COUNCIL OF THE FACULTY OF SCIENCE

NOTICE OF MEETING

January 12, 2021

3pm – 4:30pm

via Zoom

AGENDA

1. Call to Order and Approval of Agenda
2. Chair's Remarks
3. Approval of December 8, 2020 Minutes
4. Inquiries and Communications
   4.1 Senate Synopsis of meetings held on November 26, 2020
5. Business Arising
6. Dean's Remarks
7. Associate Deans' and Head of Bethune College Remarks
8. Reports from Science Representatives on Senate Committees
9. Student Caucus Representative Report
10. Reports from Standing Committees of Council
    10.1 Executive Committee
        10.1.1 Ratification and Call for Nominations for Senate and Standing Committee of Council
        10.1.2 Vacancies report on the Standing Committees of FSc Council (items for action)
    10.2 Curriculum Committee (consent agenda items)
11. Other Business
    11.1 Budget Consultation – Office of the President

COUNCIL OF THE FACULTY OF SCIENCE

MINUTES

December 8, 2020

3pm – 4:30pm

via Zoom

---

1. **Call to Order and Approval of Agenda**
   The Chair of Council, C. Storry, called the meeting to order and the Agenda was adopted.
2. **Chair's Remarks**
   The Chair of Council, C. Storry welcomed members.
3. **Approval of November 10, 2020 Minutes**
   A motion was moved, seconded and carried to approve the Minutes.
4. **Inquiries and Communications**
   4.1 Senate Synopsis of meetings held on November 26, 2020
5. **Business Arising**
   There was none.
6. **Dean's Remarks**
   Dean Wang thanked everyone for all of their hard work this semester and wished Council members a happy holiday and new year. He reported that the 2020-2025 Strategic Planning Advisory Board will seek feedback and input from faculty, staff, alumni and students via survey and townhall meeting in the upcoming weeks. He added that the Internal Strategic Planning Advisory Board has 3 vacancies to be urgently filled: 2 CUPE-2 contract faculty and 1 post-doc fellow.

   Dean Wang advised Council that the Strategic Mandate Agreement between the Ministry of Colleges and Universities and York University has been finalized and can be found online: https://vpap.info.yorku.ca/reports/

   Dean Wang updated Council that Summer 2021 courses will be mostly delivered online; Faculty members must submit the In-Person Teaching Request form for approval to teach on campus. He added that discussion surrounding how Fall/Winter 2021 courses will be delivered are still in progress.

   The Dean's Special Space Strategic Taskforce met and considered all the feedback and suggestions that were submitted. They will finalize the White Paper and release it to Faculty in the upcoming weeks.

   Dean Wang explained that the Faculty Complement plan is continuous and moving; 3 additional academic positions were approved, 2 in Biology and 1 in Mathematics & Statistics.

   Congratulations:
   Professor Eric Hessels received the 2020 Canadian Association of Physicists (CAP) Medal for Lifetime Achievement in Physics.

Sergey Krylov and Professor James Elder from Lassonde have been awarded $500,000 ($250,000 each) in funding for their cutting-edge COVID19 related research projects.

Highlight:
Two $25,000 scholarships for undergraduate and graduate mathematics students have been founded in memory of Dr. Sara Maghdoori, by her family. Sara Maghdoori was a Graduate Research Associate and Teaching Assistant in the Faculty of Science's Department of Mathematics and Statistics.

Faculty of Science in media:
Profs. Dasantila Golemi-Kotra, Jane Heffernan and Jianhong Wu have each received a wide media coverage discussing and offering commentary on COVID19.

Profs. Elaina Hyde and Paul Delaney were each featured in a number of media outlets discussing the Mars opposition and commenting on a number of astronomical events.

Dean Wang reminded Council of the Faculty of Science Holiday reception on December 17 at 330pm and the Carswell event on December 21 at 4pm – 6pm.

7. Associate Deans' and Head of Bethune College Remarks

Associate Dean, Faculty, Gerald Audette updated Council that the 4 Faculty of Science academic searches are still on-going and the Bethune Head search will be running soon. Council was reminded to submit CVs and any outstanding sabbatical reports.

On behalf of Associate Dean, Students, Mike Scheid, Gerald reported the following:
The Summer 2021 in-person teaching requests deadline has been extended until December 14.
Call for Experiential Education feedback was sent to Faculty.
Special deferred exam period for FW2019/20 is January 17 & 24.

