories.

Students studying on a visa must obtain a co-op work permit in order to find employment for a co-op work term. Applying for a co-op work permit in Canada can take several months, with recent processing times taking at least six months. Direct admissions to the co-op program, allowing CEE to identify co-op students as early as possible, allows students to apply earlier and avoid delaying co-op employment.

Equity

Equity is an important component to consider within a competitive admissions and co-op process. For example, international students may encounter additional barriers such as: varying levels and types of work experience of incoming students, potential for travel restrictions, as well as the complexities of obtaining funding and/or security clearance that may be required for some roles can often be a disadvantage to international students and can delay or impact work term opportunities.

Co-op Program Plan

Following all levels of academic program approval for this new program and before the first term of admission, a Co-op Program Plan will be required. The Co-op Program Plan is a checklist of information, records, system, communications, etc., that ensure CEE administered co-op plans are set-up appropriately and necessary decisions are made. This is a collaborative activity led by a designated Faculty Relations Manager and the academic unit.

Overview of core data from the MME UG program:
MME Graduate students have different experiences and skills than UG students and job competition between UG and Graduate students will be present but mitigated by business development strategies to market the graduate student skill set to industry partners. A more complete analysis will be completed by the end of May 2023.

1. Spring work terms have the highest number of senior students scheduled out (figure 1)
2. Analysis of employers (figure 2) that hire senior UG students demonstrates a wide array of employers, with a balance of a few large employers and many employers who regularly hire smaller numbers of students
3. The main co-op job board provides employment for the majority of senior UG MME students – there is a healthy balance of students who return to a former employer and those who arrange their own job. We have noted that many employers in the AOJ have connections to the UW Co-op program.

Figure 1

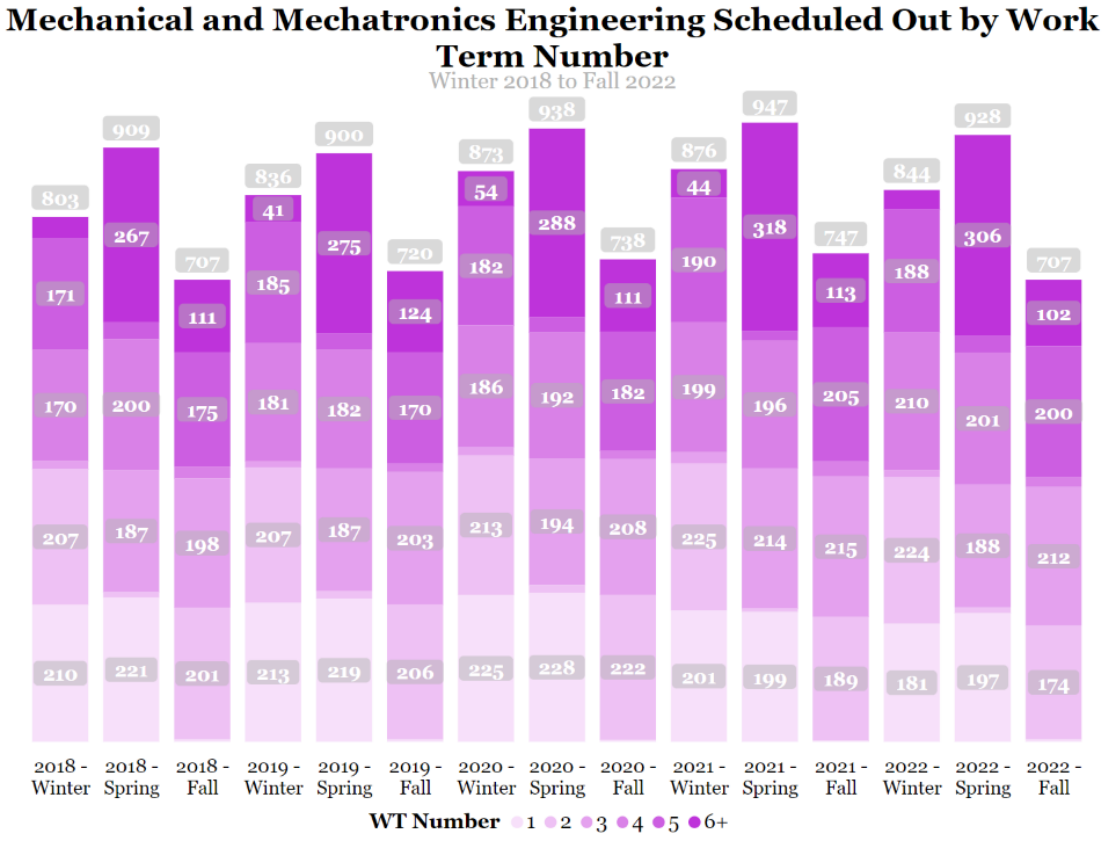


Figure 2

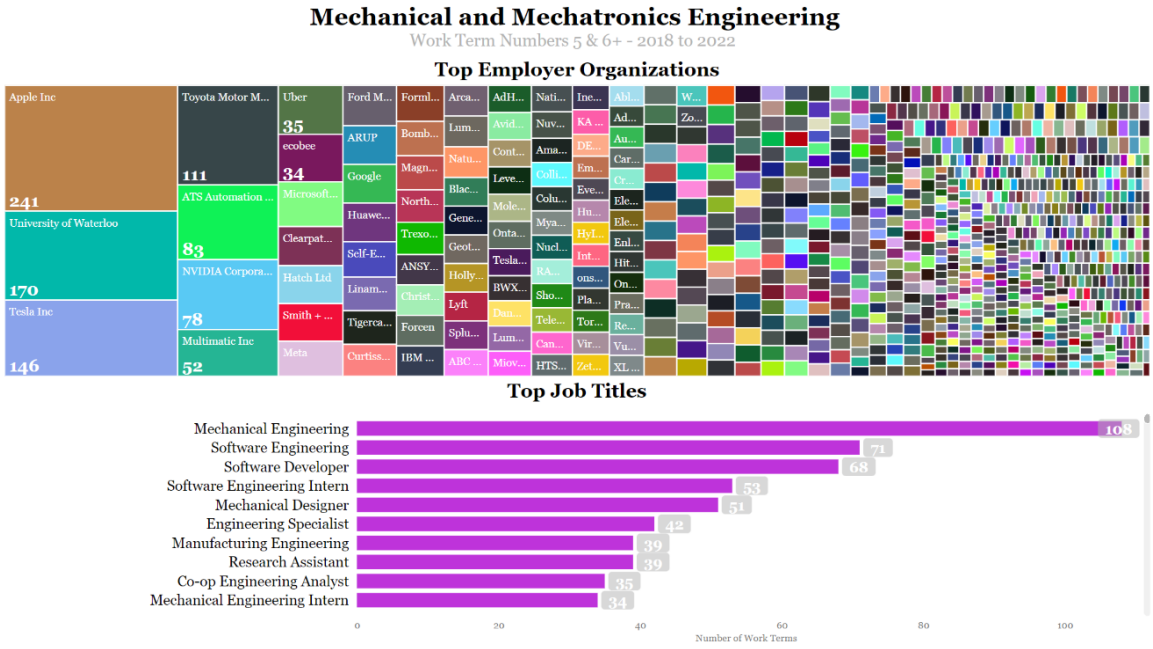
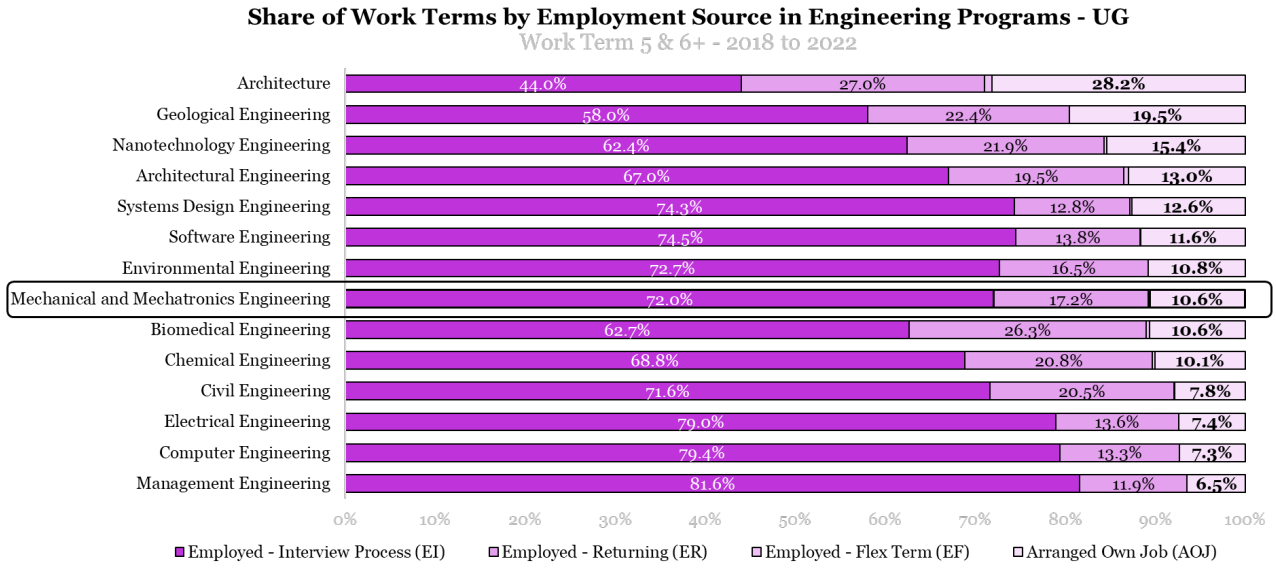


