FACULTY OF SCIENCE

COUNCIL OF THE FACULTY OF SCIENCE

Notice of Meeting
Tuesday, December 11, 2018
at 3:00pm – 4:30pm
306 Lumbers

Agenda

1. Call to Order and Approval of Agenda
2. Chair's Remarks
3. Approval of Minutes of November 13, 2018 meeting
4. Business Arising
5. Inquiries and Communications
    - Senate Synopsis: meeting of November 22, 2018
6. Dean's Report to Council
7. Associate Deans' and Head of Bethune College Remarks
8. Reports from Science Representatives on Senate Committees
9. Reports from Standing Committees of Council

    9.1 Executive Committee

    Curriculum Committee (consent agenda items)
10. Other Business

    10.1 FSc Decanal Search: Position profile (item for information)

FACULTY OF SCIENCE

COUNCIL OF THE FACULTY OF SCIENCE

Tuesday, November 13, 2018
at 3:00pm – 4:30pm
306 Lumbers

Minutes

Attendance: P. Wilson (Chair), M. H. Armour, D. R. Hastie, M. Xu, EJ Janse van Rensburg, M. McCall, J. Lazenby, P. L. Lakin-Thomas, A. Mills, R. Tsushima, G. F. Audette, D. Hossain, G. G. Lavoie, R. McLaren, Elwick, A. Mun, T. Baumgartner, C. Caputo, R. A. Fournier, J. Trinh, A. Subhay, P. J. Szeptycki, S. Siyakatshana (Assistant Secretary)

Guests: H. McLellan, B. Sheeller & M. Hough

1. **Call to Order and Approval of Agenda**

   The Chair of Council, P. Wilson, called the meeting to order and the Agenda was approved as presented.

2. **Chair's Remarks**

   The Chair extended a special welcome to student representatives in attendance.

3. **Approval of Minutes of October 9, 2018 meeting**

   A motion was moved, seconded and carried to approve the minutes.

4. **Business Arising**

   There was no Busing Arising.

5. **Inquiries and Communications**

   Council noted Senate Synopses of meetings held on September 27, 2018 and October 25, 2018.

6. **Dean's Report to Council**

   Interim Dean, E. J. Janse van Rensburg informed Council that his office would soon be sending out pertinent information for the fourteen academic searches for this year. He stressed on the need to conduct all searches in a timely manner.

   He reported that Science in conjunction with Lassonde held a Carswell Scholars Lunch & Reception on November 1, 2018, at the Bergeron Center. He added that Allan Carswell and his wife graced the occasion.

   The Dean informed Council that the Physics & Optics Labs had been completely upgraded with new equipment.

   He congratulated Jennifer Chen (Chemistry), who was named to the Top 40 under 40 Power List 2018 by the Analytical Scientist magazine. He applauded her for increasing the visibility of our Faculty.

   He also congratulated Ryan Hili (Chemistry), who received the Petro-Canada Young Innovator award for his program on developing modified nucleic acid polymers, using synthetic DNA template libraries.

   The Dean reminded Council members on the following,

   - Faculty of Science Research & Teaching Awards, deadline is November 30th.
   - York Science Fellowships, deadline is January 4th 2019
   - 2018 President's Research Excellence Awards, deadline is November 24th

Pertaining to the various awards, the Dean encouraged faculty members to nominate their colleagues and also encourage their students to nominate their professors respectively.

Upcoming events;

- November 16 – 18, Art Orellana and Ryan Hili to host the Quebec-Ontario Mini-Symposium for Synthetic and Bioorganic Chemistry (QOMSBOC) at York.
- November 21, Jane Heffernan to organize and moderate Café Mathematique – Series on Infectious Disease: "The Flu, Math and You" at the Fields Institute.

7. **Associate Deans' and Head of Bethune College Remarks**

Associate Dean Mills announced to Council that our new Education Development Specialist for Science Initiatives (Ashley Nahornick) and our Experiential Education Coordinator (Irene Seo) were now settled in and making a positive impact in the Faculty. He reported that he continues to work with the Faculty of Health on the neuroscience program. Lastly, he reported that he is working with colleagues in the Department of Geography and Faculty of Environmental Studies reviewing existing environmental science offerings.

Associate Dean Don Hastie reminded faculty members to submit their CVs as requested. He informed Council that the call for the Academic Equipment Fund had already been sent out. He encouraged departments to use the templates provided when submitting their requests. Finally, he stated that the Office of the Dean was still processing remediation claims. He reminded faculty members that remediation forms should be submitted to the Office of the Dean no later than December 31st.

8. **Reports from Science Representatives on Senate Committees**

Robert Tsushima informed Council that the Academic Policy Planning and Research Committee (APPRC) in joint collaboration with the Academic Standards Curriculum and Pedagogy Committee (ASCPC) will hold a forum of ideas on December 6, in the New Student Center. The purpose of the forum is to have colleagues that have developed new programs share their challenges and successes. He hoped that the University Secretariat office would send out a formal invitation soon.

9. **Reports from Standing Committees of Council**

9.1 Executive Committee

Ratification of Student Representative Nominations

Jennifer Chen moved a motion and Jill Lazenby seconded to nominate Robert Cheung as the Science student representative on Senate. Motion was carried.

A motion was moved, seconded and carried to approve all student nominations to the Standing Committees of Council as presented.

9.2 Curriculum Committee (consent agenda items)

Council approved the Curriculum Committee items.

10. **Other Business**

10.1 Update: FSc Decanal Search Committee

P. Wilson announced to Council the following Decanal Search Committee members;

1. Lyndon Martin (Chair) Dean, Faculty of Health
2. Parissa Safai (Faculty of Health)
3. Gary Sweeney (Biology)
4. Cora Young (Chemistry)
5. Juris Stepran (Mathematics & Statistics)
6. Michael De Robertis (Physics & Astronomy)
7. Christopher Bergevin (Physics & Astronomy)
8. Mary Helen Armour (Science and Technology Studies)
9. Helen McLellan (Non Academic Staff, EO, Office of the Dean)
10. Paige Whyte-Fagundes (Biology Graduate Student)
11. Robert Cheung (Biology Undergraduate student)

She noted that the initial meeting of the committee had already taken place.

10.2 York Cares United Way campaign: Stephen Childs, Senior Institutional Analyst - Surveys & Special Projects

Stephen Childs made a brief presentation on the York Cares United Way campaign.

10.2 Faculty Council Discussions of Freedom of Speech Policy Initiative

Council reviewed the draft document by the York working group and a discussion led by M. McCall ensued.

Council noted that the University was required to develop and publish a policy on the Freedom of Speech Policy by January 5, 2019.

Meeting adjourned.

P. Wilson, Chair of Council

S. Siyakatshana, Assistant Secreatry of Council

The Senate of York University

Synopsis

The 651st Meeting of Senate
held on Thursday, November 22, 2018

Remarks

In her report, President Rhonda Lenton discussed the Ontario Economic Outlook and Fiscal Review, which, with the exception of the announcement of the cancellation of the French-language university, did not shed light on the Ontario government's plans for the post-secondary sector. In view of the Finance Minister's statements that the "fiscal hole is deep" and "everyone in Ontario will be required to make sacrifices," budget cuts to all publicly supported institutions are anticipated in the provincial budget to be issued next spring. President Lenton affirmed that she will work with colleagues at York, across the sector and at COU to advocate for the sector, and also will undertake York-specific advocacy. Regarding the French-language university, President Lenton has conveyed to the Minister of Francophone Affairs and Attorney General York's willingness to continue to support French-language post-secondary education, and will work collectively with the other bilingual Ontario universities, the University of Ottawa and Laurentian University, in this area.

Other comments made by President Lenton included the following:

- the federal government's Fall Economic Statement, released earlier in the week, which will be reviewed for implications for York and the university sector
- the shifting ground on the university budget consultations in light of the uncertainty around the provincial budget, and themes that have emerged during the consultations, including deferred maintenance, labour relations, interdisciplinary scholarship, and ensuring classrooms are equipped with appropriate technology
- explorations to proceed with Markham Centre Campus, including efforts to build relationships with potential donors, seek federal government funding, and build a case for provincial funding of enrolment for the campus
- the plans to further the UAP priority of establishing an internationalization strategy, to be led by a Working Group with representation from all faculties and from the administration and undergraduate and graduate students; a call for expressions of interest for the Working Group will be issued soon
- highlights from the Kudos Report and recent events she had attended including the annual retirees luncheon

Reports

Under the auspices of the Academic Policy, Planning and Research Committee, Vice-President Research and Innovation Rob Haché presented the annual report on research.

The Senate of York University

Synopsis

Approvals

Senate approved recommendations of its Academic Standards, Curriculum and Pedagogy Committee to:

- change the requirements for the Certificate in Athletic Therapy, School of Kinesiology and Health Science, Health
- change the requirements for the BA (Honours) Programs in Business Economics, Glendon

Committee Information Reports

Executive (Professor Alison Macpherson, Vice-Chair)

The Executive Committee provided notice of motion to Senate for the Statement of Policy on Free Speech, which will come forward to Senate for approval at the meeting of 13 December 2018. Senators shared views on the draft Statement during a discussion facilitated by the Chair of the Free Speech Policy Working Group, Professor Lorne Sossin, Osgoode.

The Executive Committee's information items included the following:

- the forthcoming annual call for expressions of interest in membership on Senate committees and other positions elected by Senate, with Senators encouraged to help identify prospective candidates
- approval of Senate committee members nominated by Faculty Councils
- the Committee's joint efforts with the Board Executive Committee to bring forward to Senate a recommendation on a process to clarify the responsibilities of the Board, Senate and Administration for the suspension of classes during a disruption
- additions to the pool of prospective honorary degree recipients
- regarding the Committee's review of Senate Rules, Procedures and Guidelines, the call to Senators, distributed by email on November 5, to provide input on the preliminary list of the aspects of the rules proposed for focus in this round
- efforts to create a message board for Senators that could function independently of e-mail
- the Committee's monitoring of the academic disruption

Academic Policy, Planning and Research (Professor Les Jacobs, Chair)

APPRC provided information on these items:

- preliminary discussions regarding the establishment of a new / "revisioned" faculty composed of Geography, the Faculty of Environmental Studies and other possible units
- plans to hold an academic planning forum in early 2019

The Senate of York University

Synopsis

- defining an action plan on Incomparable Metrics to track the University's success in research and scholarship through indicators
- tracking 2015-2020 UAP progress and framing the process for developing the next Plan
- update on plans for Markham Centre Campus following the announcement of the cancellation of provincial funding for the Campus

ASCP (Professor Kim Michasiw, Chair)

ASCP provided information on this item:

- minor changes to the requirements for the Finance stream within the Bachelor of Commerce (Honours) Program, School of Administrative Studies, Liberal Arts & Professional Studies

Awards (Professor Brenda Spotton Visano, Chair)

The Awards Committee information items were the following:

- revisions to the Procedures for Nomination in the Senate Policy on Honorific Professorships, to allow nomination files of those not selected for the University Professorship and Distinguished Research Professorship to be held for reconsideration for three years
- revisions to the President's University-Wide Teaching Awards Criteria to allow nomination files of full-time faculty and contract/adjunct faculty not selected to be reconsidered for three years
- the distribution of the call for nominations for the President's University-Wide Teaching Awards, with details available on the Awards Committee webpage

Additional Information about this Meeting

Please refer to the full Senate agenda and supplementary material posted online with the November 22, 2018 meeting for details about these items.

http://secretariat.info.yorku.ca/senate/meeting-agendas-and-synopses/

December Meeting of Senate

Senate's next meeting will be held at 3:00 p.m. on Thursday, December 13, 2018.

York University

COUNCIL OF THE FACULTY OF SCIENCE

Report of the Science Curriculum Committee

November 2018

The Faculty of Science Curriculum Committee has reviewed proposals for changes to course information and degree requirements and recommends to the Executive Committee that the following changes be submitted to Council for approval.

Details regarding these proposals (and regarding other minor changes to Calendar/Repository course descriptions and prerequisites which were approved by the Committee but are not reported here) are included in the working papers of November 27, 2018, meeting of the Curriculum Committee, which are on file for your inspection in the Office of the Dean, with all members of the Curriculum Committee or by contacting the Secretary of the Committee at tinar@yorku.ca

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Agenda

1. Chemistry

1.1 Change in degree requirements: "BSc. Biochemistry"

2. Mathematics and Statistics

2.1 Change m pre/co-requisite and cross listing: SC/MATH4650 3.0
2.2 Change in course format/mode of delivery: SC/MATH 1300 3.0
2.3 Change in course format/mode of delivery: SC/MATH 1310 3.0
2.4 Change in calendar description: Bachelor Applied Mathematics (BA and BSc) program

3 Physics & Astronomy

3.1 Change in pre/co-requisite: SC/BPHS 2090 3.0 "Current Topics in Biophysics"
3.2 New course: SC/PHYS 1011 3.0 "Physics 1"
3.3 New course: SC/PHYS 1012 3.0 "Physics 2"
3.4 New course: SC/PHYS 1411 3.0 "Physics Fundamentals 1"
3.5 New course: SC/PHYS 1412 3.0 "Physics Fundamentals 2"
3.6 New course: SC/PHYS 1421 3.0 "Physics with Life Science Applications 1"
3.7 New course: PHYS 1422 3.0 "Physics with Life Science Applications 2"

Non-Major Modification Program Changes

1. Program: Chemistry

2. Degree Designation: Honours Major BSc in Biochemistry

3. Type of Modification: Changes to degree requirements

4. Effective Date: Fall 2019

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5. State what the changes are:

   Currently, the Seneca-York Chemistry Coregistration option is only available to students in the Honours Major BSc in Chemistry. The proposed change is to broaden the eligibility of the Seneca-York Chemistry Coregistration option to include students in the Honours Major BSc degree in Biochemistry.