On behalf of Associate Dean, Research & Graduate Education, Jennifer Steeves, Gerald reminded Council that there is no access to campus over the holidays. Any urgent access requests must be submitted via the Machform.

8. Reports from Science Representatives on Senate Committees

There were none.

9. Reports from Standing Committees of Council

9.1 Executive Committee

9.1.1 Ratification and Call for Nominations for Senate and Standing Committee of Council

A motion was moved, seconded and carried to ratify all nominations as presented.

9.1.2 Vacancies report on the Standing Committees of FSc Council (items for action)

The Chair of Council of Council, C. Storry, noted the vacancies and encouraged Faculty to nominate colleagues.

9.2 Curriculum Committee (consent agenda items)

A motion was moved, seconded and carried to approve all items.

10. Other Business

10.1 Inclusion of Student Caucus Representative Report

A motion was moved, seconded and carried to include a Student Caucus Reprehensive Report to the Faculty Council agenda.

10.2 Student workload and mental health

Student Counselling, Health & Well-being staff were introduced and students were given the opportunity to discuss their workload and mental health concerns this past semester since COVID19 and learning online. Anxiety, financial burdens, isolation, struggles to keep up with courses and how courses are delivered by Professors were concerns. Students were reassured by the Student Counselling, Health & Well-being staff that they are there to support them and additional resources can be found online: https://mhw.info.yorku.ca/resources/resources-at-york/students/.

ATTENDANCE
Tianna McFarlane
Maggie Xu
Daniel Kamel (Student) (Daniel Kamel)
Jessica Sinha (student) (Jessica Sinha)
Hamed Babazadeh (Student) (Hamed Babazadeh)
Elaina Hyde
Jerusha Lederman
Ali Bashar (Student) (Ali Bashar)
Alice Fours (Alice Fours)
Elaheh Abdollahi
Stephen Watson
Ailiya Rizwan (student) (Elana Dhaigham)
Vera Pavri
Sameen Ali
Julyana Al-Hussain (student) (Julyana Al-Hussain)
Sormeh Mehrabi
Anita Khoshnik
Hila Akbari
Hassan Khan
Melissa Hughes
Patricia Lakin-Thomas
Rene Fournier
Jill Lazenby
Rui Wang
Carl Wolfe
Molly Hu (Student Member) (Molly Hu)
Thomas Baumgartner
Areeba Chaudhry (Student) (Areeba Chaudhry)
Daniela Monaldi
Olga Andriyevska
Neal Madras

Gemner Sandoval (student) (Gemner Sandoval)
John Amanatides
Wendy Taylor
Huaiping Zhu
Iain Moyles
Robin Metcalfe
Brad Sheeller (non-member/guest)
Jonathan Cevallos
Almira Mun
Mark Bayfield
Jennifer Steeves
Cody H Storry
Hovig Kouyoumdjian
Maksym Stolyarevskyy (Staff)
Robert Tsushima
Julie Clark
Helen McLellan (Staff Member)
Sibonile Siyakatshana
amenda chow
Stephanie Domenikos (STS)
Tom Salisbury
Paul Mayol
Malisa Phaviseth (Malisa Phaviseth)
Stephen Childs

The Senate of York University

Synopsis

The 671st Meeting of Senate held on Thursday, November 26, 2020 via Zoom

Remarks

The Chair of Senate, Professor Alison Macpherson of the Faculty of Health, welcomed Senators to the meeting and extended appreciation for their continued participation in collegial governance processes while balancing other activities and duties during the University's remote operations. Acknowledging the landmark decision made by Senate in October to change the University's grading scheme and progression standards, the Chair applauded the Senate Academic Standards, Curriculum and Pedagogy Committee (ASCP) and its current and former Chairs, Senators Chloë Brushwood Rose and Kim Michasiw, respectively, for shepherding efforts associated with the initiative.