Figure 3



Program Review for Graduate Diploma in Engineering Design

Time period: January 2017 – December 2020

Prepared by: Phil Bezaire, Faculty Relations Manager – Engineering, Co-operative Education, University of Waterloo

Executive Summary

In 2017, the Mechanical and Mechatronics Engineering Graduate Diploma in Engineering Design (GDip) introduced an integrated, co-operative education option to eligible students. This report outlines four years of data, from 2017-2020, representing GDip students' experiences throughout co-op recruitment and employment.

Employment Trends

The GDip program has seen relatively steady enrolment in co-op over the review period, excepting one unusually large cohort in 2018. During this time, GDip has maintained employment rates of 100% in every year except 2020, in which job prospects were significantly depressed due to the global COVID-19 pandemic. GDip students are employed in a variety of organizations and roles, signifying the broad appeal and skillsets that students bring to their co-op work terms. It is noted, however, that nearly half of positions are within the manufacturing sector alone; diversification of jobs across multiple industries could help ensure continued stability of employment prospects.

Student Performance and Satisfaction

GDip students students receive very high performance ratings from their employers, although they score somewhat fewer 'Outstanding' work term evaluations when compared to other Engineering programs. GDip students report a very high level of overall satisfaction with their experience, exceeding Faculty averages across all Rate My Work Term indices. Further investigation may help reveal the primary drivers of student satisfaction, which in turn may enable the development of strategies to improve satisfaction across all programs.

Academic Integration

With regards to program integration, it is critical that students see individual program staff and faculty members as co-op champions. Demonstrating an understanding of the process/timing for co-op recruitment activities, awareness of the time commitment required as well as helping students draw out their strengths and relevant skills are significant drivers in enhancing student experience and success. Moving forward, Co-operative Education will be actively working on deepening engagement with students, and hopes to partner with departments in encouraging their students to connect their workplace experiences and talent development to course-based learning. Supporting students in bringing their workplace learning into their courses, and their course-based learning into their work terms, is a fundamental aspect of strengthening our co-op programs at the University of Waterloo.

Co-operative Education will continue to work with the Mechanical & Mechatronics Engineering department to support GDip students in attaining and excelling in rewarding work experiences

throughout their studies at the University of Waterloo. Co-operative Education continues to seek student feedback and find opportunities to engage students throughout their co-op experience.

Co-operative Education at UW

Co-operative education is an educational model that formally integrates academic studies with relevant work experience. Co-op students alternate terms of school with terms of paid employment in relevant fields; 4-months of study followed by 4-months of work.

Academic learning is shared/applied on the job and work experience is shared/applied in the classroom. Genuine work experience in and of itself provides workplace and professional skills and knowledge development that is different from, yet complementary to, that learned from the academic learning experience.

Graduate co-op students complete up to eight months of work experience which better positions students for their transition to either full-time employment, or further post-secondary pursuits. The co-op model allows students opportunity to test-drive and determine their best career fit as they progress throughout their undergraduate or graduate degree.

University of Waterloo's (UW) Advantage:

- **Largest** in the world >> 22,000+ students in more than 120 programs of study
- **World class** experience >> students work in nearly 60 countries
- **Competitive** employment process >> not a 'placement'
- **Mandatory career preparation** programs >> 10+ job-skill development courses
- **Performance evaluation** at the conclusion of each job >> high incentive to perform well
- **Critical thinking** >> written work reports explore links between academic study and the workplace

Co-op Employment Process

Waterloo's co-op employment process is highly competitive; students apply for jobs they feel suit their skills and interests and then participate in an open interview process when selected by an employer.

Students and employers rank one another based on preference and a computer algorithm matches students to jobs.

Students are also encouraged to pursue their own employment and career interests, and are frequently able to turn these opportunities into credit-worthy co-op work terms.

Value to Employers:

- Hire with flexibility
- Fill immediate needs quickly
- Talent management strategy to find full time employees after graduation
- Low risk and cost-effective hiring
- Contribute to building country's talent pool

Employer Commitment:

- Provide students with worthwhile work
- Pay students
- Provide effective supervision, coaching and evaluation
- Participate in the employment process with integrity
- Promote co-op within company and to other employers

Value to Students:

- Enhance learning
- Evaluate career options
- Accumulate up to 2 years work experience
- Help finance education
- Build a network of professional contacts

Student Commitment:

- Balance the job search with academics
- Pay a co-op fee
- Meet employer expectations
- Respond to the demands of the work force
- Participate with integrity

Value to Institution:

- Makes the institution more attractive and affordable to students
- Attracts highly motivated students
- Drives more relevant curriculum
- Facilitates transfer of knowledge between the workplace and the classroom
- Builds a network of business and industry contacts that may be leveraged in areas such as research, development and advancement

Institution Commitment:

- Resources (cost and talent)
- Provide academic credit for work experience
- Value work experience in the classroom
- Hire students
- Teach classes year-round to accommodate work terms
- Promote to business, government, etc.

Program Background

The Graduate Diploma in Engineering Design (GDip) launched a co-op option in 2017, enabling eligible students to participate in a co-op work term. This option helped to formalize existing work-integrated learning experiences that had been a part of the GDip since its inception, while expanding student access to the Co-operative Education employer base.

Co-op Requirements

In parallel with completing co-op work terms, co-op plans have additional degree requirements to enhance work-integrated learning. Specifically, GDip students must also complete a work term report / case study as part of their co-op experience. This requirement is considered academic in

nature; responsibility for outlining criteria and tracking successful completion rests with the Mechanical and Mechatronics Engineering department.

While work reports may take many forms, they give students the opportunity to reflect on the connection between their academic studies and their work experiences. These reports should demonstrate evidence of critical analysis, good organization, clarity, and conciseness. In preparing work reports, students are able to work on presentation skills, forming arguments, developing and applying evaluation criteria, and performing quantitative analysis, and in the process, create a permanent record of their work. Well-researched, organized, and documented work reports will have a positive impact on students' careers.

Academic/Work Term Sequencing

The GDip program offers a single work term, most commonly completed during the Spring term. In some cases, however, students are permitted to complete their work term in the Winter, as shown below. In rare cases, students can be given special permission to extend an arranged work term into a second semester so to complete 8 months of work consecutively, but such cases are considered exceptional and require approval from both Co-operative Education and the GDip program.