6. Provide the rationale for the proposed changes that is rooted in the program learning outcomes:

   The Seneca-York Chemistry Coregistration option affords students the ability to take 2-5 selected courses at Seneca College as electives within their York degree. Those courses carry the SC/SENE rubric and are listed in Appendix A. They have been approved by Science Faculty Council in 2016-2017. They were chosen in part because they all have laboratory components that train students in industry-standard procedures using industry-standard instruments, and train them in standards and proper documentation practices. This option thus provides a strong experiential learning opportunity in a way that York could not without a significant investment in resources, and greatly enhances the prospects on the job market for those students interested in laboratory-based careers in the private sector and in government.
   The program learning outcomes (PLOs), which are based on the UUDLEs, are met with the current degree requirements. The proposed change is therefore not meant to address any lacunae but to offer alternate paths to meeting the PLOs with a greater variety of available electives. We anticipate, however, that the proposed change will significantly enhance the ability of students to meet those specific PLOs that deal with laboratory activities and professionalism as well as communication skills.

7. Provide an updated mapping of the program requirements to the program learning outcomes to illustrate how the proposed requirements will support the achievement of program learning objectives:

   See Appendix B.

8. If relevant, summarize the consultation undertaken with relevant academic units, including commentary on the impact of the proposed changes on other programs. Provide individual statements from the relevant program(s) confirming consultation and their support:

   This option was developed beginning in 2015 at the suggestion of the School of Biological Sciences and Applied Chemistry at Seneca College and in thorough consultation with them.

Since the proposed change has no impact on other degree programs, consultations with other York units were not needed.

9. Describe any resource implications and how they are being addressed (e.g., through a reallocation of existing resources). If new/additional resources are required, provide a statement from the relevant Dean(s)/Principal confirming resources will be in place to implement the changes:

   No new resources are required.

10. Provide a summary of how students currently enrolled in the program will be accommodated:

    As the proposed change will not affect the ability of current Honours Major BSc students to graduate, we intend to allow current students to choose this option and thereby graduate with the modified degree requirements.

11. Provide as an appendix a side-by-side comparison of the existing and proposed program requirements as they will appear in the Undergraduate or Graduate Calendar:

    See Appendix C.

Appendix A

Eligible Seneca Courses

York-Seneca Coregistration Option

Seneca Course Number and Title	York Course Number (same title)	cce
TAC333 Techniques in Analytical Chemistry	SENE 2081 3.0	CHEM 3080 4.0
TAC357 Techniques in Analytical Chemistry	SENE 2082 3.0	CHEM 3080 4.0
CMI333 Chemical Instrumentation	SENE 2083 3.0	
PHA333 Pharmaceutical Analysis	SENE 2084 3.0	
EII533 Environmental Impact of Industrial Processes	SENE 3072 3.0	
PHT533 Pharmacology and Applied Toxicology	SENE 3073 3.0	CHEM 2550 3.0
PPF633 Pharmaceutical Product Formulations	SENE 3074 3.0	
CMI533 Chemical Instrumentation	SENE 3083 3.0	
PHA533 Pharmaceutical Analysis – Advanced	SENE 3084 3.0	
PTC633 Polymer Technology	SENE 3091 3.0	CHEM 3090 3.0

Contributions to Program Learning Outcomes

York-Seneca Coregistration Option for the Honours Major BSc Biochemistry degree

Seneca Course Number and Title	Contributions to the Program Learning Outcomes for the Honours BSc Chemistry
TAC333 Techniques in Analytical Chemistry	Ib. understanding of advanced concepts, methods and assumptions in Biochemistry Ic. the ability to apply learning from other areas (e.g. math, physics) Id. the ability to carry out basic chemical and biochemical laboratory activities and specialized biochemical experimental activities safely and reliably Ie. an awareness of some current issues relating to Biochemistry in general and an in-depth awareness of the current issues in a chosen area IIb. the ability to collect, organize, analyze, interpret and present basic types of quantitative and qualitative data appropriate to general Biochemistry IIIa. the ability to effectively apply basic problem-solving skills consistent with the scientific method in molecular Biology, Chemistry, and to apply advanced skills in Biochemistry IIIb. the ability to identify appropriate experimental approaches to answering questions consistent with the scientific method in molecular Biology and Biochemistry IVb. the ability to communicate basic scientific ideas outside of Biochemistry to peers and to a scientific audience (orally and in writing) Va. the ability to effectively work with others in laboratory, research and class settings Vb. initiative, personal responsibility and accountability in laboratory and class settings Vc. behaviour consistent with academic integrity and social responsibility
TAC357 Techniques in Analytical Chemistry	
CMI333 Chemical Instrumentation	
PHA333 Pharmaceutical Analysis	
EII533 Environmental Impact of Industrial Processes	
PHT533 Pharmacology and Applied Toxicology	
PPF633 Pharmaceutical Product Formulations	
CMI533 Chemical Instrumentation	
PHA533 Pharmaceutical Analysis – Advanced	
PTC633 Polymer Technology	

Appendix C

Calendar Copy Changes

Biochemistry
Faculty of Science
Program-Specific Degree Requirements

Current Calendar Copy
Honours Major Program
[...]

D. Upper level requirement: additional elective credits or credits satisfying a minor or second major at the 3000 or 4000 levels for a minimum 42 credits at the 3000 and 4000 levels

[...]

Proposed Calendar Copy
Honours Major Program
[...]

D. Upper level requirement:
- additional elective credits or credits satisfying a minor or second major at the 3000 or 4000 levels for a minimum 42 credits at the 3000 and 4000 levels
- **Co-registration option: Students may take 6-15 credits of certain SC/SENE courses to help satisfy the upper-year and overall credit requirements while co-registered for one term at Seneca@York, and in adherence to Senate legislation and Seneca College standards, deadlines and procedures. For these purposes, students may choose from the following SC/SENE courses in analytical and instrumental technology, pharmaceutical technology and material science: SC/SENE 2081 3.00, SC/SENE 2082 3.00, SC/SENE 2083 3.00, SC/SENE 2084 3.00, SC/SENE 3072 3.00, SC/SENE 3073 3.00, SC/SENE 3074 3.00, SC/SENE 3083 3.00, SC/SENE 3084 3.00, SC/SENE 3091 3.00. Once completed, SC/SENE courses will appear on the York transcript and the grades earned will count in the York grade point average calculations.**

[...]

LASSONDE SCHOOL OF ENGINEERING | YORK UNIVERSITÉ UNIVERSITY

Note: Any section shaded blue **must** be completed for Engineering related courses **in addition** to the other sections

CURRICULUM COMMITTEE TEMPLATE
NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies) i.e. LAPS/SC/LE	LE
Department: Indicate department and course prefix (e.g. Languages, GER)	ESSE
Effective Date:	Fall 2018
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	LE/ENG 4650
Var:	
Academic Credit Weight: Indicate both the fee, and MET weight if different from academic weight (e.g. AC=6, FEE=8, MET=6)	AC=3

Accreditation Unit Breakdown:

Indicate the proposed accreditation unit breakdown as a percentage and unit(s) in the appropriate subject matter areas. Definitions are provided in Appendix A

	Math	Natural Science	Compl Studies	Eng. Science	Eng. Design
Percentage				57%	43%
Units				24	18

If the sum of engineering science and engineering design exceeds 50% of the total, indicate which P.Eng. faculty could be possible instructors for this course:	Jinjun Shan George Vukovich Regina Lee

Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Feedback Control Systems
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Feedback Control

Note: Any section shaded blue must be completed for engineering related courses in addition to the other sections

CURRICULUM COMMITTEE TEMPLATE
CHANGES TO EXISTING COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies) i.e. LAPS/SC/LE	LE
Department: Indicate department and course prefix (e.g. Languages, GER)	ESSE
Date of Submission:	September 13, 2018
Effective Session for Change:	**Term:** (e.g., Fall; Winter; Summer) Fall — **Year:** 2019
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	LE/ENG 4650 — **Var:**
Academic Credit Weight: Indicate both the fee, and MET weight if different from academic weight (e.g. AC=6, FEE=8, MET=6)	3.00
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Feedback Control Systems
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Feedback Control

Is this course cross-listed? (Yes/No) No

If *yes*, cross-listed to: *(please complete details below)*

Faculty:		**Rubric:**		**Course #:**		**Weight:**	
Faculty:		**Rubric:**		**Course #:**		**Weight:**	
Faculty:		**Rubric:**		**Course #:**		**Weight:**	

Type of Change (check all that apply): *(click check box to enable check-mark option)*

- ☐ in course number / year-level
- ☐ in calendar description (editorial)
- ☐ in course credit exclusion(s)
- ☐ in credit value
- ☒ in pre-requisite(s)/co-requisite(s)
- ☐ in course format/delivery mode
- ☐ in course title (editorial)
- ☒ in cross-listing
- ☐ retire/expire course
- ☐ other (please specify):

(Change From):	(Change To):
LE/ENG 4650 Pre-requisite: LE/ENG 4550	LE/ENG 4650 and SC/MATH 4650 Pre-requisite: LE/ENG 4550 or the following combination of courses: SC/MATH 3410 3.00; SC/MATH 2270 3.00 or SC/MATH 2271 3.00; SC/MATH 2022 3.00.

Academic Rationale for Changes

The following points should be included in the rationale:

- How the course contributes to the educational objectives of the **program/degree/Faculty.**

-The relationship of the proposed change to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

- The expected enrolment in the course.

There is a strong desire for students in the Department of Mathematics and Statistics to take this course starting from 2019-2020. As a result, we propose to cross-list this course with Faculty of Science. Consultation between the Math/Stats Department and Earth and Space Science and Engineering occurred, which lead to the decision of the cross listing.

Notes:

For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible in this form. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is include

Accreditation Unit Breakdown		Math	Natural Science	Compl Studies	Eng Science	Eng Design
Indicate the revised accreditation unit breakdown as a percentage and unit(s) in the appropriate subject matter areas. Definitions are provided in Appendix A	Percentage				57%	43%
	Units				24	18
	If the sum of engineering science and engineering design exceeds 50% of the total, indicate which P.Eng. faculty could be possible instructors for this course:					

Expanded Course Description:

Please provide a detailed course description, including topics/theories and learning objectives, as it will appear in supplemental calendars for any revisions made.

Expanded Description including topics and theories:
No change
Course Learning Objectives: Course learning objectives are statements of the overall learning and teaching intentions for the course and represent what the instructor would expect students to learn and retain in the course. They articulate what the teacher plans to achieve in the course.
No change

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Please detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, please explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance

No change

Course Learning Outcomes: List the course learning outcomes/indicators that will be achieved by the end of this course, and map these to the appropriate CEAB graduate attributes and UDLEs. These course learning outcomes will be assessed and measured in the course for accreditation purposes.	***Please select those Degree Level Expectations that will be addressed in the course*** **Undergraduate Degree Level Expectations** ☐ Depth and breadth of knowledge ☐ Knowledge of methodologies ☐ Application of knowledge ☐ Communication skills ☐ Awareness of limits of knowledge ☐ Autonomy and professional capacity **Learning outcomes** articulate what the student will achieve by the end of the course. They provide a framework for assessment by stating what you expect the learners to be able to demonstrate after completing the course. A succinct learning outcome specifies the tasks students are expected to be able to perform and the level of competence expected for the tasks. No change	***Please select those CEAB Graduate Attributes that will be addressed in the course (see appendix B for definitions)*** **Graduate Attribute** ☒ Knowledge base for Engineering ☒ Problem Analysis ☒ Investigation ☒ Design ☒ Use of Engineering Tools ☒ Individual and Team Work ☒ Communication Skills ☒ Professionalism ☒ Impact of Engineering on Society and the Environment ☒ Ethics and Equity ☒ Economics and Project Management ☒ Life-Long Learning

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).

2. Number of department/division members currently competent to teach the course.

3. Instructor(s) likely to teach the course in the coming year.

4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained OR in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

No Change

Faculty and Department/ Division Approval for changes to Cross-listings:

If the course is to be cross-listed with another department/division this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept.:	Signature (Authorizing cross-list)	Math/Stats	Oct 23, 2018
		Department	Date
Dept.:	Signature (Authorizing cross-list)	ESSE/LE	Oct 24, 2018
		Department	Date
Dept.:	Signature (Authorizing cross-list)		
		Department	Date

APPENDIX A: Accreditation Units

Accreditation Units (AUs) are defined on an hourly basis for an activity which is granted academic credit and for which the associated number of hours corresponds to the actual contact time between the student and the faculty members, or designated alternates, responsible for delivering the program:

1 AU	=	One hour of lecture (corresponding to 50 minutes of activity)
0.5 AU	=	One hour of laboratory or scheduled tutorial

Engineering design integrates mathematics, basic sciences, engineering sciences and complementary studies in developing elements, systems and processes to meet specific needs. It is a creative, iterative and often open-ended process subject to constraints which may be governed by standards or legislation to varying degrees depending upon the discipline. These constraints may relate to economic, health, safety, environmental, social or other pertinent interdisciplinary factors.
[The primary feature distinguishing engineering science from engineering design is the open ended nature of the problems. A design question runs along the lines of "design a system that meets the following specifications" whereas an engineering science question is "for the following example, calculate X, Y, and Z"]

Engineering science subjects normally have their roots in mathematics and basic sciences, but carry knowledge further toward creative applications. They may involve the development of mathematical or numerical techniques, modelling, simulation and experimental procedures. Application to the identification and solution of practical engineering problems is stressed. Such subjects include the applied aspects of strength of materials, fluid mechanics, thermodynamics, electrical and electronic circuits, soil mechanics, automatic control, aerodynamics, transport phenomena and elements of materials science, geoscience, computer science, environmental studies and other subjects pertinent to the discipline. In addition, the curriculum should include engineering science content which imparts an appreciation of important elements of other engineering disciplines.

[i.e. the subject may be science, but the aim is towards practical applications, with practical examples.]

The basic (natural) sciences component of the curriculum must include elements of physics and chemistry; elements of life sciences and earth sciences may also be included in this category. These subjects are intended to impart an understanding of natural phenomena and relationships through the use of analytical and/or experimental techniques.

Mathematics includes appropriate elements of linear algebra, differential and integral calculus, differential equations, probability, statistics, numerical analysis and discrete mathematics.

Complementary studies in humanities, social sciences, arts, management, engineering economics and communication that complement the technical content of the curriculum.