In the context of the second wave of the COVID-19 pandemic and enhanced restrictions in the City of Toronto, President Rhonda Lenton's remarks included the following:

- gratitude to members of the University community for their efforts to maintain University operations during these uncertain times
- the importance of working together collectively to simultaneously respond to the pandemic and look ahead to post-pandemic recovery
- an update on the University's enrolment picture which is generally positive thanks in part to strengthened Strategic Enrolment Management efforts in recent years, with overall Fall 2020 enrolment numbers anticipated to exceed pre-pandemic targets despite declines in intake among domestic students at the undergraduate and graduate levels and international students
- results of a recent survey about the student experience in the remote delivery context, which suggest some uncertainty in terms of student retention going forward
- the timeliness of reflecting on who York's students are and what new emerging programming the University might offer in view of the anticipated increase in demand for upskilling and training as a result of the pandemic and advances in artificial intelligence and automation and the provincial government investment of $59.5M to support Ontario's micro-credential strategy
- the impacts of the pandemic on research and innovation productivity

The Senate of York University

Synopsis

- best wishes for the holiday season

The monthly “Kudos” report on the achievements of members of the York community can be accessed with other documentation for the meeting.

Reports

Academic Colleague to the Council of Ontario Universities (COU)

Speaking to the written report included in the agenda, the Academic Colleague to COU, Senator Brenda Spotton Visano, reported on the October COU meetings in which new COU President and CEO Steve Orsini conveyed COU’s three key priorities and a number of updates were provided on policy matters and initiatives under discussion at the provincial level.

Facilitated Discussion

Under the auspices of the Executive Committee, a facilitated discussion was held on planning for the delivery of academic programs in the Fall/Winter 2021-2022 academic year, with Senators invited to share comments and observations on the following question:

> As in-person teaching and learning gradually return to York’s campuses, what pedagogical or curricular insights should be retained from the experiences of the pandemic, and how will these experiences shape the way that students learn, as well as the way that academic programs are designed and delivered in future?

A wide-ranging discussion ensued in which a number of themes surfaced, including the challenges and opportunities encountered by students and faculty members in the remote course delivery environment, the timeliness of considering the development of a pan-University understanding of online learning and the clarification of Quality Assurance parameters around changes to the mode of program delivery post-pandemic, and the importance of grounding all program planning decisions in supporting the achievement of program learning outcomes.

Senators’ input was gratefully received and, along with feedback from Faculty Councils, will inform local and pan-University planning and decision-making as appropriate for the 2021-2022 academic year.

The Senate of York University

Synopsis

Approvals

Senate approved the recommendation of its Academic Policy, Planning and Research Committee to change the name and mandate of the Institute for Research on Digital Learning, to be called the Institute for Research on Digital Literacies going forward.

On the recommendation of its Academic Standards, Curriculum and Pedagogy Committee, Senate approved a minor revision to the *Policy on York University Grading Schemes*.

Committee Information Reports

Executive (Professor Mario Roy, Vice-Chair)

The Executive Committee's information items included the following:

- its ongoing monitoring of the impact of the COVID-19 pandemic on academic activities, with actions pertaining to the disruption outlined in its written Report
- its approval of members of Senate committees nominated by student Senators
- its review of the Faculty Council rules and procedures of the Osgoode Hall Law School and the School of the Arts, Media, Performance & Design
- additions to the pool of prospective honorary degree recipients and the decision supported by the Sub-Committee on Honorary Degrees and Ceremonials for the University to issue digital copies of diplomas to graduates so they can have timely confirmation of their credential
- an update on its membership for 2020-2021
- the anticipated cancellation of the December Senate meeting

Academic Policy, Planning and Research (Professor Brenda Spotton Visano, Chair)

APPRC reported on the following items:

- Committee input to the President, Provost and Vice-President Finance and Administration on the university budget consultation
- the initiation of preliminary discussions about academic governance structures and processes for Markham Centre Campus

The Senate of York University

Synopsis

- its receipt of a Report from the Organized Research Units (ORU) Sub-Committee and a briefing from from the Vice-President Research and Innovation on the report on the internal audit of ORUs
- the plans for the VPRI to deliver his Annual Report in February once external data has been obtained and analyzed
- its discussion with the Provost on the Faculty Complement Renewal Strategy
- its concurrence with a proposal from the Provost to establish the Helen Carswell Chair in Dementia Care, which will proceed to the Board for review
- an update on its membership for 2020-2021

ASCP (Professor Chloë Brushwood Rose, Chair)

ASCP's information items included an update on recent implementation activities associated with the transition to the new grading schemes and the following minor changes approved by the Committee.

Faculty of Education
Discontinuation of the stop-out pathway for the Bachelor of Education program

Faculty of Graduate Studies
Changes to admission requirements for the Master of Business Analytics program, Schulich School of Business
Changes to admission requirements for the Master of Management in Artificial Intelligence program, Schulich School of Business
Changes to Graduate Studies Regulations on Academic Honesty, Balance of Degree Fees and Registration

Additional Information about this Meeting

Please refer to the full Senate agenda and supplementary material posted online with the Thursday, November 26, 2020 meeting for details about these items.