Plan	Year One			Year Two		
	Fall	Winter	Spring	Fall	Winter	Spring
GDip – ENG Design Stream 4	Academic Term	**Work Term**	Academic Term	Academic Term	-	-
GDip – ENG Design Stream 8	Academic Term	Academic Term	**Work Term**	Academic Term	-	-

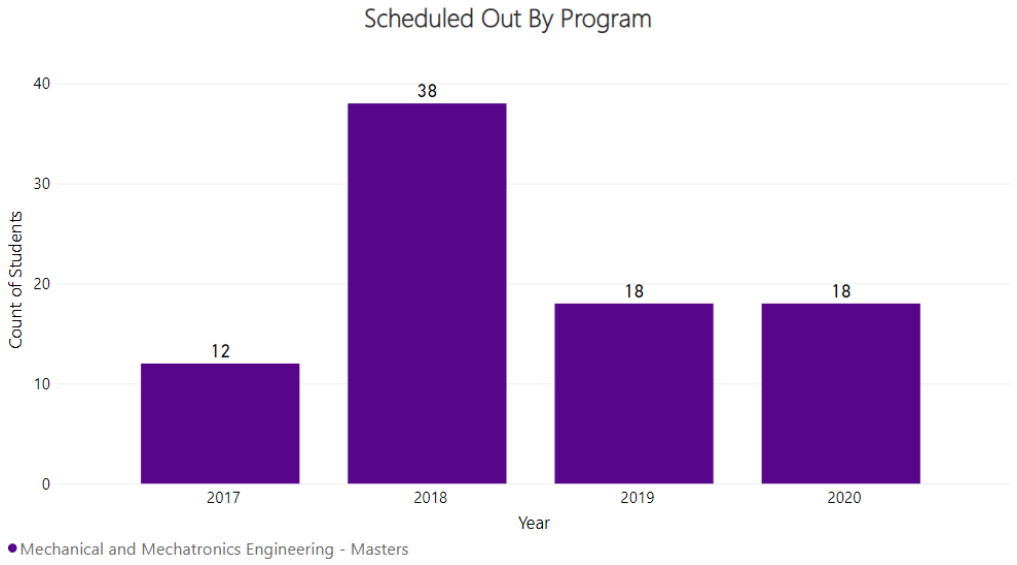
Salary Information

Figures in the table below represent the hourly earnings reported by co-op students on work terms for the Faculty of Engineering in 2019, including all undergraduate and graduate programs. Typically graduate co-op students earn a salary aligning with more senior undergraduate experiences, consistent with Work Terms 4 – 6 in the table below. Co-operative Education does not establish or recommend pay level for co-op students.

Engineering	Work Term 1	Work Term 2	Work Term 3	Work Term 4	Work Term 5	Work Term 6
Average	$17.62	$19.66	$21.16	$22.83	$24.13	$25.02
Range	$14.00 - $27.00	$14.00 - $33.00	$14.00 - $34.00	$14.00 - $35.00	$14.00 - $38.00	$14.00 - $38.00

Students Scheduled Out for Co-op Work Terms

The number of GDip students scheduled out has been relatively consistent, excepting a significantly larger cohort in 2018. Enrolment into the co-op option is managed exclusively by the GDip program, and a variety of factors can impact co-op participation, including applicant quality, the job market, internal enrolment limits, or even co-op success. It is noted that co-op students who are unsuccessful in securing employment on a scheduled work term may choose to revert to the regular, or non-co-op program option; doing so would remove them from scheduled out counts.



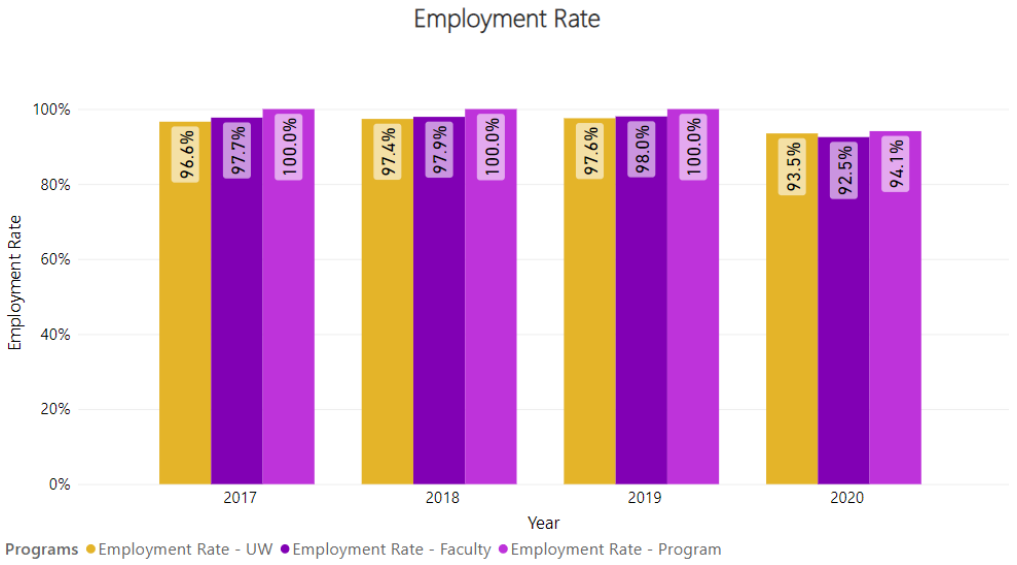
Employment Overview

Many factors influence employment rates, including:

- Availability of suitable employment opportunities (e.g., economic pressures, number of students enrolled versus number of job openings, employer recruitment strategies, etc.);
- Active engagement by students in the application process;
- Experience of students seeking employment (e.g., graduate students may, or may not have prior professional experience);
- Realistic pursuit of available openings (i.e., students apply to jobs for which they have the appropriate skill sets); and/or,
- Flexible pursuit of available openings (i.e. students submit their applications to a geographically diverse and varied set of employers to capitalize on every available opportunity).

Program Employment Rates

The following graph illustrates the yearly employment rates for students in the GDip program, Faculty of Engineering, and UW students over the past 4 years. During this period GDip averaged an employment rate of 98.8% while the Faculty of Engineering averaged an employment rate of 96.4%. Even in the early stages of the COVID-19 pandemic in 2020, GDip students were successful in finding employment at a higher rate than average.



Employment Rates/Methods Commentary

The following graph illustrates a different way of observing the various employment methods students may use to secure employment:

- EI = Employed - Interview Process (secured employment through the campus co-op recruitment process)
- EJ = Employed - Jointly Arranged (secured employment externally with the assistance of Co-operative Education)
- ER = Employed - Returning to Previous Employer (returned to a previous co-op employer)
- ES = Employed - Student Arranged (secured employment externally without the assistance of Co-operative Education)
- UI = Unemployed - Interview Process (did not secure employment via the campus recruitment process)

Students most often prefer to seek and secure employment via the facilitated process in WaterlooWorks (EI). It is structured, fits their academic timeline and is managed almost entirely on-campus whenever possible.

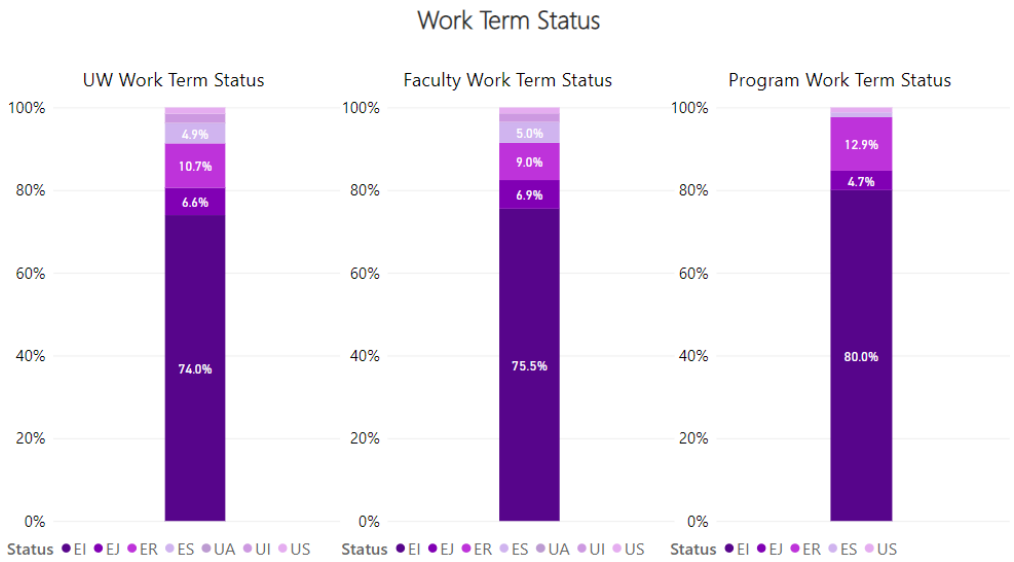
Returning to a previous employer (ER) is another desired outcome and a valuable experience for students. Undertaking additional work terms with the same employer (either sequentially or back-to-back) often provides enhanced responsibility, more robust work and heightened levels of awareness of the context in which the work is being completed.