[If a course is to include a complementary studies component, a portion of the grading must be allocated accordingly, e.g. part of the grade is for the grammar of a report.]

APPENDIX B: CEAB GRADUATE ATTRIBUTES

Section	Graduate Attribute	Description
3.1.1	Knowledge base for Engineering	Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.
3.1.2	Problem Analysis	An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.
3.1.3	Investigation	An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.
3.1.4	Design	An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
3.1.5	Use of Engineering Tools	An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.
3.1.6	Individual and Team Work	An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.
3.1.7	Communication Skills	An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.
3.1.8	Professionalism	An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.
3.1.9	Impact of Engineering on Society and the Environment	An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.
3.1.10	Ethics and Equity	An ability to apply professional ethics, accountability, and equity.
3.1.11	Economics and Project Management	An ability to appropriately incorporate economics and business practices including project, risk, and change management into engineering practice and to understand their limitations.
3.1.12	Life-Long Learning	An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.

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Brief Course Description:

Maximum 300 words or 2000 characters.

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

This course teaches fundamentals of control design and analysis using state-space methods. This includes both the practical and theoretical aspects of the topic. The students are expected to design controllers using state-space methods and evaluate the control performance and validate if these controllers are robust to system uncertainties and external disturbances.

Prerequisites:	**LE/ENG 4550**
Co-requisites:	**N/A**

Will this course be cross-listed? (Yes/No) No **If *yes*, cross-listed to:** *(please complete details below)*

Faculty:		**Rubric:**		**Course #:**		**Weight:**	
Faculty:		**Rubric:**		**Course #:**		**Weight:**	
Faculty:		**Rubric:**		**Course #:**		**Weight:**	

Additional cross-listings (if applicable):

Generic Course Description:

This is the description of the "Parent/Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

Please list all degree credit exclusions, prerequisites, integrated courses, and notes below the course description (these will be in addition to the 40 word brief course description).

This course teaches fundamentals of control design and analysis using state-space methods. This includes both the practical and theoretical aspects of the topic. The students are expected to design controllers using state-space methods and evaluate the control performance and validate if these controllers are robust to system uncertainties and external disturbances.

Topics of this course include: (1) Design controllers using state-space methods and analyze using classical tools; (2) Understand impact of implementation issues such as nonlinearities, time delay; (3) Indicate the robustness of your control design; (4) Linearize a nonlinear system, and analyze stability. Prerequisites: LE/ENG 4550 or by instructor's permission. 3 lecture hours per week; 1 tutorial hour per week.

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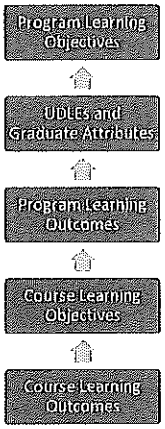
Expanded Course Description:

Please provide a detailed course description, including topics/theories and learning objectives, as it will appear in supplemental calendars.



Expanded Description including topics and theories:

Topics Covered

- State-space control design and analysis of feedback control systems
- Design of state-space controllers; estimation filters; dynamic output feedback
- Limitations on performance of control systems
- Digital control
- Linearization and analysis of nonlinear systems
- Model uncertainty and robustness

These topics will be divided into 7 chapters and the lecture schedule is given as follows:

Chapter 1: Introduction and basics (2 lectures)
Chapter 2: Review of classical synthesis techniques (2 lectures)
Chapter 3: State-space approach (4 lectures)
Chapter 4: State estimation (4 lectures)
Chapter 5: Output feedback (2 lectures)
Chapter 6: Digital control basics (4 lectures)
Chapter 7: Nonlinear system (4 lectures)

Lecture 1	Introduction
Lecture 2	Basic root locus: analysis and examples
Lecture 3	Frequency response methods
Lecture 4	Control design using Bode plots
Lecture 5	Introduction to state-space
Lecture 6	Analysis of the State Equations
Lecture 7	Control law design for full-state feedback
Lecture 8	Pole placement approach
Lecture 9-10	Estimator Design
Lecture 11	Combined estimators and regulators
Lecture 12	Reference Input with the Estimator
Lecture 13	Deterministic linear quadratic regulator (LQR)
Lecture 14	Linear quadratic Gaussian (LQG)
Lecture 15-18	Digital control basics
Lecture 19-22	Analysis of nonlinear systems

Course Learning Objectives: Course learning objectives are statements of the overall learning and teaching intentions for the course and represent what the instructor would expect students to learn and retain in the course. They articulate what the teacher plans to achieve in the course.

Upon successful completion of this course the student will be able to:

- Explain differences between linear and nonlinear systems and uncertainties in a system
- Analyze the effects of modeling errors, uncertainties and disturbances on control systems.
- Design full-state and output feedback controllers
- Use computer software tools to design state-space controllers and implement these controllers to physical plants.
- Present their design results by means of oral communication, drawings, and design reports.
- Apply Lyapunov approach to prove stability
- Utilize technical literature to remain current on engineering knowledge

The following software will be employed during the lecture/tutorial sessions.

MATLAB and Simulink

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Please detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, please explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance

Course Design to Supports Students in Achieving Learning Objectives:

The course will have a total of 48 scheduled contact hours, which include 36 hours of lectures and 12 hours of tutorials. Student-to-student communications will be encouraged through various activities in tutorials as well as in class discussions. Student-to-instructor communications will be fostered through emails, online forum, and scheduled office hours.

Face-to-Face Communications:

- 1 instructor to teach 1 lecture section, we expect to have 20 students at beginning and the enrollment will increase to 80
- 1 TA per 20 students to run 1 tutorial sections and grade assignments, midterm test
- Weekly tutorial section (i.e., 20 students per section) will involve practicing the uses of Matlab & Simulink.
- In-class activities also include:
  - The course will involve solving number of component design in class
  - Tutorial activity with TAs to reinforce their in-class learning
  - One-to-one session with Matlab & Simulink with help of TAs

Out-of-Class Activities:

- Assignments on selected topics throughout the course

Other Course Components:

- Quizzes, midterms and final exam provide additional points along the course to assess students' achievements in different course learning outcomes

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Course Learning Outcomes:	*Please select those Degree Level Expectations that will be addressed in the course*	*Please select those CEAB Graduate Attributes that will be addressed in the course (see appendix B for definitions)*
List the course learning outcomes/indicators that will be achieved by the end of this course, and map these to the appropriate CEAB graduate attributes and UDLEs. These course learning outcomes will be assessed and measured in the course for accreditation purposes.	**Undergraduate Degree Level Expectations** ☒ Depth and breadth of knowledge ☒ Knowledge of methodologies ☒ Application of knowledge ☒ Communication skills ☒ Awareness of limits of knowledge ☐ Autonomy and professional capacity **Learning outcomes** articulate what the student will achieve by the end of the course. They provide a framework for assessment by stating what you expect the learners to be able to demonstrate after completing the course. A succinct learning outcome specifies the tasks students are expected to be able to perform and the level of competence expected for the tasks. 1. Explain the basic concepts of a control system (linear, nonlinear systems, stability, uncertainties, modeling errors, etc.) [GA1, GA7] 2. Understand the advantages and limitations of different control system design methodologies. [GA1, GA3 & GA12] 4. Design and analyze various controllers using computer software. [GA2, GA3, GA4 and GA5] 5. Demonstrate the ability to consider technical and practical limitations into the design of a control system. [GA6, GA12] 6. Utilize technical literature to analyze current control theories and applications. [GA12]	**Graduate Attribute** ☒ Knowledge base for Engineering ☒ Problem Analysis ☒ Investigation ☒ Design ☒ Use of Engineering Tools ☒ Individual and Team Work ☒ Communication Skills ☐ Professionalism ☐ Impact of Engineering on Society and the Environment ☐ Ethics and Equity ☐ Economics and Project Management ☒ Life-Long Learning

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Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).

2. Number of department/division members currently competent to teach the course.

3. Instructor(s) likely to teach the course in the coming year.

4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained OR in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

1. Planned frequency of offering & number of sections anticipated:

- Every year in winter semester to 4th year space engineering undergraduate students; we anticipate students from Mechanical Engineering, Electrical Engineering, and Software Engineering may also take this course.
- 1 section of 20 students (up to 80 students in future).

2. Number of department/division members currently competent to teach the course:

- At least 3 faculty members in the Department of Earth and Space Science and Engineering can teach; some faculty members in Mechanical Engineering or Electrical Engineering can also teach.

3. Instructor(s) likely to teach the course in the coming year:

- Jinjun Shan, George Vukovich and Regina Lee.

4. Summary of contact hours:

- In-class (contact hours):
  Lectures: 3 hours per week for 12 weeks
  Tutorials: 1 hours per week for 12 weeks

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Homework assignments: 25%
Midterm 1: 15%
Midterm 2: 15%
Final Exam: 45%

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Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDE

Feedback Control of Dynamic Systems
Authors: Gene F. Franklin, J. David Powell, and Abbas Emami-Naeini
Publisher: Pearson; 5th ed. (2006)
Language: English
ISBN-10: 0131499300
ISBN-13: 978-0131499300

A statement from Engineering Librarian, John Dupuis has been attached to this proposal.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSESWILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

The following summarizes special remarks for the physical resources:

- Lecture rooms with standard presentation facilities (i.e., PC/laptop with PowerPoint and projector)

Course Rationale:

The following points should be addressed in the rationale:

- How the course contributes to the educational objectives of the **program/degree/Faculty.**

-The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

- The expected enrolment in the course.

- Control system design is a popular field in many engineering disciplines including space engineering. Currently there is only one classical control course (ENG 4550) offered at York University. This course exposes the students to advanced control system design approaches including state-space, output feedback, estimator design, digital control and nonlinear system. These topics are considered as modern control system. Such course is very important for space engineering but not available at York University. The gained knowledge and experience in this course will help our students for their future career or graduate studies.

- This is an advanced control course. The students should take ENG 4550 Introduction to Control Systems before taking ENG 4650.

- Expected enrollment in 2018-2019: approximately 20 students. The enrollment will increase gradually and we anticipate the steady-state enrollment will be 80 students.

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Faculty and Department/ Division Approval for Cross-listings:

If the course is to be cross-listed with another department/division this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept.: _____ _____ _____
Signature (Authorizing cross-list) Department Date

Dept.: _____ _____ _____
Signature (Authorizing cross-list) Department Date

Dept.: _____ _____ _____
Signature (Authorizing cross-list) Department Date

APPENDIX A: Accreditation Units

Accreditation Units (AUs) are defined on an hourly basis for an activity which is granted academic credit and for which the associated number of hours corresponds to the actual contact time between the student and the faculty members, or designated alternates, responsible for delivering the program:

1 AU	=	One hour of lecture (corresponding to 50 minutes of activity)
0.5 AU	=	One hour of laboratory or scheduled tutorial

Engineering design integrates mathematics, basic sciences, engineering sciences and complementary studies in developing elements, systems and processes to meet specific needs. It is a creative, iterative and often open-ended process subject to constraints which may be governed by standards or legislation to varying degrees depending upon the discipline. These constraints may relate to economic, health, safety, environmental, social or other pertinent interdisciplinary factors.
[The primary feature distinguishing engineering science from engineering design is the open ended nature of the problems. A design question runs along the lines of "design a system that meets the following specifications" whereas an engineering science question is "for the following example, calculate X, Y, and Z"]

Engineering science subjects normally have their roots in mathematics and basic sciences, but carry knowledge further toward creative applications. They may involve the development of mathematical or numerical techniques, modelling, simulation and experimental procedures. Application to the identification and solution of practical engineering problems is stressed. Such subjects include the applied aspects of strength of materials, fluid mechanics, thermodynamics, electrical and electronic circuits, soil mechanics, automatic control, aerodynamics, transport phenomena and elements of materials science, geoscience, computer science, environmental studies and other subjects pertinent to the discipline. In addition, the curriculum should include engineering science content which imparts an appreciation of important elements of other engineering disciplines.

[i.e. the subject may be science, but the aim is towards practical applications, with practical examples.]

The basic (natural) sciences component of the curriculum must include elements of physics and chemistry; elements of life sciences and earth sciences may also be included in this category. These subjects are intended to impart an understanding of natural phenomena and relationships through the use of analytical and/or experimental techniques.

Mathematics includes appropriate elements of linear algebra, differential and integral calculus, differential equations, probability, statistics, numerical analysis and discrete mathematics.

Complementary studies in humanities, social sciences, arts, management, engineering economics and communication that complement the technical content of the curriculum.

[If a course is to include a complementary studies component, a portion of the grading must be allocated accordingly, e.g. part of the grade is for the grammar of a report.]

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APPENDIX B: CEAB GRADUATE ATTRIBUTES

Section	Graduate Attribute	Description
3.1.1	Knowledge base for Engineering	Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.
3.1.2	Problem Analysis	An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.
3.1.3	Investigation	An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.
3.1.4	Design	An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
3.1.5	Use of Engineering Tools	An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.
3.1.6	Individual and Team Work	An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.
3.1.7	Communication Skills	An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.
3.1.8	Professionalism	An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.
3.1.9	Impact of Engineering on Society and the Environment	An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.
3.1.10	Ethics and Equity	An ability to apply professional ethics, accountability, and equity.
3.1.11	Economics and Project Management	An ability to appropriately incorporate economics and business practices including project, risk, and change management into engineering practice and to understand their limitations.
3.1.12	Life-Long Learning	An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.

Rationale to cross-list ENG 4650 (Feedback Control Systems) with MATH/STATS:

Written by Amenda Chow (Math/Stats) and Jinjun Shan (Lassonde/ESSE)

1. Feedback Control Systems is an interdisciplinary subject between mathematics and engineering. Applications of control systems are routed in engineering, while control systems are described using fundamental mathematics concepts. By cross-listing, students taking this course will be enriched by subject material developed from both a mathematical and engineering perspective.

2. The applied mathematics program is growing at both the undergraduate and graduate level; however, the number of applied mathematics courses has remained unchanged in recent years. The addition of this course will strengthen applied mathematics program at York.