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

January Meeting of Senate

Senate's next meeting will be held at 3:00 pm on Thursday, January 28, 2021.

2020-2021 FSc Report on vacancies for Senate and FSc Standing Committees of Council

January 7, 2020

Ratification of Nominations

Petitions Committee
K. Belozerov

2020-2021 FSc Report on vacancies for Senate and FSc Standing Committees

Committee	Rules of Faculty Council - membership	Meeting time / Membership	Term		
			From	To	
Senate	According to the York University Secretariat based on the Senate Rules and Procedures governing the size and composition of Senate, the Faculty of Science shall have twelve members, including a minimum of two Chairs. According to The Rules of Council (Science), Faculty representation shall include the Director of Natural Science, three Department Chairs, and terms shall be for three years.	As per Senate website			
	Dean, Ex officio	R. Wang	Designated		
	Member at large	G. Audette	Designated		
	Member at large	E. Hessels, Physics & Astronomy	2019	2022	
	Member at large	C. Douglas (1yr replacement)	2019	2022	J. Lazenby on Sabbatical July 2020-June 2021
	Member at large	T. Baumgartner, Chemistry	2018	2021	
	Member at large	B. Pietro, Chemistry	2019	2022	
	Member at large	M. H. Armour - 1 yr replacement	2019	2022	P. Lakin-Thomas, Biology on sabbatical, return to Senate July 1, 2021
	Member at large	N. Madras - 1 yr replacement	2020	2023	D. Wilson on Sab. Starting May 2020 - April 30-2021
	Department Chair	R. Tsushima, Biology	2018	2021	
	Department Chair	R. Fournier, Chemistry	2019	2022	
	Department Chair	S. Watson, Mathematics & Statistics	2019	2022	
	Director of NATS	J. Clark	Designated		
	Student representative	Julyana Al-Hussain	2020	2022	
	Student representative	Romina Noormohammadi	2019	2021	
FSc Reps on Senate Committees					
Senate Executive	1 member from FSc	M. H. Armour	2018	2021	M.H. Armour to serve 1 year, 2020-2021
Academic Policy, Planning and Research Committee (APPRC)	1 member from FSc	D. Golemi-Kotra	2020	2023	
Sub-Committee on Honorary Degrees & Ceremonials	1 member from FSc	M. N. Yousaf	2020	2023	
Executive Committee	The Executive Committee shall be chaired by the Chair of Council and include the Vice-Chair of Council, the Secretary of Council, and one member elected from each of Biology, Chemistry, Mathematics & Statistics, Physics & Astronomy, and Science and Technology Studies/Natural Science, the Dean of the Faculty of Science (ex officio), one student member of Council, and one of the staff members elected to Council.	The Executive Committee will normally meet the first Tuesday of each month (September to May) from 3:00pm - 4:30pm in LUM 305B			
	Chair of Council	C. Storry	2020	2021	
	Vice-Chair of Council	T. Salisbury	2020	2021	
	Dean, Ex officio	R. Wang	Designated		
	Asst. Dean - SEM & SEP	A. Mun	Designated		
	Staff representative	V. Gotcheva	2020	2021	
	Undergraduate Student Rep	Hila Akbari	2020	2021	
	Biology	D. Golemi-Kotra	2020	2023	
	Chemistry	S. Krylov	2019	2022	
	Math & Stats	N. Madras	2019	2022	
	Physics & Astronomy	S. Menary	2020	2021	
	STS	V. Pavri	2020	2023	
APPC	The Academic Policy and Planning Committee shall include the Dean or designate (ex officio), the Master of Norman Bethune College and one member elected from each of Biology, Chemistry, Mathematics & Statistics, Physics & Astronomy, and Science and Technology Studies/Natural Science, one student member of Council, and one of the staff members elected to Council.	APPC will normally meet the last Thursday of each month (September to April) from 9:00 am - 10:30 am			
	Associate Dean, Faculty Affairs, Ex officio	G. Audette	Designated		
	Head of Bethune College	J. Amanatides	Designated		
	Undergraduate Student Rep	Rachel Duncan	2020	2022	
	Elected staff representative	M. Xu	2020	2021	
	Biology, also representing STS	J. Clark	2019	2022	
	Chemistry	R. McLaren	2019	2022	
	Math & Stats	Man Wah Wong - 1 year replacement ie, 2020-2021	2019	2022	J. Heffernan on Sabbatical Jul 1, 2020 - Jun 2021
	Physics & Astronomy	E. Hessels	2020	2021	
	STS	Represented by J. Clark	2019	2022	
Curriculum Committee	The Curriculum Committee shall include the Dean and an Associate Dean (ex officio), the Chair or nominee from each teaching Division or Department, three members elected by Council and two student members of Council.	The Curriculum Committee will normally meet every last Tuesday of each month (September to April) from 1:30 pm - 3:00 pm			
	Member at Large	J. Clark	2019	2022	
	Member at Large	B. Schwarz	2020	2023	
	Dean, Ex officio	R. Wang	Designated		
	Associate Dean - Students, Ex officio	M. Scheid	Designated		
	Undergraduate Student Rep	Elana Dhaigham	2020	2021	
	Undergraduate Student Rep	Jessica Sinha	2020	2021	
	Biology	S. Connor	2019	2022	
	Chemistry	P. Potvin	2019	2022	
	Math & Stats	J. Grigull (Winter) VACANT (Fall)	2019	2022	
	Physics & Astronomy	S. Jerzak	2020	2021	
	STS	S. Domenikos	2020	2021	
	Member at Large	C. Rozins	2020	2023	