Arranging one's own employment (ES) is an equally valuable activity; although, it can be time consuming. This kind of activity is often undertaken very early in the term (before the main match commences) or much later in the term when students seek to expand the number of opportunities available to them outside of the facilitated process.

While every effort is made to develop as many jobs as possible for all UW co-op students, and assistance is provided to help them be successful regardless of the method they use to secure their employment, 100% employment is not achieved every term (UI).

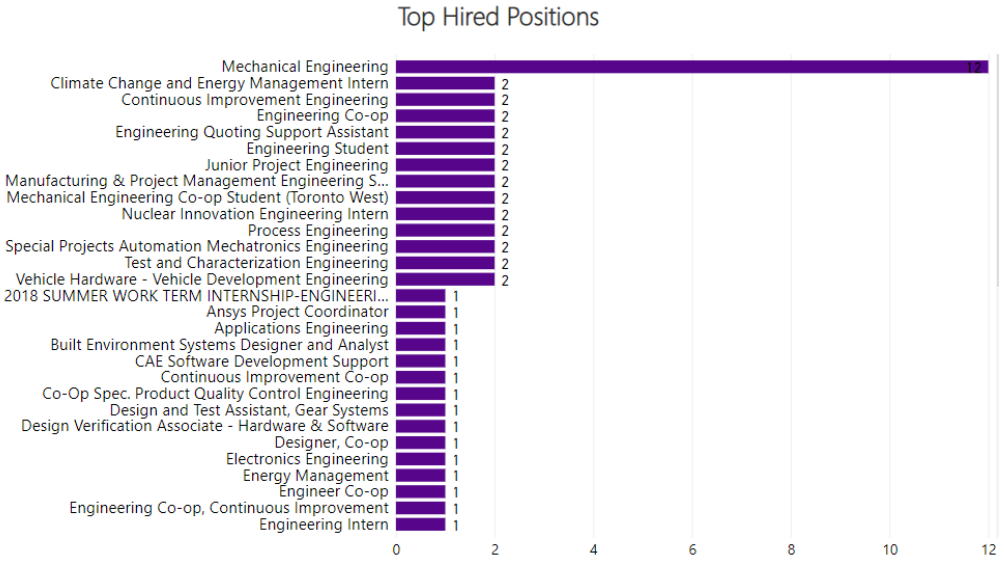
Program Work Term Statuses

The following graph illustrates the average distribution of work terms statuses for the GDip, Faculty of Engineering, and UW students over the past 4 years. Over this time, GDip students have secured work terms through our facilitated interview process (EI) at a higher rate than the Faculty and University of Waterloo averages, suggesting a high degree of success in competing for posted jobs.



The following graph illustrates the most common employers of GDip students over the past 4 years. As a small program with relatively low enrolment, most employers have only hired one or two GDip students. This lack of dependency on a single employer is encouraging, and suggests overall success in obtaining employment across a variety of employers. It should be noted, however, that one exception, Concord Screen, stands out, having employed 8 GDip students since Spring 2018, representing 9.5% of all GDip co-op positions.

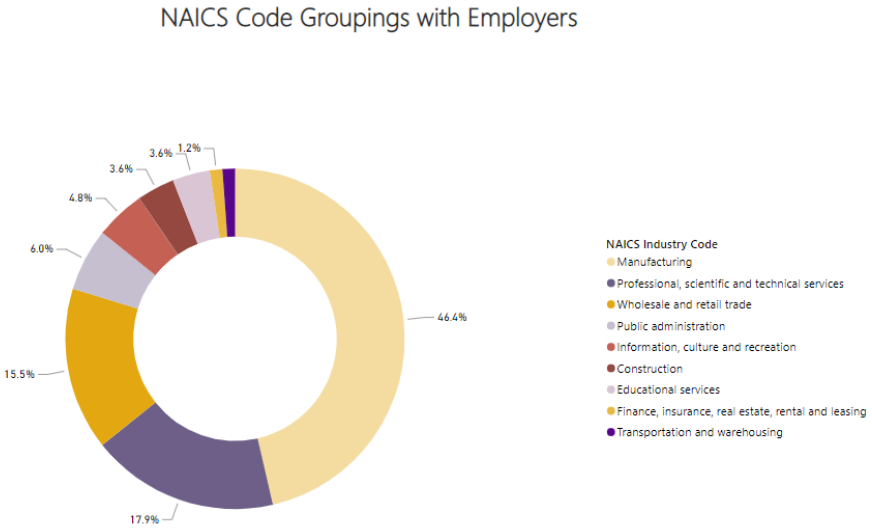
The following graph depicts most common positions held by GDip students over the course of the last 4 years. Unsurprisingly, the most common job title was simply 'Mechanical Engineering' with variations of 'Engineering Co-op' and 'Engineering Student' also appearing. Having said that, other position titles with greater role specificity reveal a diverse array of positions, with roles related to Climate Change and Energy Management, Continuous Improvement, Vehicle Hardware, Electronics, Nuclear Innovation, among many others.



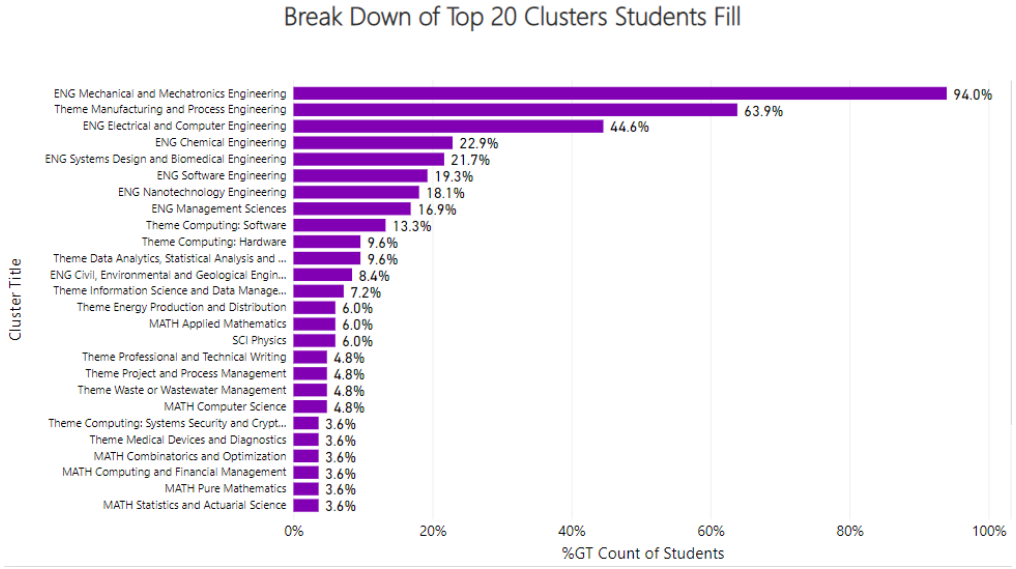
Work Terms by Industry

The following graph illustrates the distribution of NAICS code groupings for positons held by GDip students over the past 4 years. GDip work terms are predominantly focused within three NAICS code groupings: 'Manufacturing' (46.4%), 'Professional, Scientific, & Technical Services' (17.9%), and 'Wholesale and Retail Trade' (15.5%). These industries and distributions vary significantly from the

broader Faculty of Engineering averages; by comparison, the top three industries for the Faculty are Professional, Scientific, & Technical Services (30.2%), Manufacturing (22.5%), and Information, Culture and Recreation (9.9%).