3. Lastly, as this course has an experimental component, resources are optimized by sharing between both departments. This has already occurred when both departments combined their control equipment purchase and was consequently able to receive a substantial discount from the Vendor. We look forward to future collaborations.

Note: this cross listing has been approved at both department units.

Changes to Existing Course

Faculty:

Department: Mathematics and Statistics

Date of Submission: November 1, 2018

Course Number: MATH 1300

Effective Session: FW 2019/2020

Course Title: Differential Calculus with Applications

Type of Change:

- [ ] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [ ] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):
- [ ] in cross-listing
- [ ] in degree credit exclusion(s)
- [ ] regularize course (from Special Topics)
- [x] in course format/mode of delivery *
- [ ] retire/expire course
- [ ]

Change From:	To:
No scheduled tutorials.	A one hour tutorial session will be added each week. This tutorial time is to be devoted explaining routine calculations and exercises on on such calculations. The tutorial is intended to be an integral part of the course attended by all students.

Rationale:

The tutorial will free time during the main lectures to cover the more difficult theoretical material.

Resource implication: faculties with tutorials as part of their teaching load will be assigned to teach the tutorials of Math 1300. This may lead to an increase to TAs assigned to the Math/Stats Lab.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction" information.

FS Resource Implications Form Unit: Math & Stats Date: Nov 26, 2018

		Course(s) Created ☐ or Modified to ☐x (check one)		Course(s) Retired ☐ or Modified from ☐
Complete Course Designation		Math 1300 Differential Calculus with applications	same	
Enrolment (Estimate or Last Offering)		In Fall 2018 roughly 140 in each of the four sections. One more section offered in W19	Expected to be similar	
Number of:	Lecture Sections:	4 (Fall) + 1 (Winter)	same	
	Lab Sections:	0		
	Tutorial Sections:	2	5	
Number of:	Course Coordinators (Tutor 1):			
	Lab Demonstrators (Tutor 2):			
	Mark/Graders (Tutor 3):	653 TA hours for	Expected to be similar	
Prerequisites (P) Corequisites (C) Credit Exclusions (E)		(E):Math 1013, Math 1505, Econ 1530, Math 1550, Modr 1930, ISCI 1401, ISCI 1410	same	
For which degree program is this required (if applicable)?		Computer science and all math programs	same	
Other resource implications (please specify)		Faculties who have tutorials as part of their teaching load will teach the tutorials		
Reason(s) for creation/ modification/ retirement		With faculties teaching the computational part of the course, the instructors will be able to spend more time covering the theory. This will better prepare the math majors for upper level courses.	The computer science UPD, Eric Ruppert, welcomes the change for their computer science majors.	

Changes to Existing Course

Faculty:

Department: Mathematics and Statistics

Date of Submission: November 1, 2018

Course Number: MATH 1310

Effective Session: FW 2019/2020

Course Title: Integral Calculus with Applications

Type of Change:

- [ ] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [ ] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):
- [ ] in cross-listing
- [ ] in degree credit exclusion(s)
- [ ] regularize course (from Special Topics)
- [x] in course format/mode of delivery *
- [ ] retire/expire course
- [ ]

Change From:	To:
No scheduled tutorials.	A one hour tutorial session will be added each week. This tutorial time is to be devoted explaining routine calculations and exercises on on such calculations. The tutorial is intended to be an integral part of the course attended by all students.

Rationale:

The tutorial will free time during the main lectures to cover the more difficult theoretical material.

Resource implication: faculties with tutorials as part of their teaching load will be assigned to teach the tutorials of Math 1310. This may lead to an increase to TAs assigned to the Math/Stats Lab.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction" information.

FS Resource Implications Form Unit: Math & Stats Date: Nov 26, 2018

		Course(s) Created ☐ or Modified to ☐x (check one)		Course(s) Retired ☐ or Modified from ☐
Complete Course Designation		Math 1310 Integral Calculus with applications	same	
Enrolment (Estimate or Last Offering)		F 2018: total of 215 students in 2 sections. W 2019: expect 150 students in each of 3 sections	Expected to be similar	
Number of:	Lecture Sections:	2 (Fall) + 3 (Winter)	same	
	Lab Sections:	0		
	Tutorial Sections:	2	5	
Number of:	Course Coordinators (Tutor 1):			
	Lab Demonstrators (Tutor 2):			
	Mark/Graders (Tutor 3):	583 TA hours for	Expected to about 675	
Prerequisites (P) Corequisites (C) Credit Exclusions (E)		(P): Math 1300/1013, ISCI1401, Econ 1530 and 1540 (E):Math 1014/1505/1550 Modr 1940, ISCI 1402, ISCI 1410	same	
For which degree program is this required (if applicable)?		Computer science and all math programs	same	
Other resource implications (please specify)		Faculties who have tutorials as part of their teaching load will teach the tutorials		
Reason(s) for creation/ modification/ retirement		With faculties teaching the computational part of the course, the instructors will be able to spend more time covering the theory. This will better prepare the math majors for upper level courses.	The computer science UPD, Eric Ruppert, welcomes the change for their computer science majors.	

Proposed minor change to the Bachelor Applied Mathematics (BA and BSc) program requirements in the Academic Calendar

Rationale:

We propose to remove Math 2281 from the requirements of the 90-credit Bachelor program in Applied Mathematics. Math 2281 is a demanding course taken by Actuarial Science majors and students planning to do a Master degree in Business Administration or Financial Engineering. A typical student in the 90-credit Bachelor Applied Mathematics program will find the content of Math 2281, which is option pricing, arcane and challenging. After the removal of Math 2281, the program requires 45 credits in Mathematics, which exceeds the Major requirements for Bachelors programs for both BA and BSc degrees. As a result, we do not require an additional three-credit course in mathematics.

Change from	Changes	Change to
Bachelor of Arts Program (BA) • LE/EECS 1560 3.00; • SC/MATH 1021 3.00; SC/MATH 1131 3.00; SC/MATH 1200 3.00; SC/MATH 1300 3.00; SC/MATH 1310 3.00; • SC/MATH 2022 3.00; SC/MATH 2030 3.00; SC/MATH 2041 3.00; SC/MATH 2270 3.00; SC/MATH 2310 3.00; SC/MATH 2280 3.00; SC/MATH 2281 3.00; • SC/MATH 3171 3.00, SC/MATH 3330 3.00, SC/MATH 3333 3.00; • at least 3 additional credits at the 3000 or 4000 level • additional elective credits, as required for an overall total of at least 90 credits, of which at least 18 credits are at the 3000 level or higher. •	**Bachelor of Arts Program (BA)** • LE/EECS 1560 3.00; • SC/MATH 1021 3.00; SC/MATH 1131 3.00; SC/MATH 1200 3.00; SC/MATH 1300 3.00; SC/MATH 1310 3.00; • SC/MATH 2022 3.00; SC/MATH 2030 3.00; SC/MATH 2041 3.00; SC/MATH 2270 3.00; SC/MATH 2310 3.00; SC/MATH 2280 3.00; ~~SC/MATH 2281 3.00~~; • SC/MATH 3171 3.00, SC/MATH 3330 3.00, SC/MATH 3333 3.00; • at least 3 additional credits at the 3000 or 4000 level • additional elective credits, as required for an overall total of at least 90 credits, of which at least 18 credits are at the 3000 level or higher. •	**Bachelor of Arts Program (BA)** • LE/EECS 1560 3.00; • SC/MATH 1021 3.00; SC/MATH 1131 3.00; SC/MATH 1200 3.00; SC/MATH 1300 3.00; SC/MATH 1310 3.00; • SC/MATH 2022 3.00; SC/MATH 2030 3.00; SC/MATH 2041 3.00; SC/MATH 2270 3.00; SC/MATH 2310 3.00; SC/MATH 2280 3.00; • SC/MATH 3171 3.00, SC/MATH 3330 3.00, SC/MATH 3333 3.00; • at least 3 additional credits at the 3000 or 4000 level • additional elective credits, as required for an overall total of at least 90 credits, of which at least 18 credits are at the 3000 level or higher. •
Bachelor Program (BSc) B. Major requirements: • SC/MATH 1021 3.00; SC/MATH 1131 3.00; SC/MATH 1200 3.00;	**Bachelor Program (BSc)** B. Major requirements: • SC/MATH 1021 3.00; SC/MATH 1131 3.00; SC/MATH 1200 3.00;	**Bachelor Program (BSc)** B. Major requirements: • SC/MATH 1021 3.00; SC/MATH 1131 3.00; SC/MATH 1200 3.00;

SC/MATH 1300 3.00; SC/MATH 1310 3.00; • SC/MATH 2022 3.00; SC/MATH 2030 3.00; SC/MATH 2041 3.00; SC/MATH 2270 3.00; SC/MATH 2310 3.00; SC/MATH 2280 3.00; SC/MATH 2281 3.00; • SC/MATH 3171 3.00; SC/MATH 3330 3.00; SC/MATH 3333 3.00; • at least 3 additional math credits at the 3000 and 4000 level;	SC/MATH 1300 3.00; SC/MATH 1310 3.00; • SC/MATH 2022 3.00; SC/MATH 2030 3.00; SC/MATH 2041 3.00; SC/MATH 2270 3.00; SC/MATH 2310 3.00; SC/MATH 2280 3.00; ~~SC/MATH 2281 3.00;~~ • SC/MATH 3171 3.00; SC/MATH 3330 3.00; SC/MATH 3333 3.00; • at least 3 additional math credits at the 3000 and 4000 level;	SC/MATH 1300 3.00; SC/MATH 1310 3.00; • SC/MATH 2022 3.00; SC/MATH 2030 3.00; SC/MATH 2041 3.00; SC/MATH 2270 3.00; SC/MATH 2310 3.00; SC/MATH 2280 3.00; • SC/MATH 3171 3.00; SC/MATH 3330 3.00; SC/MATH 3333 3.00; • at least 3 additional math credits at the 3000 and 4000 level;

Changes to Existing Course

Faculty:

Department: Biology

Date of Submission: Oct. 2018

Course Number: SC/BPHS 2090 3.00
SC/BIOL 2090 3.00

Effective Session: Summer 2019

Course Title: Current Topics in Biophysics

Type of Change:

- [X] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [ ] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):
- [ ] in cross-listing
- [ ] in degree credit exclusion(s)
- [ ] regularize course (from Special Topics)
- [ ] in course format/mode of delivery *
- [ ] retire/expire course
- [ ]

Change From:	To:
An introduction to biophysics highlighting major themes in pure and applied biophysical research. Included is coverage of fundamental concepts in fluid mechanics. The course will present biology and physics students with an overview of the role of physics in biological research. Prerequisites: SC/PHYS 1010 6.00, or SC/PHYS 1800 3.00 and SC/PHYS 1801 3.00, or a minimum grade of C in SC/PHYS 1410 6.00 or SC/PHYS 1420 6.00, or SC/ISCI 1310 6.00; SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00 or SC/BIOL 1410 6.00, or SC/ISCI 1110 6.00, or permission of Instructor.	An introduction to biophysics highlighting major themes in pure and applied biophysical research. Included is coverage of fundamental concepts in fluid mechanics. The course will present biology and physics students with an overview of the role of physics in biological research. Prerequisites: (1) SC/PHYS 1010 6.00, or SC/ISCI 1310 6.00, or both SC/ISCI 1301 3.00 and SC/ISCI 1302 3.00, or both SC/PHYS 1800 3.00 and SC/PHYS 1801 3.00, or a minimum grade of C in SC/PHYS 1410 6.00 or SC/PHYS 1420 6.00; and (2) both SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00, ~~or SC/BIOL 1410 6.00~~, or SC/ISCI 1110 6.00, or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00; or permission of Instructor.

Rationale: Update to Physics and Biology ISCI listings in prerequisites as well as removing BIOL 1410 that hasn't been offered in over 10 years.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction" information.

From: updbiol <updbiol@yorku.ca>
Subject: Re: BPHS 2090
Date: November 8, 2018 at 12:13:03 PM EST
To: Marshall McCall <chphas@yorku.ca>

Hi Marshall,

Yes, you can let Curriculum know that we approved your changes.

Tamara

From: Physics Chair <chphas@yorku.ca>Date: Wednesday, November 7, 2018 at 2:21 PMTo: updbiol <updbiol@yorku.ca>Cc: Physics Undergraduate Program Director <phasupd@yorku.ca>, Physics Chair <chphas@yorku.ca>Subject: Re: BPHS 2090

Dear Tamara,

Thanks for your message. Should I consider your message to be what I should transmit to the Curriculum Committee of FSc?

Don't know yet hen the split versions will first be offered. The UPD noted that there are a lot of constituents for these courses, so the approval process might take a while. I don't see it being completed by the deadline for this semester. In other words, I think we will be maintaining the status quo in 2019/20.

Best wishes,
Marshall

Marshall L. McCall, Chair
Phone: 416-736-5249
Department of Physics and Astronomy
FAX: 416-736-5516
York University
Internet: chphas@yorku.ca
4700 Keele Street
WebSite: www.physics.yorku.ca
Toronto, Ontario, CANADA
M3J 1P3

On Nov 6, 2018, at 8:43 PM, updbiol <updbiol@yorku.ca> wrote:

Hi Marshall,

I just brought it to the department today and it was approved. That's great news that PHAS will be splitting the first year courses. I think this may be easier for students to fit in their schedule and will definitely be helpful to those who struggled with one half of the course or the other. When will the split versions first be offered – next year?

Tamara

From: Physics Chair <chphas@yorku.ca>Date: Tuesday, November 6, 2018 at 1:58 PMTo: Tamara Kelly <tljkelly@yorku.ca>Cc: Physics Chair <chphas@yorku.ca>, Physics Undergraduate Program Director <phasupd@yorku.ca>Subject: Fwd: BPHS 2090

Dear Tamara,

Greetings.

Did you get my message below? All I need is a confirmation by email from you that the changes to BPHS 2090 are OK to send this forward to the Faculty.

By the way, PHAS voted in favour of splitting all first year offerings. Also, once approved by York, we may decide to offer PHYS 1420 both as a F/W combo and a W/S combo. This way people who fail either half would have a second opportunity in the same year to make it up. The S half would be spread out over S1 and S2 (i.e. as S), which would be less intense and help with learning. If this is done, though, your majors should be notified that those interested in doing physics in the summer would have to start it in the winter.