2020-2021 FSc Report on vacancies for Senate and FSc Standing Committees

Committee	Rules of Faculty Council - membership	Meeting time / Membership	Term		
			From	To	
CEAS	The Committee on Examinations and Academic Standards shall consist of an Associate Dean (ex officio), five members elected by Council from each of Biology, Chemistry, Mathematics & Statistics, Physics & Astronomy and Science and Technology Studies/Natural Science, and one student member of Council.	CEAS will normally meet every alternate Wed / Thurs from 1:00 - 3:00 pm year round.			
	In addition to the above membership of the committee, Council shall elect an alternate member from each of the Departments specified above. The alternate member shall be the person polling the next highest number of votes to those elected to the committee from each Department. The alternate for the student member will be selected by the Science Student Caucus from one of its Members at Large. An alternate can only vote in the event that first elected members are not in attendance.				
	Associate Dean - Students, Ex officio	M. Scheid	Designated		
	Undergraduate Student Rep	Ali Bashar	2020	2021	
	Undergraduate Student Rep	Sormeh Hamedani	2020	2021	
	Biology	C. Jang/ALT B. Schwartz & S. Connor	2019	2022	S. Connor to serve 1 year
	Chemistry	H. Kouyoumdjian / R. McLaren / T.Mirkovic	2020/2018	2023/2021	T. Mirkovic to serve 1 year
	Math & Stats	M.Chen (Fall) Y. Wu (Winter) ALT C. Fu	2020/2019	2023/2022	M. Chen-Sabbatical Jan 2021-Jun 2021
	Physics & Astronomy	M. Horbatsch; P. Delaney (Sept - Nov), William van Wijngaarden (Dec - Feb), Saeed Rastgoo (Mar - May)	2020	2021	J. Lazenby on Sabbatical July 2020-June 2021
	STS	J. Elwick/J. Rogerson	2020/2023	2020/2023	
Petitions	The Petitions Committee for the purpose of hearing student petitions shall consist of an Associate Dean (ex officio), six members of Council, and two student members of Council. The Committee may divide the workload by splitting the Committee membership into two panels of four people each. A quorum shall consist of either (a) two faculty voting faculty members and one student member or (b) three voting faculty members.	Each panel meets once a month on Wednesday or Thursday from 2:30 pm - 4:00 pm			
	Associate Dean, Ex officio	M. Scheid	Designated		
	Undergraduate Student Rep	Yashna Manek	2020	2021	
	Undergraduate Student Rep	Hassan Khan	2020	2021	
	Member at Large	K. Belozerov	2020	2023	
	Biology	A. Mills	2020	2022	
	Chemistry	W. J. Pietro	2019	2022	
	Physics & Astronomy	N. Bartel (member in Fall ALT in Winter)/N. Bozorgnia ALT in Fall & member in Winter)	2020	2021	
	Math & Stats	Y. Gao	2019	2022	
	STS	S. Domenikos	2020	2021	
	Member at Large	VACANT	2020	2023	
SRC T & P Committee	The Committee on Tenure and Promotions shall consist of one currently tenured member from each of Biology, Chemistry, Mathematics & Statistics, Physics & Astronomy and Science and Technology Studies/Natural Science elected by Council, and one student member of Council. No member of the Committee shall be a member of another Tenure and Promotions Committee at any time during their tenure on this committee.	SRC T & P Committee will normally meet the last Friday of each month (September to May) from 9:00 am - 11:00 am in LUM 305B			
	In addition to the above membership of the committee, Council shall elect an alternate member from each of the Units mandated above. The alternate member shall be the person polling the next highest number of votes to those elected to the committee from each Department. The alternate for the student member shall be selected by the Science Student Caucus from one of its Members-at-Large on an annual basis. An alternate can only vote in the event that existing members are not in attendance.				