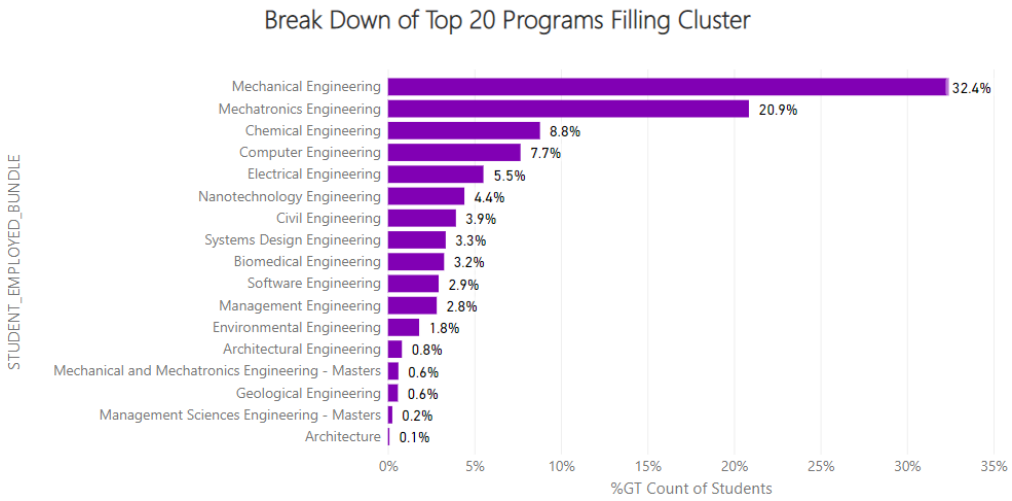


In WaterlooWorks, job postings are clustered in terms of relevance to various academic themes and programs. The following graph illustrates the top clusters assigned to the jobs filled by GDip students. Unsurprisingly the general academic cluster of 'ENG Mechanical and Mechatronics Engineering' was the most commonly assigned; this cluster acts as an umbrella for any employers seeking to hire students in the department, whether undergraduate or graduate. The thematic cluster associated with Manufacturing and Process Engineering was also quite prevalent, consistent with the industry classifications shown above.



Note: Job clustering capabilities were introduced in Winter 2017 when WaterlooWorks replaced JobMine as the University of Waterloo's online recruiting system. Co-operative Education is continuing to review cluster data (thematic and program clusters) and will develop a process to review programs included in clusters.

The following graph illustrates the Engineering programs of students that filled jobs assigned to the 'ENG Mechanical and Mechatronics' cluster since 2017. As expected for a small program, GDip students fill a relatively small proportion of the jobs associated with this cluster, as it also serves the much larger undergraduate population. Success in securing employment despite such competition, however, speaks to the quality and appeal of GDip students. It is noteworthy, however, that jobs can be assigned multiple clusters. Anecdotal evidence suggests that many of the jobs filled by students in other programs were also clustered to those students.

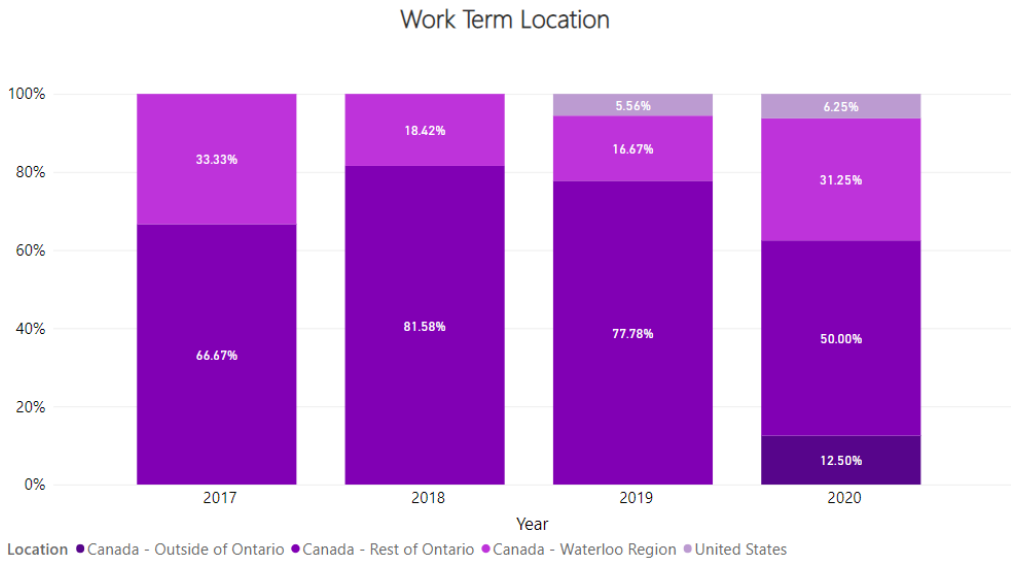


Unpaid Work Terms

It is a requirement of co-op work terms for students to be compensated. There are occasions when students do not receive a traditional salary but do receive some form of alternative remuneration. This may be an honorarium, or stipend, paid travel expenses, housing etc. Unpaid positions that are undertaken by these students are commonly with early-stage start-ups, where there is unavailable financial capital to support co-op hiring. GDip students, however, have not undertaken any unpaid work terms since the co-op option was introduced in 2017.

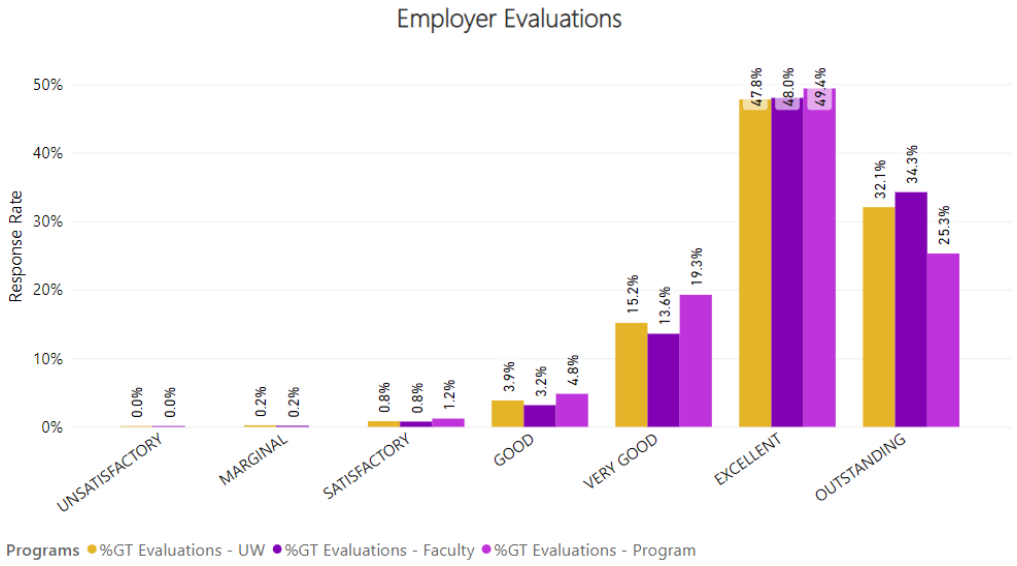
Location of Work Terms

As shown in the following chart, approximately 81% of GDip work terms took place in the Province of Ontario in 2020, 31% of which were in the Waterloo Region. Only 6% of work terms took place outside of Canada, compared to approximately 14% across the Faculty. This may be the result of a lack of awareness or understanding of the program amongst international employers, or perhaps that students are specifically seeking Canadian experience.