Best wishes
Marshall

Marshall L. McCall, Chair
Phone: 416-736-5249
Department of Physics and Astronomy
FAX: 416-736-5516
York University
Internet: chphas@yorku.ca
4700 Keele Street
WebSite: www.physics.yorku.ca
Toronto, Ontario, CANADA
M3J 1P3

Begin forwarded message:

From: Marshall McCall <chphas@yorku.ca>
Subject: BPHS 2090
Date: October 17, 2018 at 1:16:45 PM EDT
To: Tamara Kelly <tljkelly@yorku.ca>
Cc: "Chair, Physics and Astronomy" <chphas@yorku.ca>

Dear Tamara,

We finally got around to looking at the BPHS 2090 course change. I made some additional changes to the ISCI part for PHAS. I attach the revised form. If you could send me an email saying that Biology approves of the changes, I will include that when I submit the form to FSc (which I will do right after I hear from you).

As a heads up, PHAS is going to be voting today on whether to split all our first year offerings into two parts (but still retain the old courses as possible options for the summer, e.g.). This will affect calendar copy for Biology wherever you list physics courses as options, including BPHS 2090 down the road.

Best wishes,
Marshall

Marshall L. McCall, Chair
Phone: 416-736-5249
Department of Physics and Astronomy
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COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Faculty of Science
Department: Indicate department and course prefix (e.g. Languages, GER)	Physics and Astronomy
Date of Submission:	Nov
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	PHYS 1011 3.0
Var:	
Academic Credit Weight: Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Physics 1
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Physics 1

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters
(approximately 300 words including spaces and punctuation).

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

Topics include linear, rotational and oscillatory motion; Newtonian mechanics; work and energy; gravitation; waves and sound. Differential calculus and vector algebra are used. This course covers topics in greater depth than SC/PHYS 1411 3.00 or SC/PHYS 1421 3.00. It should be taken by all those likely to enroll in 2000-level physics courses, and is a prequel to SC/PHYS1012 3.0.

Prerequisites: 12U Physics or OAC Physics or SC/PHYS 1510 4.00; MHF4U Advanced Functions and MCV4U Calculus and Vectors, or 12U Advanced Functions and Introductory Calculus, or OAC Algebra and OAC Calculus, or SC/MATH 1505 6.00, or SC/MATH 1520 3.00.

Course credit exclusions: SC/PHYS 1010 6.00; SC/PHYS 1411 3.00, SC/PHYS 1420 6.00; SC/PHYS 1421 3.00; SC/PHYS 1800 3.00; SC/ISCI 1310 6.00; SC/ISCI 1301 3.00.

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

PHYS 1011 is an introductory course for students majoring in physics, astronomy, biophysics, and earth/atmospheric science. It uses a range of practical examples from these fields as the backdrop for providing an in-depth calculus-based introduction to mechanics, oscillations and waves. Specific topics include

1. motion in one, two and three dimensions,
2. forces and Newton's laws,
3. energy, work and power,
4. conservation of energy,
5. gravity,
6. systems of particles,
7. rotational motion and angular momentum,
8. oscillatory motion,
9. wave motion.

Learning Outcomes:

1. Conceptual understanding and problem-solving ability for the topics listed above.
2. An appropriate proficiency in the mathematics required for these physics topics, both algebraic and numeric.
3. Laboratory skills, including the ability to make measurements, analyze data, and draw valid conclusions.
4. Some ability to think critically and work independently.
5. Some ability for scientific communication, both written and oral, and to collaborate with peers.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

Three lectures per week introduce new material, with each lecture emphasizing a specific application of the material to physics, astronomy, biophysics or earth/atmospheric science. Each meeting is a combination of traditional lecture and student participation.

An electronic homework system has been developed to build conceptual, analytic and numerical skills into every homework problem.

Each tutorial (one per week) is structured around a hands-on experiment or a review sheet, always designed to encourage in-person interaction among students, and also between students, teaching assistants, the Bethune peer tutor, and the instructor who are present in the tutorial room.

An online Q&A forum is actively maintained and used by the students and the instructor.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

The course will be offered each fall.

All physics faculty member are competent to teach this course.

In the coming year, it is likely to be taught by Randy Lewis.

This 12-week course has 3 lectures and one tutorial per week. It also has 5 three-hour labs.

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Online homework = 15%
Labs = 10%
Tutorials = 5%
Test #1 = 15%
Test #2 = 15%
Exam = 40%

Alternative arrangements are made for every student with a scheduling conflict during the tutorial time.

Both the academic and lab components must be passed, independent of one another, to pass the course.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

The textbook is
Essential University Physics (volume 1), Richard Wolfson, third edition, 2016.

The online homework system presently used for PHYS 1010 is available to enrolled students at webwork.phys.yorku.ca and is appropriate for the proposed course. An alternative is provided from the textbook publisher.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

The lab equipment and space presently used for PHYS 1010 is available for the proposed course.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

The material in this course is an essential foundation for all courses that follow, for any student majoring in physics, astronomy or biophysics.

The splitting of PHYS 1010 (which is a 6-credit course) into PHYS 1011 (fall) and PHYS 1012 (winter) will add flexibility for students changing from one major to another. It will also add flexibility for students entering from another institution with an equivalent credit for just one half of PHYS 1010.

The enrolment will be equivalent to the typical enrolment of PHYS 1010, presently about 80 students.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
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Accessible format can be provided upon request.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Faculty of Science
Department: Indicate department and course prefix (e.g. Languages, GER)	Physics and Astronomy
Date of Submission:	Nov
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	PHYS 1012 3.0
Var:	
Academic Credit Weight: Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Physics 2
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Physics 2

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters *(approximately 300 words including spaces and punctuation).*

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

A sequel to PHYS1011 3.0. Topics include electrostatics; magnetostatics; electric current, DC circuits, and induction; electromagnetic waves, optics. Differential and integral calculus and vector algebra are used. This course covers fewer topics than SC/PHYS 1411 3.00 or SC/PHYS 1421 3.00, but covers them in greater depth. It should be taken by all those likely to enrol in 2000-level physics courses.

Prerequisite: PHYS1011 3.00, or a minimum grade of C in either PHYS 1411 3.00 or PHYS 1421 3.00; MATH1013 3.00 or equivalent.

Corequisite(s): SC/MATH 1014 3.00, or SC/MATH 1505 6.00, or equivalents.

Course credit exclusions: SC/PHYS 1410 6.00; SC/PHYS 1420 6.00; SC/PHYS 1412 3.00; SC/PHYS 1422 3.00; SC/PHYS 1801 3.00; SC/ISCI 1310 6.00; SC/ISCI 1302 3.00.

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

PHYS 1012 is a first-year course meant to be the natural sequel to PHYS 1011 for students majoring in physics, astronomy, biophysics, and earth/atmospheric science. PHYS 1012 uses a range of practical examples from these fields as the backdrop for providing an in-depth calculus-based introduction to electromagnetism plus a briefer introduction to optics and modern physics. Specific topics include

1. electric charge, electric force, and electric field,
2. Gauss's law,
3. electric potential,
4. electrostatic energy and capacitors,
5. electric current and electric circuits,
6. magnetic force and magnetic field,
7. electromagnetic induction,
8. electromagnetic waves,
9. interference and diffraction in optics and quantum physics.

Learning Outcomes:

1. Conceptual understanding and problem-solving ability for the topics listed above.
2. An appropriate proficiency in the mathematics required for these physics topics, both algebraic and numeric.
3. Laboratory skills, including the ability to make measurements, analyze data, and draw valid conclusions.
4. Some ability to think critically and work independently.
5. Some ability for scientific communication, both written and oral, and to collaborate with peers.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

Three lectures per week introduce new material, with each lecture emphasizing a specific application of the material to physics, astronomy, biophysics or earth/atmospheric science. Each meeting is a combination of traditional lecture and student participation.

An electronic homework system has been developed to build conceptual, analytic and numerical skills into every homework problem.

Each tutorial (one per week) is structured around a hands-on experiment or a review sheet, always designed to encourage in-person interaction among students, and also between students, teaching assistants, the Bethune peer tutor, and the instructor who are present in the tutorial room.

An online Q&A forum is actively maintained and used by the students and the instructor.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

The course will be offered each winter semester.

All physics faculty members are competent to teach this course.

In the coming year, it is likely to be taught by Randy Lewis.

This 12-week course has 3 lectures and one tutorial per week. It also has 5 three-hour labs.

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Online homework = 15%
Labs = 10%
Tutorials = 5%
Test #1 = 15%
Test #2 = 15%
Exam = 40%

Alternative arrangements are made for every student with a scheduling conflict during the tutorial time.

Both the academic and lab components must be passed, independent of one another, to pass the course.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

The textbook is
Essential University Physics (volume 2), Richard Wolfson, third edition, 2016.

The online homework system presently used for PHYS 1010 is available to enrolled students at webwork.phys.yorku.ca and is appropriate for the proposed course. An alternative is provided from the textbook publisher.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

The lab equipment and space presently used for PHYS 1010 is available for the proposed course.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

The material in this course is an essential foundation for all courses that follow, for any student majoring in physics, astronomy or biophysics.

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The enrolment will be equivalent to the typical enrolment of PHYS 1010, presently about 80 students.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
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Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Faculty of Science
Department: Indicate department and course prefix (e.g. Languages, GER)	Physics and Astronomy
Date of Submission:	Nov
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	PHYS 1411 3.0
Var:	
Academic Credit Weight: Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Physics Fundamentals 1
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Physics Fundamentals 1

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters *(approximately 300 words including spaces and punctuation).*

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

A calculus-based survey of physics. Topics include kinematics, dynamics, momentum and energy for linear and rotational motion; elementary kinetic theory and thermodynamics. This course is recommended for students unlikely to take 2000-level Physics courses. It is a prequel to PHYS 1412 3.0

Prerequisites: 12U Physics or OAC Physics or SC/PHYS 1510 4.00; MHF4U Advanced Functions and MCV4U Calculus and Vectors, or 12U Advanced Functions and Introductory Calculus, or OAC Algebra and OAC Calculus, or SC/MATH 1505 6.00, or SC/MATH 1520 3.00.

Course credit exclusions: SC/PHYS 1010 6.00; SC/PHYS 1011 3.00, SC/PHYS 1420 6.00; SC/PHYS 1421 3.00; SC/PHYS 1800 3.00; SC/ISCI 1310 6.00; SC/ISCI 1301 3.00.

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

PHYS 1411 will cover fundamental topics in mechanics and thermal physics. Laboratory experiments will be an integral part of course.

The first concepts covered in the course will related to labs, especially uncertainty in measured quantities, uncertainty in calculated quantities and significant figures.

Math is the language of physics and two lectures will be devoted to reviewing basic concepts in trigonometry, vectors and differential calculus.

The following fundamental topics in mechanics and thermal physics will be covered:

Kinematics: Motion in one and two dimensions, including projectile and circular motions.
Forces and motion (Newton's Laws and free-body force diagrams).
Static and kinetic friction.
Work, energy and the Law of Conservation of Mechanical Energy.
Momentum, impulse, conservation of momentum and collisions.
Torque and rotational dynamics, including angular velocity, angular acceleration and moment of inertia.
Coplanar static equilibrium.
Oscillations, especially the spring-mass system.
Mechanical travelling and standing waves, including sound.
Elementary Kinetic Theory of Gases (gas pressure, ideal gas equation, mean-root-square speed, thermal energy).
Introductory Thermodynamics: First Law of Thermodynamics.

COURSE LEARNING OUTCOMES:
By the end of the course, students will be able to:

- Solve problems and collect/analyze experimental data related to Newton's Laws and kinematics.
- Use work-kinetic energy theorem and the law of conservation of mechanical energy to solve problems in mechanics.
- Use the momentum-impulse theorem and conservation of linear momentum to solve problems and collect/analyze experimental data related to collisions.
- Solve problems related to static equilibrium and rotational dynamics
- Solve problems and collect/analyze experimental data related to vibrations and mechanical waves.
- Solve problems and collect/analyze experimental data related to thermal physics.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

The course will consist of lectures (three per week), tutorials (one per week) and labs (five three-hour long labs).

In addition to lectures and tutorials, the course instructors will keep office hours to provide help to students.

Peer-to-peer study sessions as well as online study groups will be organized to facilitate learning.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

The course will be offered every year in the fall semester (one section).

All members of the department (24 in total) are qualified to teach the course but most likely one of the professors in the teaching stream will be the course instructor:
Paul Delaney
Matthew George
Stan Jerzak

The length of the course will be 12 weeks, with four contact hours per week (three lectures and one tutorial). In addition, students will be required to complete 5 three-hour long labs in alternate weeks.

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

There will be three term tests (each 50 minutes long): 3x15% = 45% of the final grade.

Weekly online assignments: 10%

Labs: 15%

Final examination (three-hour long): 30%

Both the academic and lab components must be passed, independent of one another, to pass the course.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

Students will use the following textbook:

Fundamentals of Physics, by Halliday, Resnick and Walker, 9th edition, Wiley.

The Laboratory manual will be available online.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

Physics laboratory and lab equipment are available from PHYS1410 6.00.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

PHYS 1411 will be a service course. The course clientele will be students majoring in science programs such as: chemistry, computer science and mathematics. It is expected that the course will also attract students from other faculties as well, especially the Faculty of Health.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Faculty of Science
Department: Indicate department and course prefix (e.g. Languages, GER)	Physics and Astronomy
Date of Submission:	Nov
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	PHYS 1412 3.0
Var:	
Academic Credit Weight: Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Physics Fundamentals 2
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Physics Fundamentals 2

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters *(approximately 300 words including spaces and punctuation).*

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

A calculus-based survey of physics and sequel to PHYS 1411 3.0. Topics include static and current electricity; waves and physical and geometrical optics; elements of modern physics. This course is recommended for students unlikely to take 2000-level Physics courses.