	Associate Dean - Faculty, Ex officio	G. Audette	Designated		
	Undergraduate Student Rep	Daniel Kamel	2020	2021	
	Graduate Student Rep	Si Jia (Molly) Hu	2020	2021	
	Biology	K. Hudak / ATL Jean-Paul Paluzzi	2020/2020	2023/2023	
	Chemistry	D. Ifa/ALT. V. Tsoukanova	2020/2019	2023/2022	Liang on Sab. Jan. 1, 2021-June 2021
	Physics & Astronomy	W.Taylor/ALT.D. Harris	2020	2021	
	Math & Stats	A. Wong (Winter) S. Wang (Fall) ALT Y. Gao	2019	2022	
	STS	D. Lungu/ALT Vacancy	2018	2021	
CoTL	Currently, the Committee on Teaching and Learning shall consist of a minimum of two Faculty members from each department, the Associate Dean – Students, one Librarian, one staff member, one undergraduate student, and two graduate students, in addition to other members invited as provided for by the Rules. Graduate students and staff nominees will indicate their interest in serving on the committee in writing to the committee, who will then approve by majority vote.	CoTL normally meets every third Thursday of each month (September to May) from 10:00 am - 11:30 am			
	Associate Dean - Students, Ex officio	M. Scheid	Designated		
	Graduate Student Representative	Gabriella Gerzon	2020	2021	
	Graduate Student Representative	VACANT	2020	2021	
	Undergraduate Student Rep	Areeba Chaudhry	2020	2021	
	Steacie Librarian	Illo-Katryn Maimets	Designated		
	IT Representative	V. Gotcheva	Designated		
	Teaching Commons Rep	Y. Su	Designated		
	Staff representative, Elected	D. Hossain	2020	2021	
	Biology	D. Golemi-Kotra	2020	2023	
	Biology	C. Jang	2020	2023	
	Chemistry	T. Mirkovic	2020	2023	
	Chemistry	C. Caputo	2018	2021	
	Physics & Astronomy	C. David	2020	2021	
	Physics & Astronomy	E. Hyde	2020	2021	
	Math & Stats	G. Monette	2020	2023	
	Math & Stats	I. Poliakov (6 month replacement - Jul - Dec 2020)	2018	2021	W. Liu on Sabbatical - July 2020- Dec 2020
	STS	R. Marushia	2019	2022	
Committee on Research & Awards	The Committee on Research and Awards shall consist of one member elected by Council from each of Biology, Chemistry, Mathematics and Statistics, Science and Technology Studies/Natural Science, and Physics and Astronomy, one student member of Council and an Associate Dean (ex officio) who will serve as the Chair.	The Research & Awards Committee will meet when grants and awards need to be adjudicated.			
	Associate Dean - Research & Graduate Education, ex officio	J. Steeves	Designated		
	Undergraduate Student Rep	Sameen Ali	2020	2021	
	Biology	R. Kwong	2020	2023	
	Chemistry	M. Yousaf (1 year replacement)	2019	2022	S. Morin on Sab. Starting July 1, 2020-2021
	Physics & Astronomy	A. Kumarakrishnan	2020	2021	
	Math & Stats	Huaiping Zhu	2019	2022	
	STS	H. Mialet	2020	2023	
Appeals Committee	The Appeal Committee for the purpose of hearing student appeals shall consist of four elected faculty members from Science units, an Associate Dean (ex officio) and two student members of Council. A quorum shall consist of either (a) two faculty members and one student member or (b) three faculty members.	Meeting is held once a month and times are polled by the Committee Secretary.			
	Associate Dean - Faculty, ex officio	G. Audette	Designated		
	Undergraduate Student Rep	Yurij Kunyckyj	2020	2021	
	Undergraduate Student Rep	Tanya Rajwani	2020	2021	
	Member at Large	R. Fournier	2019	2022	
	Biology	N. Kovinich	2020	2023	
	Chemistry	M. Hempstead	2020	2023	
	Physics & Astronomy	S. Rastgoo	2020	2021	
	Math & Stats	A. Wong	2020	2023	
	STS	M.H. Armour	2018	2021	