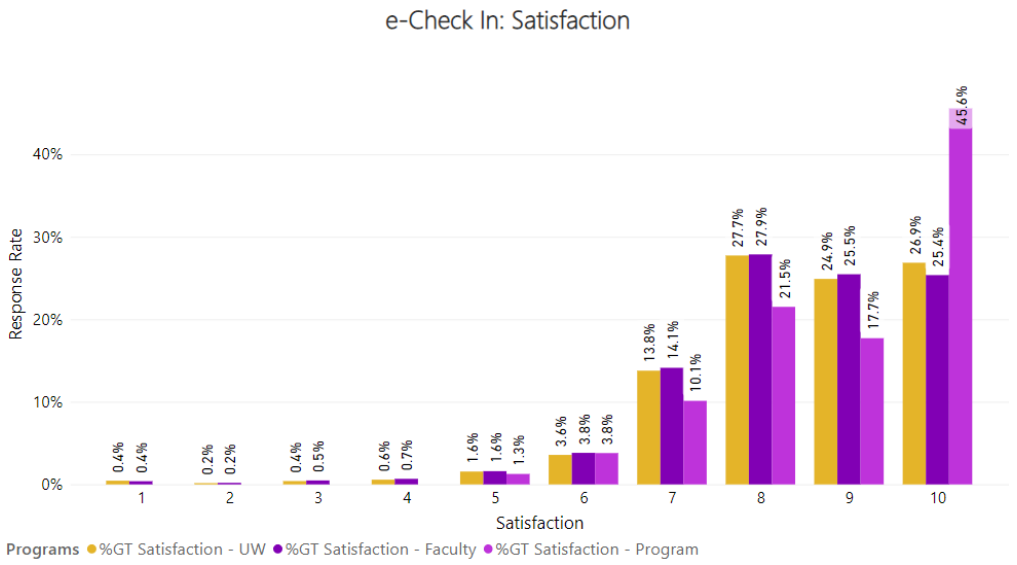
Employer Evaluations of Students

The following graph illustrates the distribution of employer evaluations of GDip, Faculty of Engineering, and UW students over the past 4 years. GDip students achieved consistently high results, though in general received less 'Outstanding' evaluations (25.3%) than the Faculty and University averages. While this may point to marginally lower employer satisfaction, it should be emphasized that evaluation results remain exceedingly high. In addition, it may also be possible that employer expectations may be different for GDip students, particularly given the different distribution of industries in which they work, and their graduate student status.



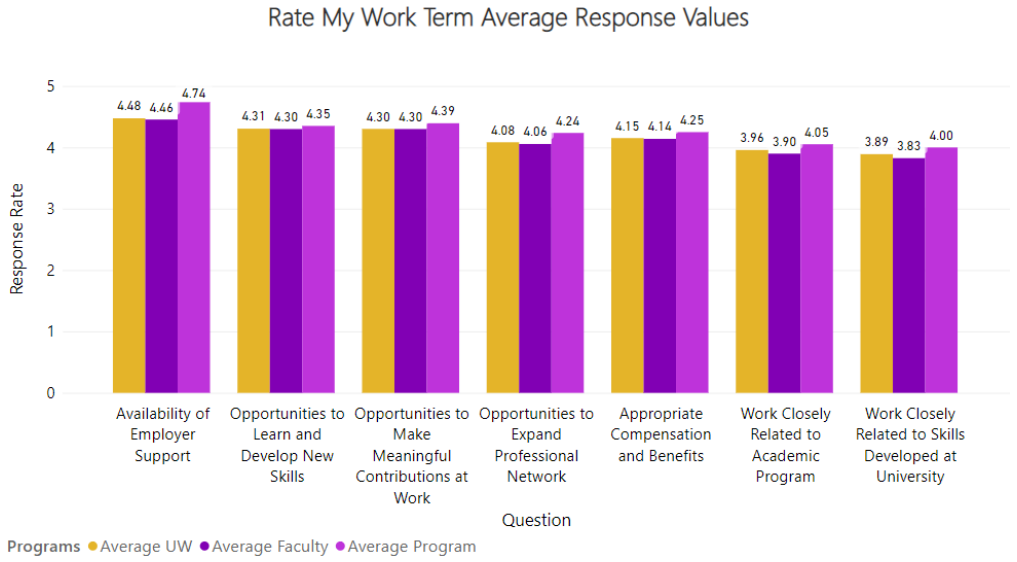
Student Evaluations of Work Experience

The following graph illustrates the distribution of student evaluations of work term satisfaction given by GDip, Faculty of Engineering, and UW students over the past 4 years. On average, GDip students tended to be notably more satisfied with their co-op work terms than both Faculty of Engineering and UW students, with nearly 46% of students rating their satisfaction at '10'.



Rate My Work Term Survey Results

The following graph illustrates the average rating of each Rate My Work Term (RMWT) evaluation category for GDip, Faculty of Engineering, and UW students. Each question is designed to assess the student's satisfaction with a different aspect of their work term experience. GDip students indicated higher satisfaction than Faculty and UW average responses in every RMWT category.



Co-op and Career Preparation

The Centre for Career Action's (CCA) vision aligns with that of the Co-operative and Experiential Education portfolio within which it sits: to connect imagination with impact for a better world through global leadership in co-operative and career education, experiential and work-integrated learning.

CCA supports all Waterloo students (regular and co-op, undergraduate and graduate), alumni and employees. Its mission is to educate and inspire all these learners to develop and take action to achieve current and future career goals. CCA accomplishes this through high quality in-person and on-line career education services addressing: career management strategies, graduate and professional school preparation, and effective work search strategies and tactics. Offerings include appointments, workshops/webinars, events, drop-in sessions and CCA's large on-line resource, CareerHub. The continuous improvement mindset held within CCA enables it to maintain its relevance to learners seeking support to identify and articulate their skills, find and create meaningful work and lifelong learning experiences, and ultimately build their resilience to navigate the ever-changing labour market.

In addition, Career Advisors in CCA act as the first point-of-contact/support for pre-first work term co-op students. These services include providing strategically-timed, proactive and hope-centred outreach, as well as highly responsive drop-in co-op consults. CCA is also the author of the Career Fundamentals (COOP 601) course made available to GDip students during their recruitment term.

Graduate Studies
Program Revision Template

This item for consideration on SGRC Regular Agenda

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

Faculty: Engineering

Programs: 1) Graduate Diploma (GDip) in Design Engineering

2) Graduate Diploma (GDip) in Design Engineering - Co-operative Program

Program contact name(s): Cecile Devaud

Form completed by: Cecile Devaud

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Discontinuing the Type 2 GDip in Design Engineering and the Type 2 GDip in Design Engineering - Co-operative Program.

Is this a major modification to the program? Yes

Rationale for change(s):

The GDip in Design Engineering and GDip in Design Engineering - Co-operative Program have relied on the availability of one faculty member with unique expertise in design, responsible for selecting students and teaching the three core courses (ME 680, ME 681 and ME 682). This faculty member is retiring in July 2023. The Department of Mechanical and Mechatronics Engineering does not have adequate teaching resources to continue the GDip in the same mode of operation and there is no plan in the short-term of hiring a new faculty member capable of teaching ME 680, ME 681 and ME 682 on a regular basis.
Further, the Department of Mechanical and Mechatronics Engineering is in the process of restructuring its MEng program with new graduate specializations and a direct entry co-op option that will offer alternatives to applicants interested in mechanical and mechatronics engineering MEng and co-op.