Prerequisites: SC/PHYS 1411 3.00 or SC/PHYS1421 3.00 or SC/PHYS1011 3.00 or SC/PHYS 1800 3.00.

Course credit exclusions: SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00; SC/PHYS 1012 3.00, SC/PHYS 1422 3.00; SC/PHYS 1801 3.00; SC/ISCI 1310 6.00; SC/ISCI 1302 3.00.

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

PHYS 1412 will cover fundamental topics in electricity, magnetism and optics. A few selected topics in modern physics will be included in the course as well. Laboratory experiments will help students to enhance understanding of physics concepts and teach them skills such as making measurements using various instruments.

The following fundamental topics will be covered in the course:
Electric charges, electric force and electric field.
Electrical potential energy and the electric potential difference.
Electric current and direct current (DC) circuits.
Capacitors and their applications, including RC circuits.
Magnetic materials, magnetic field and magnetic forces (including applications such as DC electric motors).
Faraday's Law of Electromagnetic Induction and its applications, for example, electric generators.
Spectrum and nature of electromagnetic waves and their polarization.
Reflection and refraction of light.
Mirrors and lenses and their applications (for example, microscope, telescope and other optical instruments).
Interference and diffraction of light.
Lasers and their applications.
Elements of nuclear physics (radioactive decay, fission nuclear reaction, nuclear power plants, radiation and health).

COURSE LEARNING OUTCOMES
By the end of the course, students will be able to:
-Determine forces, electric field and electric potential difference due to electric charges.
-Analyze DC circuits using Ohm's Law and Kirchhoff's rules, connect circuits and measure resistance, current and voltage using a digital multi-meter.
-Solve problems and conduct experiments related to capacitors and RC circuits.
-Solve problems and conduct lab experiments related to magnetic forces and electromagnetic induction.
-Solve problems and conduct lab measurements using lenses and mirrors.
-Solve problems and perform lab experiments related to polarization, refraction, diffraction and interference of light.
-Solve problems related to nuclear physics.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

The course will consist of lectures (three per week), tutorials (one a week) and labs (six three-hour long labs).

In addition to lectures and tutorials, the course instructors will be keep office hours to provide help to students.

Peer-to-peer study sessions as well online study groups will be organized to facilitate learning.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

The course will be offered every year in the winter semester (one section).

All members of the department (24 in total) are qualified to teach the course but most likely one of the professors in the teaching stream will be the course instructor:
Paul Delaney
Matthew George
Stan Jerzak

The length of the course will be 12 weeks, with four contact hours per week (three lectures and one tutorial). In addition, students will be required to complete 6 three-hour long labs in alternate weeks.

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

There will be three term tests (each 50 minutes long): 3x15% = 45% of the final grade.

Weekly online assignments: 10%

Labs: 15%

Final examination (three-hour long): 30%

Both the academic and lab components must be passed, independent of one another, to pass the course.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

Students will use the following textbook:

Fundamentals of Physics, by Halliday, Resnick and Walker, 9th edition, Wiley.

The Laboratory manual will be available online.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

Physics laboratory and lab equipment are available from PHYS1410 6.00.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

PHYS 1412 will be a service course. The course clientele will be students majoring in science programs such as: chemistry, computer science and mathematics. It is expected that the course will also attract students from other faculties as well, especially the Faculty of Health.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Faculty of Science
Department: Indicate department and course prefix (e.g. Languages, GER)	Physics and Astronomy
Date of Submission:	Nov
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	PHYS 1421 3.0
Var:	
Academic Credit Weight: Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Physics with Life Science Applications 1
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Physics with Life Science Applications 1

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters *(approximately 300 words including spaces and punctuation).*

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

Fundamental physics concepts are emphasized through applications to the life sciences.
Topics include linear and rotational motion; Newtonian mechanics; work and energy; fluid statics and dynamics.
Differential calculus and vector algebra are used.
This course is recommended for students unlikely to enroll in 2000-level physics courses, and is a prequel to SC/PHYS1422 3.00.

Prerequisites: 12U Physics or OAC Physics or SC/PHYS 1510 4.00; MHF4U Advanced Functions and MCV4U Calculus and Vectors, or 12U Advanced Functions and Introductory Calculus, or OAC Algebra and OAC Calculus, or SC/MATH 1505 6.00, or SC/MATH 1520 3.00.

Course Credit Exclusions: SC/PHYS 1010 6.00 SC/PHYS 1011 3.00; SC/PHYS 1410 6.00; SC/PHYS 1411 3.00; SC/PHYS 1800 3.00; SC/ISCI 1310 6.0; SC/ISCI 1301 3.00.

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

This first-year physics course is intended to be taken by science majors who are not Physics, Biophysics, Space Science, or Engineering majors. It serves a similar purpose as PHYS1411, but tailors examples and topics to suit the interests of Life-Science majors. Broad topics covered include 1) Motion in one, two and three dimensions; 2) Newton's Laws; 3) Work and Energy; 4) Linear momentums, Collisions, and Systems of Particles; 5) Rotational Dynamics; 6) Fluid Statics and Dynamics.

Learning Outcomes include:

1) Explain Newton's laws of motion and the relationship between force, mass, and motion
2) Relate the principle of conservation of mechanical energy to the work done by a constant force, variable force and a spring.
3) Apply the laws of conservation of momentum and energy to collisions
4) Solve rotational dynamics problems using the work-conservation of mechanical energy approach, the force-torque approach, and using conservation of angular momentum
5) Explain and solve problems related to the fluid concepts of pressure, buoyancy, Pascal's Principle, continuity of flow, and viscous flow.
6) Discover the benefits of peer collaboration, and describe best practices for performing careful laboratory measurements.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

This course will be delivered in a face-to-face format. Lectures will involve a mix of concept presentation, demonstrations, and problem solving strategies. Students will be challenged throughout the lectures to answers conceptual-based questions, and to set-up problem solving solutions. Elements of peer learning will be integrated into these student activities.

Tutorials will reinforce previously presented concepts through the solving of problems, reviewing of challenging concepts, and reviewing material for tests and exams. These sessions will typically integrate greater student activity than lectures.

Student learning will be greatly enhanced through the inclusion of an online homework assessment tool that incentivizes students to keep up with course material. The structure of this tool will easily allow the instructor to gauge with which concepts the students are struggling.

Course material will be hosted on Moodle, including lecture slides. This will not only allow students an opportunity to review past lectures, but also allow students look ahead and prepare for future meetings.

Laboratory sessions provide students an opportunity to work in groups, develop careful laboratory technique, and provide opportunity for consolidating, analyzing and presenting data.

Typically, one Bethune College Peer mentor is assigned to this course.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time

1. One section in the Fall term, and one section in the SU1 term.
2. All physics faculty members should be competent to teach this course.
3. Matthew George, Stan Jerzak, Cody Storry
4. In Fall Term: 3 lecture hours and one tutorial hour per week, 5 three-hour lab sessions throughout the term.

   In SU1 Term: 6 lecture hours per week, one tutorial hour per week, 5 three-hour lab sessions throughout the term.

students are likely to spend engaged in learning activities required by the course.

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Online Homework Assessments: 10%
Labs: 10%
Tests (2): 20% each
Exam: 40%

Both the academic and Lab components must be passed, independent of one another, to pass the course.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

Required:
Kesten & Tauck, *University Physics for the Physical and Life Sciences*, Freeman (2012)

Online Resources:
Sapling Leaning, Interactive Homework and Instruction. To be used for the homework assignments.

Selected online resources from Khan Academy and PhET simulations

- www.khanacademy.org
- https://phet.colorado.edu

These resources have previously been successfully used as part of PHYS1420 6.00.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

Laboratory space already exists (Bethune 102C and 102D) and has the capacity to serve the expected enrollment.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

The existing 6-credit PHYS1420 6.00 course is being split into two 3-credit courses, PHYS1421 and PHYS1422. This split will serve to add flexibility for students who perform poorly in the first 3-credits not to be burdened with having paid for a full 6-credit course. Furthermore, this split will allow more flexibility in the assignment of course directors.

This course serves as the science breadth requirement for many non-physics-related programs in the Faculty of Science. Furthermore, many students choose this course to fulfill a pre-requisite for applying to professional schools or to prepare for professional qualification exams.

There is overlap with PHYS1411, however the combined enrolment of the PHYS1411 and PHYS1421 would greatly exceed the largest available room on campus. Rather than just, for example, splitting PHYS1411 into two manageable sections, PHYS1421 is particularly designed to better serve the needs and interests of Life-Science-related majors.

The expected enrollment in the Fall term is 400, and in the Summer term is 200.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Faculty of Science
Department: Indicate department and course prefix (e.g. Languages, GER)	Physics and Astronomy
Date of Submission:	Nov
Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	PHYS 1422 3.0
Var:	
Academic Credit Weight: Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Physics with Life Science Applications 2
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Physics with Life Science Applications 2

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters *(approximately 300 words including spaces and punctuation).*

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

A sequel to PHYS1421 3.0 in which fundamental concepts are emphasized through applications to the life sciences.
Topics include electrostatics; DC circuits; magnetic fields; induction; oscillation and waves, electromagnetic waves; optics.
Differential calculus and vector algebra are used.
This course is recommended for students unlikely to enrol in 2000-level physics courses.

Prerequisites: SC/PHYS 1421 3.00 or SC/PHYS1411 3.00 or SC/PHYS1011 3.00 or SC/PHYS 1800 3.00.

Course credit exclusions: SC/PHYS 1010 6.00, SC/PHYS1410 6.00, SC/PHYS 1420 6.00; SC/PHYS 1012 3.00, SC/PHYS 1412 3.00; SC/PHYS 1801 3.00; SC/ISCI 1310 6.00; SC/ISCI 1302 3.00.

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

This first-year physics course is intended to be taken by science majors who are not Physics, Biophysics, Space Science, or Engineering majors. It serves a similar purpose as PHYS1412, but tailors examples and topics to suit the interests of Life-Science majors. Broad topics covered include 1) Electricity and Circuits; 2) Magnetic Fields; 3) Electromagnetic Induction; 4) Oscillations, Waves, and Electromagnetic Waves 5) Wave and Geometric Optics

Learning Outcomes include:

1) Explain the concepts of Electric Force, Electric Field, Electric Potential and Electric Potential Energy and solve related problems.
2) Apply fundamental principles to the investigation of direct-current circuits.
3) Describe magnetic fields, and determine the forces on a charged particle moving in electric and magnetic fields.
4) Apply Faraday's law of electromagnetic induction to situations with changing magnetic flux.
5) Describe light as an electromagnetic wave and investigate situations of wave interference
6) Apply the principles of geometric optics to lens and mirror systems.
7) Discover the benefits of peer collaboration, and describe best practices for performing careful laboratory measurements.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

This course will be delivered in a face-to-face format. Lectures will involve a mix of concept presentation, demonstrations, and problem solving strategies. Students will be challenged throughout the lectures to answers conceptual-based questions, and to set-up problem solving solutions. Elements of peer learning will be integrated into these student activities.

Tutorials will reinforce previously presented concepts through the solving of problems, reviewing of challenging concepts, and reviewing material for tests and exams. These sessions will typically integrate greater student activity than lectures.

Student learning will be greatly enhanced through the inclusion of an online homework assessment tool that incentivizes students to keep up with course material. The structure of this tool will easily allow the instructor to gauge with which concepts the students are struggling.

Course material will be hosted on Moodle, including lecture slides. This will not only allow students an opportunity to review past lectures, but also allow students look ahead and prepare for future meetings.

Laboratory sessions provide students an opportunity to work in groups, develop careful laboratory technique, and provide opportunity for consolidating, analyzing and presenting data.

Typically, one Bethune College Peer mentor is assigned to this course.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time

1. One section in the Winter term, and one section in the SU2 term.
2. All physics faculty members should be competent to teach this course.
3. Matthew George, Stan Jerzak, Cody Storry
4. In Winter Term: 3 lecture hours and one tutorial hour per week, 5 three-hour lab sessions throughout the term.

   In SU2 Term: 6 lecture hours per week, one tutorial hour per week, 5 three-hour lab sessions throughout the term.

.students are likely to spend engaged in learning activities required by the course.

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Online Homework Assessments: 10%
Labs: 10%
Tests (2): 20% each
Exam: 40%

Both the academic and Lab components must be passed, independent of one another, to pass the course.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

Required:
Kesten & Tauck, *University Physics for the Physical and Life Sciences*, Freeman (2012)

Online Resources:
Sapling Leaning, Interactive Homework and Instruction. To be used for the homework assignments.

Selected online resources from Khan Academy and PhET simulations

- www.khanacademy.org
- https://phet.colorado.edu

These resources have previously been successfully used as part of PHYS1420 6.00.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

Laboratory space already exists (Bethune 102C and 102D) and has the capacity to serve the expected enrollment.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

The existing 6-credit PHYS1420 6.00 course is being split into two 3-credit courses, PHYS1421 and PHYS1422. This split will serve to add flexibility for students who perform poorly in the first 3-credits not to be burdened with having paid for a full 6-credit course. Furthermore, this split will allow more flexibility in the assignment of course directors.

This course serves as the science breadth requirement for many non-physics-related programs in the Faculty of Science. It is the successor to PHYS1421. Furthermore, many students choose this course to fulfill a pre-requisite for applying to professional schools or to prepare for professional qualification exams.

There is overlap with PHYS1412, however the combined enrolment of the PHYS1412 and PHYS1422 would greatly exceed the largest available room on campus. Rather than just, for example, splitting PHYS1412 into two manageable sections, PHYS1422 is particularly designed to better serve the needs and interests of Life-Science-related majors.

The expected enrollment in the Winter term is 400, and in the Summer term is 200.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.

YORK
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Memorandum

To: Paula Wilson, Chair, Science Faculty Council

From: Lyndon Martin, Chair, Search Committee for Dean of Science

Date: November 29, 2018

Subject: Search for Dean, Faculty of Science: **Invitation for Input to Position Profile**

PLEASE SHARE THIS INFORMATION AND INVITATION FOR INPUT WITH MEMBERS OF SCIENCE FACULTY COUNCIL.