2020-2021 FSc Report on vacancies for Senate and FSc Standing Committees

Committee	Rules of Faculty Council - membership	Meeting time / Membership	Term	
			From	To
Graduate Education Program	To provide broad review and commendation to Council via the Academic Policy and Planning Committee of all proposals received from Graduate Programs with respect to: New Course Proposals , Course Change Proposals, Minor Changes to Program/Graduate Diploma Academic Requirements, Major Modifications to Program/Graduate Diploma Academic Requirements, New Graduate Fields, New Graduate Diplomas, New Graduate Degree Programs The Graduate Education Committee shall consist of: - Associate Dean – Research & Graduate Education (ex officio) - Graduate Program Director (or designate who must be a member of the graduate program) of each Graduate Program in the Faculty of Science -one graduate student member from any Graduate Program within the Faculty of Science -one full-time faculty member from the Faculty of Health or Lassonde School of Engineering who is appointed to teach in any FSc graduate program - A member at large with knowledge of graduate programming, and experience with curriculum approvals at the Faculty-level. The Chair of the Committee is selected by the voting members of the Committee for a one-year term.	Meeting is held		
	Associate Dean – Research & Graduate Education (ex officio)	J. Steeves	Designated	
	Biology	B. Stutchbury	2020	2023
	Chemistry	R. McLaren	2020	2022
	Physics & Astronomy	M. Johnson	2020	2023
	Math & Stats	S. Moghadas	2020	2023
	STS	K. Birch	2020	2021
	Member from Faculty of Health OR Lassonde	VACANT		
	Member at Large	VACANT		
	Graduate student	Ellie Abdollahi	2020	2021
EDI	The purpose of the Committee on Equity, Diversity & Inclusivity is to provide broad review and leadership to Council on matters of Equity, Diversity and Inclusivity issues with respect to: • Tenure and Promotions • Hiring and Retention of members form EDI groups • Approaches to addressing gender bias in the workplace • Research engaging equity recognized groups • Workload and service contributions of EDI members • EDI experiences in Teaching and Learning The Equity, Diversity and Inclusivity committee shall consist of: • Associate Dean, Faculty Affairs (ex officio) • Associate Dean, Research & Graduate Education (ex officio) • One primary and one alternate member from each of Biology, Chemistry, Mathematics & Statistics, Physics & Astronomy and Science & Technology Studies. • Two graduate students or postdoctoral fellow/visitors (one primary and one alternate) from any graduate program within the Faculty of Science • One undergraduate student	Meeting is held TBD		
	Associate Dean - Faculty, ex officio	G. Audette	Designated	
	Associate Dean, Research & Graduate Education (ex officio)	J. Steeves	2020	2023
	Undergraduate Student Rep	Ailiya Rizwan	2020	2022
	Graduate Student / Post Doc Reprsentative	Olga Andriyevska	2020	2022
	Graduate Student / Post Doc Reprsentative	Hamed Babazadeh	2020	2022
	Biology	VACANT	2020	2023
	Chemistry	C. Le	2020	2023
	Physics & Astronomy	D. Harris	2020	2023
	Math & Stats	A. Chow	2020	2023
	STS	V. Pavri	2020	2023

Curriculum Committee Report

December 2020

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 December 15, 2020, 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

1.2 BIOL

1.2.1 Change in cross listing: SC/BIOL 4245 3.0 and EU/ENVS 4110 3.0 “Conservation Biology”

1.3 NEUROSCIENCE

1.3.1 Change in prerequisites: SC/BIOL 4310 3.0 “Physiology of Circadian Timing”, SC/BIOL 4370 3.0 “Neurobiology” and SC/BIOL 4380 3.0 “Systems Neuroscience”