Proposed effective date: Term: Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-mechanical-and-mechatronics-engineering/graduate-diploma-gdip-design-engineering

https://uwaterloo.ca/graduate-studies-academic-calendar/engineering/department-mechanical-and-mechatronics-engineering/graduate-diploma-gdip-design-engineering-co-operative-program

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

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~**GRADUATE DIPLOMA (GDIP) IN DESIGN ENGINEERING**~~ ~~**Program information**~~ ~~• Delivery mode~~ ~~○ On-campus~~ ~~• Program type~~ ~~○ Diploma~~ ~~• Study option(s)~~ ~~○ Coursework~~ ~~**Admission requirements**~~ ~~• Minimum requirements~~ ~~○ Students in the Master of Engineering (MEng) in Mechanical and Mechatronics Engineering program may complete the requirements for the GDip in Design Engineering in conjunction with their MEng requirements.~~ ~~**Degree requirements**~~ ~~Coursework option:~~ ~~• Courses~~ ~~○ Students must complete the following courses:~~ ~~○ Mandatory courses:~~ ~~▪ ME 680 Advanced Design Engineering~~ ~~▪ ME 681 Advanced Design Engineering - Design Project 1~~ ~~▪ ME 682 Advanced Design Engineering - Design Project 2~~ ~~○ Specific courses: 1 from the following list:~~ ~~▪ ME 538 Welding Design, Fabrication and Quality Control~~ ~~▪ ME 555 Computer-Aided Design~~ ~~▪ ME 559 Finite Element Methods~~ ~~▪ ME 561 Fluid Power Control Systems~~ ~~▪ ME 566 Computational Fluid Dynamics for Engineering Design~~ ~~○ General courses: 4 additional Faculty of Engineering graduate courses (subject to the approval of the Department).~~	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~○ All courses are 600 and 700 level courses and students are not allowed to take more than 2 500 level courses (courses open to both undergraduates and graduates) out of their 8 required courses.~~ **~~GRADUATE DIPLOMA (GDIP) IN DESIGN ENGINEERING - CO-OPERATIVE PROGRAM~~** **~~Program information~~** ~~• Delivery mode~~ ~~○ On-campus~~ ~~• Length of program~~ ~~○ Students enrolled in this diploma option are granted one additional term to complete the requirements set by the Master of Engineering (MEng) in Mechanical and Mechatronics Engineering program:~~ ~~▪ Full-time: 5 terms (20 months)~~ ~~▪ Part-time: 10 terms (40 months)~~ ~~• Program type~~ ~~○ Co-operative~~ ~~○ Diploma~~ ~~• Study option(s)~~ ~~○ Coursework~~ **~~Admission requirements~~** ~~• Minimum requirements~~ ~~○ Students in the Master of Engineering (MEng) in Mechanical and Mechatronics Engineering program may complete the requirements for the GDip in Design Engineering - Co-operative Program in conjunction with their MEng requirements.~~ ~~○ Qualified students interested in the co-op option must submit an application by August 1st for 4-stream and by December 1st for the 8-stream and meet the following requirements:~~ ~~▪ Students will be interviewed by the Department before they are recommended to Co-operative and Experiential Education (CEE) for approval. Interviews will take place prior to the end of August or December for 4-~~	

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
~~stream and 8-stream options, respectively.~~ ~~▪ Students should submit the following with their application and prior to their interviews:~~ ~~▪ a. any previous Professional Engineering Licensure documents or licensure status~~ ~~▪ b. design portfolio (past design project experiences including capstone projects....)~~ ~~▪ An excellent command of the English language.~~ **~~Degree requirements~~** ~~Coursework option:~~ ~~• Courses~~ ~~○ Students must complete the following courses:~~ ~~○ Mandatory courses:~~ ~~▪ ME 680 Advanced Design Engineering~~ ~~▪ ME 681 Advanced Design Engineering - Design Project 1~~ ~~▪ ME 682 Advanced Design Engineering - Design Project 2~~ ~~○ Specific courses: 1 from the following list:~~ ~~▪ ME 538 Welding Design, Fabrication and Quality Control~~ ~~▪ ME 555 Computer-Aided Design~~ ~~▪ ME 559 Finite Element Methods~~ ~~▪ ME 561 Fluid Power Control Systems~~ ~~▪ ME 566 Computational Fluid Dynamics for Engineering Design~~ ~~○ General courses: 4 additional Faculty of Engineering graduate courses (subject to the approval of the Department).~~ ~~○ All courses are 600 and 700 level courses and students are not allowed to take more than 2 500 level courses (courses open to both undergraduates and graduates) out of their 8 required courses.~~	

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
• ~~Graduate Studies Work Report~~	

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

Students currently pursuing the GDips will not be impacted by the changes. In Fall 2023 and Winter 2024, ME 681 and ME 682, which are project-based courses, will be offered to existing GDip students to complete their degree.

Department/School approval date (mm/dd/yy): 02/02/23
Reviewed by GSPA (for GSPA use only) ☒ date (mm/dd/yy): 02/01/23
Faculty approval date (mm/dd/yy): 03/21/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Mathematics Graduate Studies report

1. Calendar changes to Pure Math

Motion to define 3 term length of the following MMath programs:

- Master of Mathematics (MMath) in Pure Mathematics
- Master of Mathematics (MMath) in Pure Mathematics - Quantum Information

Motions to change the wording for PMath required courses from:

- Doctor of Philosophy (PhD) in Pure Mathematics
- Doctor of Philosophy (PhD) in Pure Mathematics - Quantum Information

2. Calendar changes to Statistics and Actuarial Science

This item for consideration on SGRC Regular Agenda

Motion to discontinue the MMath Statistics coursework option for:

- Master of Mathematics (MMath) in Statistics

Motion to change of the program requirements for:

- Master of Quantitative Finance (MQF)

Motion to update/change course description and/or title for

- STAT 833 to match changes to STAT 433
- ACTSC 964
- STAT 908 Statistical Inference
- STAT 923 Multivariate Analysis

Motion to create the course ACTSC 969 Stochastic Calculus for Quantitative Finance

3. Calendar change to Computer Science

Motion to change the required English language proficiency (ELP) scores from the alternative higher scores to a new set of required scores for:

- Doctor of Philosophy (PhD) in Computer Science
- Doctor of Philosophy (PhD) in Computer Science - Quantum Information
- Master of Mathematics (MMath) in Computer Science
- Master of Mathematics (MMath) in Computer Science - Quantum Information

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These have been approved by the Mathematics Faculty Council on February 28th, 2023.

Graduate Studies
Program Revision Template

This item for consideration on SGRC Regular Agenda

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

Faculty: Mathematics

Program: Master of Mathematics (MMath) in Statistics

Program contact name(s): Shoja'eddin Chenouri, Mary Lou Dufton

Form completed by: Mary Lou Dufton

Description of proposed changes:
Note: changes to courses and milestones also require the completion/submission of the SGRC Graduate Studies Course/Milestone Form.

Discontinue the coursework study option from the MMath in Statistics *program.*

Is this a major modification to the program? Yes

Rationale for change(s):

The coursework study option, which includes a required specialization in Data Science, is being discontinued because the option has been replaced by a) the MMath in Data Science, and b) the Master of Data Science and Artificial Intelligence (MDSAI) programs (note: these Data Science programs are supported by the Department of Statistics and Actuarial Science, the Department of Combinatorics and Optimization, and the School of Computer Science). The Department of Statistics and Actuarial Science has not accepted applications to the coursework study option since Spring 2019 and has directed applicants to the Data Science programs.

Proposed effective date: Term: ~~Spring~~ Fall Year: 2023

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

https://uwaterloo.ca/graduate-studies-academic-calendar/mathematics/department-statistics-and-actuarial-science/master-mathematics-mmath-statistics

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
Graduate research fields • Computational Statistics • Finance • Industrial Statistics • Probability • Statistical Theory and Methods	**Graduate research fields** • Computational Statistics • Finance • Industrial Statistics • Probability • Statistical Theory and Methods

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

Program information
 	
• **Admit term(s)**
  ○ Fall
 	
• **Delivery mode**
  ○ On-campus
 	
• **Program type**
  ○ Master's
  ○ Research
 	
• **Registration option(s)**
  ○ Full-time
  ○ Part-time
 	
• **Study option(s)**
  ○ Thesis
  ○ Master's Research Paper
  ~~○ Coursework~~
 	
Admission requirements
 	
• **Minimum requirements**
  ○ A four-year Honours Bachelor degree with a significant statistics and/or actuarial science component.
  ○ An overall 78% average from a Canadian university (or its equivalent).
  ○ An interview may be required.
 	
• **Application materials**
  ○ Résumé
  ○ Supplementary information form
  ○ Transcript(s)
 	
• **References**
  ○ Number of references: 3
  ○ Type of references: normally from academic sources
 	
• **English language proficiency (ELP)** (if applicable)
 	
Degree requirements
 	
Thesis option:
 	
• **Graduate Academic Integrity Module (Graduate AIM)**
 	
• **Courses**
	Program information
	
	• **Admit term(s)**
	  ○ Fall
	
	• **Delivery mode**
	  ○ On-campus
	
	• **Program type**
	  ○ Master's
	  ○ Research
	
	• **Registration option(s)**
	  ○ Full-time
	  ○ Part-time
	
	• **Study option(s)**
	  ○ Thesis
	  ○ Master's Research Paper
	
	Admission requirements
	
	• **Minimum requirements**
	  ○ A four-year Honours Bachelor degree with a significant statistics and/or actuarial science component.
	  ○ An overall 78% average from a Canadian university (or its equivalent).
	  ○ An interview may be required.
	