As you know, a search committee has been established to provide a recommendation to the President with regard to the appointment of the next Dean of the Faculty of Science, with an appointment anticipated effective July 1, 2019. The Provost has asked me to chair the search committee; and its members are listed at the end of this communication.

The search committee has retained the services of consultants Gordon Lobay and Caroline McLean of Perrett Laver to assist us in presenting this exciting opportunity to potential candidates and in canvassing widely nationally and internationally for outstanding applicants to enable us to consider a range of excellent candidates for this important position.

An advertisement of the position has been finalized and placed in a range of venues; and the search committee has been working with our consultants towards the development of a draft position profile. This is a very important document intended to serve two major purposes: first, to provide potential candidates with an understanding of the Faculty (its strengths and distinctive aspects, opportunities and challenges, and aspirations for the future), the responsibilities of the Dean, and the experiences, qualifications, capacities, etc. we are seeking in the next Dean; and second, to provide the search committee with a "measure" against which to assess the applications of potential candidates.

A draft of the position profile is attached. Before finalizing this document, we would welcome input from members of the Science Faculty Council, including faculty, staff and student members, on the draft – in particular on whether it clearly and effectively presents to potential candidates the Faculty's strengths, challenges and opportunities and the qualifications and characteristics sought in candidates. We would also welcome suggestions of distinctive and outstanding academic programs – and/or new program directions - that might be highlighted in the section on the Faculty's programming (p. 7).

Comments can be directed to the committee's secretary, Marla Chodak at mchodak@yorku.ca, by 5:00 PM on Thursday, December 6, 2018. Input will be provided to the search committee and will be incorporated into a next draft of the profile, which will be shared with Faculty Council for information and any final comments at its December 11 meeting.

The search committee will be seeking candidates internally and externally, locally, nationally and internationally. In order to support a wide canvas, therefore, the committee would very much welcome suggestions of potential candidates who could be approached by the search consultants; this information can be sent at any time to the committee's secretary or directly to our consultants at Gordon.Lobay@perrettlaver.com or Caroline.McLean@perrettlaver.com.

On behalf of the search committee, thank you for taking the time to review the draft and provide input at this busy time of year.

Membership of the Search Committee:
Lyndon Martin, Dean, Faculty of Education (Chair)
Gary Sweeney (Biology)
Cora Young (Chemistry)
Juris Steprans (Mathematics & Statistics)
Michael De Robertis (Physics & Astronomy)
Christopher Bergevin (Physics & Astronomy)
Mary Helen Armour (Science and Technology Studies)
Parissa Safai (Kinesiology & Health Science, Faculty of Health) – President's Designate
Helen McLellan (Executive Officer, Office of the Dean – staff representative)
Paige Whyte-Fagundes (Biology Graduate Student)
Robert Cheung (Biology Undergraduate student)
Marla Chodak, Provost's Office (non-voting secretary)

Search Consultants: Gordon Lobay and Caroline McLean (Perrett Laver)

Draft for Faculty Council Consultation

York University

Appointment of Dean, Faculty of Science

Draft Appointment Details Text – November 2018

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Perrett Laver

AMERICAS ASIA PACIFIC EMEA

Introduction

Perrett Laver

AMERICAS ASIA PACIFIC EMEA

The Faculty of Science at York University is seeking a new Dean. Established in 1965, the Faculty has grown substantially over the years, earning a global reputation for cutting-edge research and innovation. The Faculty's five departments and one division form the organizational home for some 140 faculty members and over 20 academic programs at the undergraduate and graduate levels, reflecting the breadth and interdisciplinarity of the Faculty's activities. As a hub of research and teaching excellence, the Faculty of Science fosters scientific discovery in the life, physical and quantitative sciences and prepares global thinkers to advance knowledge across a range of disciplines.

The Faculty is committed to enhancing the student experience and to fostering student learning through innovative teaching practices and experiential education opportunities. Students at all levels in the Faculty learn from and work with outstanding faculty members, and benefit from leading-edge research facilities.

Faculty members collaborate with colleagues across campus, at other local institutions and around the world in academia, industry and government, and also engage with the broader community through extensive outreach activities and media. Many faculty members are also affiliated with several Organized Research Units at York University and contribute to cross-Faculty research initiatives such as VISTA (Vision: Science to Applications) and the CVR (Center for Vision Research). Faculty of Science researchers attract funding from a broad array of agencies including NSERC, CIHR, and CFI.

The Faculty is now seeking a visionary and collaborative Dean to build on its successes and lead its next phase of development. Following a period of considerable growth and success, the Dean will have the opportunity to guide the Faculty's future direction, giving attention to planning for and advancing growth, building new partnerships, and enhancing both research and the student learning experience. Working with a supportive and high-caliber faculty, the Dean will have the opportunity to devise and deliver a forward-thinking strategy for the Faculty. The ideal candidate will have a track record of academic achievement, and strategic and consultative leadership in a multidisciplinary environment. They will be a person with strong communication and leadership skills, inspired vision, exceptional character, and a passionate commitment to the values and mission of the Faculty and the University. The incoming Dean will have the opportunity to lead a thriving and impactful Faculty of Science, one which pushes the bounds of innovation. For more information about the Faculty, see http://science.yorku.ca/.

Home to 52,000 students, York University has an established international reputation as a global, research-intensive university committed to interdisciplinarity, innovation, social justice, equity, and diversity. York has several campuses in the Greater Toronto Area and internationally. Please visit www.yorku.ca for additional information about the University.

About York University

Mission

> The mission of York University is the pursuit, preservation, and dissemination of knowledge. We promise excellence in research and teaching in pure, applied and professional fields. We test the boundaries and structures of knowledge. We cultivate the critical intellect.
>
> York University is part of Toronto: we are dynamic, metropolitan and multi-cultural. York University is part of Canada: we encourage bilingual study, we value diversity. York University is open to the world: we explore global concerns.
>
> A community of faculty, students, staff, alumni and volunteers committed to academic freedom, social justice, accessible education, and collegial self-governance, York University makes innovation its tradition.
>
> *Tentanda Via:* The way must be tried.

York's vision, values and directions are more fully articulated in a number of institutional planning documents, which are integrated around shared commitments to advancing the research culture, offering high quality innovative academic programs, enhancing our students' educational experience, promoting engagement with local, national and international communities, and fostering diversity and inclusivity; and which provide a framework for planning around exciting new initiatives at the Faculty level. These documents include:

- The University Academic Plan: http://secretariat.info.yorku.ca/files/UAP-2015-2016-Final.pdf
- The Strategic Research Plan http://research.info.yorku.ca/files/2018/07/Final-SRP-2018-2023.pdf
- The Indigenous Framework http://indigenous.yorku.ca/files/2017/08/Indigenous-Framework-for-York-University-A-Guide-to-Action.pdf

York University is a vibrant, diverse community of scholars located in the heart of the Greater Toronto Area and connected to downtown Toronto by a new subway line. York is Canada's third largest university with over 52,000 undergraduate and graduate students including 6,200 international students, 7,000 faculty and staff, more than 300,000 alumni, and a budget in excess of one billion dollars per annum. York has established its reputation worldwide as one of Canada's largest and most multicultural universities. With more than 290 student clubs and organizations, the intellectual, cultural and social life at York is one of the richest in Canada.

In addition to the Faculty of Science, York is home to 10 other Faculties:

- Osgoode Hall Law School, Canada's pre-eminent law school and the largest common-law law school in the country;
- The first and largest comprehensive School of Arts, Media, Performance & Design (formerly the Faculty of Fine Arts) in Canada;
- Glendon College, a small bilingual liberal arts college with its own campus;
- The Schulich School of Business, which is rated among the world's leading business schools;
- The Lassonde School of Engineering, home of the Renaissance Engineer, with programs in engineering, computing, earth & space science, including Canada's first space engineering program;
- The Faculty of Liberal Arts & Professional Studies which offers Canada's most comprehensive range of programs in the social sciences, the humanities and related professional fields;
- An internationally-recognized Faculty of Environmental Studies dedicated to interdisciplinary environmental studies, the first of its kind in Canada when it was created in 1968;
- The Faculty of Health, dedicated to social responsibility and the education of future global leaders in redefining and advancing health and human science;
- The Faculty of Education, one of the largest in Ontario and known for its multifaceted and provocative learning experience for pre-service and practicing teachers;
- The Faculty of Graduate Studies which provides an overarching governance and support structure for graduate studies in course-based and thesis-based programs at the University.

Campuses

Founded in 1959 and located on several campuses, York is a comprehensive university, committed to giving a broad demographic of students access to a research-intensive, high-quality education with diverse experiential learning opportunities in innovative learning environments, unique cross-disciplinary programming, and community-engaged research opportunities. York's primary campus, the Keele Campus, is located in the heart of the Greater Toronto Area. It is the largest post-secondary campus in Canada with most of the University's Faculties residing there. Glendon College, Southern Ontario's only bilingual university campus, is a liberal arts Faculty located in the midtown Toronto neighbourhood of Lawrence Park. York also has two locations in downtown Toronto: The Miles S. Nadal Centre and the Osgoode Professional Development Centre, as well as international locations in India, China and Costa Rica.

Student Experience at York University

York offers over 200 degree programs at the undergraduate and graduate levels. Its partnerships with international universities provide opportunities for study abroad, exchanges, research collaborations and community engagement. The University's objective is to introduce students to a broad perspective on the world that results in globally educated citizens equipped to contribute to the 21st century knowledge economy and society. A flexible interdisciplinary approach provides students with an outstanding variety of academic opportunities where learning and debate are not only valued, they are encouraged.

Research Strength

As a globally recognized research institution, York is fully engaged in the critical discussions that lead to innovative solutions to the most pressing local and global social challenges. Over the past ten years, research at York has flourished, with one of the highest rates of growth in research publications and scholarly outputs in Ontario.

York's 11 Faculties and 25 research centres are home to 36 Canada Research Chairs in a diverse range of disciplines. Across the University, researchers work with a view towards partnership, community engagement and impact.

To learn more about York University visit the following link: www.yorku.ca/web/index.htm

The President and Vice-Chancellor of York University is Dr. Rhonda Lenton: http://president.yorku.ca/about-us/bio/

The Provost and Vice-President Academic of York University is Dr. Lisa Philipps:

http://vpap.info.yorku.ca/our-team/lisa-philipps/

About the Faculty of Science

For five decades, the Faculty of Science at York University has been pushing the boundaries of discovery, innovation, learning, engagement and impact. York University has offered courses and programs in the sciences since its founding in 1959, and the Faculty of Science was formally established in 1965, offering programs in Biology, Chemistry and Physics. Since then the Faculty has grown and evolved; so too has its reputation for cutting-edge research in areas such as proteomics and genomics, astronomy and space science, high energy and atomic physics, pure and applied mathematics, and ecology. In 1989, the Faculty was renamed the Faculty of Pure and Applied Science in recognition of the breadth of its programs, and in 2004 it became the Faculty of Science and Engineering, reflecting the expansion of its engineering programs. In May 2013, York University established a separate Faculty of Engineering – the Lassonde School of Engineering – which led to the creation of the current Faculty of Science.

Today, the Faculty is a hub of research and teaching excellence fostering scientific discovery and preparing global thinkers to advance knowledge and human progress. It prides itself on its vision of "Fostering discovery. Engaging community. Inspiring humanity." The Faculty offers a suite of 21 undergraduate programs and 6 graduate programs to 3,600 Undergraduate students and 375 graduate students. Students at all levels learn from and work with outstanding faculty members, and benefit from leading-edge research facilities. Faculty have the opportunity to collaborate with colleagues at other local institutions and around the world in academia, industry and government, and also engage with the community at large through extensive outreach activities and media. Last year, colleagues in the Faculty received over $17.1 million in research funding.

The Faculty is organised into five departments – Biology, Chemistry, Mathematics and Statistics, Physics and Astronomy, Science and Technology Studies. These departments are the home to most undergraduate and graduate degree programs and to the research and teaching faculty and staff. The Division of Natural Science also offers general education science courses to non-science students from other Faculties of the University. In addition, the Department of Geography, housed in the Faculty of Liberal Arts & Professional Studies, is home to the BSc programs in environmental science and geography.

Research

York University is proud to be ranked 8th in Canada for research productivity and impact in the Sciences. The Faculty is home to seven Canada Research Chairs, two named research Chairs, and nine York Research Chairs. Additionally, with annual funding levels averaging $15m, researchers in the Faculty of Science attract funding from a broad array of agencies including NSERC, CIHR, and CFI. Below is a listing of key areas of research within the Faculty of Science organized by Department:

Biology
Research in the Biology Department is focused on several broad areas, promoting interdisciplinary exploration across several fields: molecular and cellular biology; neuroscience, intvertebrate, vertebrate and plant physiology; and ecology and evolution. The department's innovative open concept labs foster the sharing of resources and development of collaborative networks within and beyond the department.

Chemistry
Research in the Department of Chemistry tackles modern problems underpinned by a foundation in fundamental chemistry. This work is enabled by state-of-the-art facilities and an extensive suite of research strengths including advancing human health through chemistry, exploring the formation and prevention of pollution, and developing materials and processes for a sustainable future.

Physics and Astronomy
Research in the Department of Physics and Astronomy covers a wide array of areas, both experimental and theoretical. Current areas of focus include: Astronomy, Astrophysics, and Planetary Physics; Astro-particle and High-Energy Physics; Biological Physics; Atomic, Molecular & Optical Physics, and Chemical & Condensed Matter Physics. Researchers use state-of-the-art facilities to understand the fundamental nature and structure of matter on all scales.

Mathematics & Statistics
Research interests of faculty in the department are quite broad and include many areas in pure mathematics, applied mathematics and statistics. The department is home to a number of important research clusters including the Laboratory for Industrial and Applied Mathematics, The Risk and Insurance Studies Centre, The Centre for Disease Modelling, and others.

Science and Technology Studies
STS researchers explore interdisciplinary studies, encompassing the role of science, technology, and innovation in societies, cultures, and economies.