	• **Application materials**
	  ○ Résumé
	  ○ Supplementary information form
	  ○ Transcript(s)
	
	• **References**
	  ○ Number of references: 3
	  ○ Type of references: normally from academic sources
	
	• **English language proficiency (ELP)** (if applicable)
	
	Degree requirements
	
	Thesis option:
	
	• **Graduate Academic Integrity Module (Graduate AIM)**
	
	• **Courses**

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
○ Students must complete 4 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ The 4 courses must include STAT 850 Estimation and Hypothesis Testing and at least 2 900-level STAT courses. • **Graduate Skills Workshop** • **Master's Thesis** ○ Students must complete a thesis and an oral presentation. **Master's Research Paper option:** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must complete 7 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ 3 of the 7 required courses should include: ▪ STAT 830 Experimental Design or STAT 835 Statistical Methods for Process Improvement ▪ STAT 850 Estimation and Hypothesis Testing ▪ STAT 854 Sampling Theory and Practice ○ Exemptions can be made to these required courses at the discretion of the Associate Chair for Graduate Studies. • **Graduate Skills Workshop** • **Master's Research Paper** ○ Students must complete a research paper that will be given a numeric grade which appears on the transcript beside the milestone. ~~**Coursework option:**~~ ~~The coursework option includes a specialization in Data Science.~~ ~~Note: The Department of Statistics and Actuarial Science is not currently accepting applications for the coursework option.~~	○ Students must complete 4 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ The 4 courses must include STAT 850 Estimation and Hypothesis Testing and at least 2 900-level STAT courses. • **Graduate Skills Workshop** • **Master's Thesis** ○ Students must complete a thesis and an oral presentation. **Master's Research Paper option:** • **Graduate Academic Integrity Module (Graduate AIM)** • **Courses** ○ Students must complete 7 one-term (0.50 unit weight) courses with an overall average of at least 70%. ○ 3 of the 7 required courses should include: ▪ STAT 830 Experimental Design or STAT 835 Statistical Methods for Process Improvement ▪ STAT 850 Estimation and Hypothesis Testing ▪ STAT 854 Sampling Theory and Practice ○ Exemptions can be made to these required courses at the discretion of the Associate Chair for Graduate Studies. • **Graduate Skills Workshop** • **Master's Research Paper** ○ Students must complete a research paper that will be given a numeric grade which appears on the transcript beside the milestone.

Current Graduate Studies Academic Calendar content:	Proposed Graduate Studies Academic Calendar content:
• ~~**Graduate Academic Integrity Module (Graduate AIM)**~~ • ~~**Courses**~~ ○ ~~Students must complete 8 one-term (0.50 unit weight) graduate courses [with an overall average of at least 70%] from the Data Science lists of courses.~~ ○ ~~Students should take a minimum of 4 STAT courses, and no courses which are neither STAT nor Computer Science (CS).~~ ○ ~~Students must satisfy the following course requirements:~~ ○ ~~Foundation course:~~ ▪ ~~CS 600 Fundamentals of Computer Science for Data Science~~ ○ ~~Students with a STAT major degree are expected to take the foundation course CS 600. However, STAT major students will be exempted from taking CS 600 if they have a sufficient background in Computer Science; instead they will be required to take another CS course from the elective course list.~~ ○ ~~Required core courses:~~ ▪ ~~STAT 847 Exploratory data analysis~~ ▪ ~~CS 631 Data-Intensive Distributed Analytics~~ ○ ~~1 of the following required breadth courses:~~ ▪ ~~STAT 841 Statistical Learning: Classification~~ ▪ ~~STAT 842 Data Visualization~~ ▪ ~~STAT 844 Statistical Learning: Advanced Regression~~ ○ ~~4 elective courses from the following list:~~ ▪ ~~STAT 840 Computational Inference~~ ▪ ~~STAT 841 Statistical Learning: Classification~~ ▪ ~~STAT 842 Data Visualization~~ ▪ ~~STAT 844 Statistical Learning: Advanced Regression~~ ▪ ~~STAT 946 Topics in Probability and Statistics~~ ▪ ~~CS 638 Principles of Data Management and Use~~	

Current Graduate Studies Academic Calendar content:	**Proposed Graduate Studies Academic Calendar content**:
~~▪ CS 648 Database Systems Implementation~~ ~~▪ CS 654 Distributed Systems~~ ~~▪ CS 658 Computer Security and Privacy~~ ~~▪ CS 680 Introduction to Machine Learning~~ ~~▪ CS 685 Machine Learning Theory: Statistical and Computational Foundations~~ ~~▪ CS 686 Introduction to Artificial Intelligence~~ ~~▪ CS 740 Database Engineering~~ ~~▪ CS 741 Parallel and Distributed Database Systems~~ ~~▪ CS 743 Principles of Database Management and Use~~ ~~▪ CS 786 Probabilistic Inference and Machine Learning~~ ~~▪ CS 798 Advanced Research Topics~~ ~~▪ CS 848 Advanced Topics in Databases~~ ~~▪ CS 856 Advanced Topics in Distributed Computing~~ ~~▪ CS 858 Advanced Topics in Cryptography, Security and Privacy~~ ~~▪ CS 870 Advanced Topics in Scientific Computing~~ ~~▪ CS 886 Advanced Topics in Artificial Intelligence~~ ~~o Note: CS 798: CS courses at the 800 level, and STAT courses at the 900 level should be on a topic in Data Science; they are subject to the approval of the Graduate Officer.~~ ~~• **Data Science Requirement**~~ ~~o Students must complete the required core data science courses in order to satisfy the Data Science Requirement milestone.~~	

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

There are no students currently registered in MMath Statistics Data Science Specialization and therefore there is no impact with these changes.

Department/School approval date (11/25/22):

Reviewed by GSPA (for GSPA use only) ▣ date (mm/dd/yy):08/25/22
Faculty approval date (mm/dd/yy):02/28/23
Senate Graduate & Research Council (SGRC) approval date (mm/dd/yy):
Senate approval date (mm/dd/yy) (if applicable):

Towards a Proposed Vision: Graduate Studies at Waterloo

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

Winter 2023

UNIVERSITY OF WATERLOO

VISION FOR GRADUATE STUDIES AT WATERLOO

Discussion Questions for SGRC

1. Do the vision and the pathways articulated resonate with you in your administrative role?
2. The vision document asks our colleagues in the Faculties to consider changes (increases) to enrollments in graduate programs. How can the graduate and research communities work collaboratively to address the challenges identified to achieving this goal?
3. If the University realizes its vision to have interdisciplinarity as an academic differentiator, what roles will your unit play in supporting interdisciplinarity – academically, professionally and in the development of community of scholars on campus?
4. Noting that our graduate students play various roles on campus – as learners, researchers, and employees – in which capacities does your unit interact with graduate students? Are there "customer service" like standards that your unit has adopted to ensure high quality, positive interactions with graduate students?

VISION FOR GRADUATE STUDIES AT WATERLOO

Discussion Questions for SGRC

5. The graduate community recognizes the contributions of our graduate students to the University's research mission. The vision document identifies a gap in the University's ability to measure, document, and celebrate these contributions. The vision seeks to record the impact of our graduate students' work which will differ across disciplines and units. Is there a role for your unit to play in quantifying and communicating graduate students' contributions and impacts in research?
6. The vision document suggests that pre-professional training and support for our graduates can be a strong student attractor, and a way in which our alumni remain more connected to the University. In your unit, are there efforts to support graduate students' preparation for and transition to their post-graduation activities? How strong is your unit's connection to our alumni and do these connections contribute to the strength and attraction of Waterloo's graduate programs?