Researchers in the Faculty of Science are affiliated with several Organized Research Units. These Units promote collaborative, multidisciplinary research across Departments and Faculties. They also provide unique training opportunities to students and postdoctoral fellows. Many of the Centres are engaging with industry and community-based partners to move research from the laboratory to entrepreneurial innovations and real-life applications. Researchers in the Faculty of Science are affiliated with the following Research Centres and Institutes:

- Centre for Research on Biomolecular Interactions
- Centre for Research in Mass Spectrometry
- York Institute for Health Research

- The Centre for Vision Research
- Muscle Health Research Centre
- The Centre for Disease Modelling
- Risk and Insurance Studies Centre

Colleagues in the Faculty also contribute to cross-Faculty research initiatives such as the CFREF-supported VISTA (Vision: Science to Applications), which, in collaboration with partnerships worldwide, brings York's internationally renowned interdisciplinary expertise in visual neuroscience and computer vision to the advancement of applications for visual health and technologies. In addition, faculty are involved in research networks such as the University Health Network.

Teaching and Academic Programs

The Faculty offers several initiatives to promote and support best practises and innovative approaches to teaching within the Faculty of Science, including workshops for instructors/TAs, the science education seminar series hosting experts in pedagogy, and the science education journal club. The Faculty puts an emphasis on the recognition of teaching excellence within the Faculty through the Faculty of Science Excellence in Teaching Awards, and through facilitating nominations for external teaching awards.

Additionally, the Faculty is home to a wide range of innovative programs, and is currently engaged in the development of new program directions in areas such as neuroscience and medical biotechnology.

The Faculty of Science provides a rich diversity of opportunities for students to engage in Experiential Education (EE). EE is about exploring and experiencing the ideas learned in class through concrete experiences, including co-ops and internships – which could be in the classroom (or lab), at an organization or company, or in the community.

The Faculty has recently launched a new Integrated Science initiative, aimed at expanding experiential opportunities for undergraduate students through an enriched first-year experience offered to a small cohort of York Science students. Concepts in biology, chemistry, physics, and mathematics are connected in the context of current scientific frontiers and real-world issues to help students develop a deeper understanding of each discipline through their interdisciplinary connections.

Science Engagement

Science is a source of fascination and aspiration for many people, both young and old. With this in mind, the Faculty of Science has developed a wide range of programs designed to promote STEM (science, technology, engineering and mathematics) education at all levels. This includes hosting a range of public events and lecture series on a range of topics, working with classrooms on in-school workshops, and an advanced enrichment summer course for high school students.

Science engagement programs offer innovative and engaging programs designed to inspire youth and discover exciting topics in STEM disciplines through a discovery and inquiry-based learning approach that is focused on 'learning by doing'. Programs are offered to public and high school students within their schools, in hands-on workshops, and in summer camps.

The Allan I. Carswell Chair for the Public Understanding of Astronomy, established in 2018 and thought to be the first of its kind in North America, is dedicated to science engagement and outreach, designed to benefit students and the public through education and activities, involving telescopes at the Allan I. Carswell Observatory, as well as novel technologies such as virtual reality.

As a part of its commitment to science communication and community engagement, York Science also hosts the Science Communicator in Residence Program, which immerses outstanding science journalists and communicators in the academic scientific environment of the Faculty thereby promoting excellence in science-related communications and the development of graduate students' skills. Communicators for 2018-19 are Molly Segal, B.D. Colen and Dan Falk.

Resource and Strategic Plans

In 2015 the Faculty developed a Strategic Plan, and an associated Integrated Resource Plan, to guide the Faculty's planning through to 2020. The Plan emerged from extensive consultations across and beyond the Faculty – with students, staff, faculty members, alumni, friends and partners. It is reflective of the new heights that York Science has reached in recent years, as well as providing a collective vision and aspiration for the Faculty's future growth. As a framework, it outlines the Faculty's aims for raising research and teaching excellence, promoting student success, and enhancing broader international impact – much of which has already been built upon since the plan's initial publication. It underscores and builds upon the Faculty's commitment to fostering scientific discovery and engaging the community, and will present as a launching point for the incoming Dean.

For more information please see:

- 2017 Faculty of Science Annual review: http://science.yorku.ca/files/2018/07/2017-Faculty-of-Science-Annual-Review.pdf

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- 2015-2020 FSc Strategic Plan and IRP: http://science.yorku.ca/about-fsc/faculty-of-science-strategic-plan-2015-2020/
- The Faculty of Science: http://science.yorku.ca/

Role and Responsibilities

Reporting to the Provost and Vice-President Academic, the Dean of the Faculty of Science is the Faculty's Chief Academic and Administrative Officer, leading its teaching, research and service missions, as well as directing the budget, general administration and future development of the Faculty. This includes administration of a Shared Accountability and Resource Planning (SHARP) budget model adopted in 2017-18, intended to better align resources in support of academic priorities and processes, give Faculties greater control over revenue and costs, and increase transparency.

As the face of Sciences at York, the Dean must be committed to the Faculty's innovative and diverse approach to education and research, and how it applies to research impact, global collaboration, and the recruitment of exceptional students, faculty and staff. They will be expected to act with integrity and dedication to the inclusive, democratic, collegial processes of the Faculty. The Dean holds ultimate responsibility of all academic matters, including the recruitment and support of outstanding undergraduate and graduate students, as well as faculty members, and the development and offering of dynamic and future-oriented programs to prepare the next generation of scientists. In addition, the Dean is a member of the senior leadership team of the wider university and helps foster an environment conducive to excellence and innovation in research and teaching, consistent with institutional priorities as articulated in the University Academic Plan and Strategic Research Plan. The Dean is also the external face of the Faculty, leading initiatives to engage with research partners and funders, industry, media, and the community more broadly, to advance the Faculty's reputation and profile.

Responsibilities of the Dean

The responsibilities of the Dean of the Faculty of Science include the following:

Leadership

- Inspire and lead innovation;
- Support equity and diversity in science, including recruitment of and support for underrepresented groups, such as women and visible minority groups;
- Provide strong, proactive and progressive leadership to the Faculty, anticipating and taking into account financial, policy and other contexts;
- Lead, through inclusive and consultative processes, in the development and achievement of priorities and plans in support of a clear and positive vision for the Faculty, consistent with institutional priorities and building on strengths;
- Foster transparency and accountability in planning and decision-making;
- Recruit, retain and engage outstanding faculty, staff, and students;
- Appreciate and promote the Faculty, including the full range of disciplines and activities it encompasses;
- Lead the further development of the sciences at York;
- Support, build on, and effectively represent the strengths of faculty, staff, and students, both individually and collectively.

Academic Administration and General Management

- Lead in strategic enrolment management, including responsibility for development of undergraduate and graduate enrolment plans (in collaboration with the Provost and other senior planners), recruitment and admissions, and retention initiatives;
- Develop hiring priorities and complement plans consistent with Faculty and institutional priorities and directions, and promote the implementation of those plans;
- Oversee financial planning and resource allocation in accordance with academic priorities, effectively managing a balanced operating budget in a challenging fiscal environment;
- Advocate on behalf of the Faculty for centrally-allocated funds and those from other sources.

Research and Scholarship

- Promote excellence and integrity in research;
- Appreciate, facilitate, support and advocate for the diverse range of research represented in faculty and student work;
- Promote and enhance the Faculty's research activity and profile;
- Explore and support initiatives to increase research funding, working with the Vice-President Research & Innovation;
- Foster opportunities for research in the Faculty to lead and contribute to understanding and addressing key "real world" issues;
- Promote the integration of research and teaching, including opportunities for undergraduate and graduate students to engage in research and discovery.

Teaching, Learning and Student Success

- Develop and implement initiatives to attract outstanding students to the Faculty and to support their transition and success;
- Lead initiatives to support undergraduate and graduate students' development as engaged and contributing citizens of their communities both local and global, and celebrate their success;
- Encourage the continuing evaluation and enhancement of academic programs in order to ensure their academic quality, their responsiveness to the evolution of the discipline(s) and student interests, and the effectiveness of their delivery to students;
- Foster innovation and outreach in support of planning for new directions in curriculum, programing, and experiential education;
- Support initiatives to foster students' progression from undergraduate to graduate study and their development as researchers;
- Working with faculty, staff, students and student organizations, implement initiatives to support student learning and the student experience, both undergraduate and graduate,

including accessibility and flexibility of program offerings and increased opportunities for funding;
- Encourage the thoughtful development and application of new learning technologies where appropriate to support student learning.

Faculty and Staff Relations
- Establish strategies to enhance the Faculty's ability to compete in the recruitment and retention of outstanding faculty and staff;
- Recognizing the differing needs, circumstances, and aspirations of staff and faculty, promote an environment of openness, engagement and equity in the Faculty, enabling staff and faculty from all backgrounds to work and study successfully;
- Foster an environment where the contributions – individual and collective – of all members of staff are recognized, respected, and valued;
- Address personnel issues in an accessible, consultative, and fair manner, adopting effective, transparent processes;
- Engage faculty and staff in representing and advocating on behalf of the Faculty;
- Encourage a sense of dynamism and collegiality in and beyond the Faculty.

Relationships Within and Outside the University
- Effectively represent and advocate on behalf of the Faculty and its members in institutional bodies;
- Represent, promote and raise the Faculty's profile within and outside of York University, including with provincial and federal governments, media and the public;
- Understand, appreciate, represent, and build upon the Faculty's strengths and distinctiveness, including strengthening and fostering inter-Faculty connections in both teaching and research;
- Seek opportunities for new and beneficial collaborations and partnerships within and beyond York, including the scientific community and industry-linked opportunities locally, nationally and internationally;
- Encourage the enhancement of international engagement across the Faculty;
- In collaboration with the Vice-President Advancement, foster network building and lead the development of new funding sources in support of research, student support and other initiatives;
- Foster ongoing engagement with the Faculty's alumni and their involvement in the Faculty.

Selection Criteria – Qualifications, Skills, and Personal Qualities

The successful candidate will bring outstanding academic qualifications and significant leadership and administrative experience, as well as exemplary interpersonal skills. The ideal candidate will present:

Experience and Qualifications

- Academic qualifications and scholarly contributions and reputation in a relevant area, consistent with expectations for a senior appointment in the Faculty;
- Demonstrated capacity for and experience in senior leadership, ideally in a large, diverse and complex institution;
- Demonstrated record of dynamic and decisive leadership, while respecting collegial and consultative approaches;
- A commitment to innovative and engaged teaching and learning practices;
- Proven ability to inspire respect;
- Experience in strategic planning and implementation to achieve goals;
- Ability to articulate a broad vision encompassing the diversity of the Faculty;
- Proven ability to provide effective administrative management, including the management of personnel, budgets, and application of University policies and procedures, towards the achievement of a complex set of strategic objectives in a dynamic environment;
- Broad and direct experience in relation to graduate and undergraduate programs and students, including openness and sensitivity to student concerns;
- Understanding of the role of provincial and federal governments and the impact of government policies on postsecondary education;
- Experience and capacity in fostering and building relationships with external communities, professional organizations, government and industry, etc.;
- Fundraising and network-building experience and the ability to maintain and expand existing relationships;
- A record as a champion of equity issues and inclusion, together with commitment to diversity and effectiveness in fostering a supportive and respectful environment for faculty, staff and students.

Skills and Personal Qualities

- Skill in engaging a range of audiences both within and beyond the institution;
- Effective listening and communication skills and the ability to foster enhanced communications across the Faculty;
- Innovative approach to problem-solving;
- Openness to hearing a range of perspectives and opinions and to seeking common ground among them;
- Ability to inspire and bring an optimistic, diplomatic, approachable, and fair style;
- Ability to work collegially with others to establish a clear sense of direction within a complex organization;
- Ability to handle rapid change and stressful situations;
- Appreciation of and ability to foster interdisciplinary and collaborative approaches;

- Skill in negotiation and mediation;
- Accessible and flexible, capable of delegating and empowering;
- Politically astute;
- Highest ethical standards.

The Appointment

The appointment is for a five-year term, commencing on July 1, 2019 or as soon as possible thereafter. Consideration of candidates will begin in November 2018 and will continue until the position is filled.

The City of Toronto

The University's location in Toronto, the cultural centre of Canada and a city of global impact, provides extensive opportunities for faculty, staff and students across the University and Faculty.

- The City of Toronto is the 4th largest city in North America and the GTA is the 48th largest urban region in the world with over 6.8 million people (2016).
- Toronto and the GTA lead Canada and North America in terms of diversity. Half of the Toronto population were born outside of Canada, half of the people living in Toronto identify as visible minority and censuses indicate over 140 languages are spoken in Toronto.
- The city's life sciences sector employs nearly 30,000 professional and contributes more than $2 billion to the local economy.
- Toronto is a hub for new ventures and entrepreneurship. It is home to 80% of Canada's largest R&D, law, advertising and high-tech firms; Canada's top accounting and mutual fund firms; and Canada's largest stock exchange.
- In North America it is the 2nd largest food production centre, the 3rd largest information technology centre, and the 3rd largest screen-based arts centre.
- Toronto is ranked 7th globally on the EIU Global Livability Survey (2018), and 16th according to the Mercer City Brands "Quality of Living" Index 2018;
- In 2015 The Economist selected Toronto as the best city to live in, and among the top 10 safest cities to live in globally.

Appointment Process & How to Apply

Perrett Laver

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York University is partnering with the executive search firm Perrett Laver on this search. For further information contact Perrett Lavers at canada@perrettlaver.com

Applications should include a CV and cover letter. Completed applications should be uploaded at www.perrettlaver.com/candidates quoting reference number **3810.**

York University is an Affirmative Action (AA) employer and strongly values diversity, including gender and sexual diversity, within its community. The Affirmative Action program, which applies to women, members of visible minorities (racialized groups), Aboriginal (Indigenous) people and persons with disabilities, can be found at http://yorku.ca/acadjobs or by calling the AA office at 416-736-5713. All qualified candidates are encouraged to apply; however Canadian citizens, permanent residents and Indigenous peoples in Canada will be given priority.

Applicants wishing to self-identify can do so by downloading, completing and submitting the forms found at: http://acadjobs.info.yorku.ca/. Please select the "Affirmative Action" tab under which forms pertaining to Citizenship and AA can be found.

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