1.4 ENVIRONMENTAL SCIENCE PROGRAM

1.4.1 Major Modification change to existing program: Environmental and Urban Change / Science (Dept. of Biology)

Changes to Existing Course

Faculty:

Department: Biology

Date of Submission: Nov. 13, 2020

Course Number: 4245 3.0

Effective Session: FW 2021

Course Title: Consevation Biology

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):
- [x] 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:**
Cross-listed to: SC/ENVB 4245 3.00 Explores the role of biological science in efforts to conserve natural resources, systems and the organisms therein. Prerequisites: SC/BIOL 2050 4.00, SC/BIOL 2060 3.00.	Cross-listed to: SC/ENVB 4245 3.0; **EU/ENVS 4110 3.00** Explores the role of biological science in efforts to conserve natural resources, systems and the organisms therein. Prerequisites: SC/BIOL 2050 4.00, SC/BIOL 2060 3.00.

Rationale:

April 2013 Science curriculum committee/May 2013 Science Faculty Council approved course change to BIOL 4245 to prerequisites. Change was entered into COS but cross-listing to ENVS 4110 3.0 was mistakenly omitted.

Below is a copy of the course description prior to the cross-listing being removed:

> This course explores the role of biological science in efforts to conserve natural resources, systems and the organisms therein. Two lecture hours, three laboratory hours. One term. Three credits. Prerequisites: SC/BIOL 2010 4.00; one of SC/BIOL 2030 4.00, SC/BIOL 2031 3.00; SC/BIOL 2040 4.00; SC/BIOL 2050 4.00; or permission of the instructor.

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.

To establish York's new undergraduate neuroscience program, which started this year, seven new courses were created. Three of these new courses (NRSC 2000, 2100 and 3000, described below) provide basic, fundamental knowledge across the field of neuroscience which ranges from molecular neuroscience, to system, behavioural and cognitive neuroscience. The subject matter and learning objectives of these three required NRSC courses were designed to be suitable prerequisite substitutes for upper level "neuroscience-related" courses already existing in Biology, Kinesiology & Health Science, and Psychology. We are proposing a number of course requirement changes in order to officially include NRSC 2000, 2100 or 3000 as alternative prerequisites to the existing prerequisites listed for **eleven** upper year courses.

Rationale:
Of the 64 credits required by neuroscience majors, 24 credits will be chosen from existing streams comprised of upper year courses offered in Biology, Kinesiology & Health Science, and Psychology. These "streams" have a specific foci: (1) Molecular & Cellular Neuroscience, (2) Systems Neuroscience, and (3) Behavioural and Cognitive Neuroscience. All neuroscience majors, no matter which School/department pathway they enter from (Biology, Kinesiology & Health Science, and Psychology) must take 3-12 credits from each stream.

Given that neuroscience majors are required to complete 64 credits in their major, it would not be feasible for these students to further fit in all the prerequisites for these upper year courses from the three participating departments. It is also not pedagogically necessary to require neuroscience majors to take the existing prerequisite courses. We are proposing that the new courses, NRSC 2000, 2100 and 3000 would provide a very relevant background and foundational knowledge on the subject-matter covered by the upper year course.

Another change requested concerns which statistics course they take. Within the neuroscience program proposal, we said that students have a choice of which statistics course they take depending on their Neuroscience pathway in Biology, Kinesiology & Health Science, or Psychology as their home (entry) departments/school. In some cases, there are required pre-existing upper year courses listing statistics as a prerequisite. Here, we also propose that the prerequisite statistics courses listed should also include statistic courses from not only the home program but from the other two departments/school.

The proposed changes are summarized in Table 1 which includes course descriptions and learning outcomes of the NRSC courses. Table 2 describes the "Change from" and "change to" calendar copy details along with the rationale for each of the prerequisite changes for the 11 upper year PSYC, BIOL, KINE courses.

Table 1: Summary of NRSC courses, descriptions, learning outcomes, and proposed courses for which the NRSC courses can serve as a prerequisite.

NRSC Courses	Course description	Course expected learning outcomes	Serve as a prerequisite for the following courses:
NRSC 2000 3.00 *Fundamental Molecular and Cellular Neuroscience*	Survey of the key areas of neuroscience including a historic perspective, gross anatomy and histology of the nervous system, development of the nervous system, molecular and cellular neuroscience, and neurological disorders.	• Distinguish the different cell types present in the peripheral and central nervous system and outline the mechanisms by which the central and peripheral nervous systems form. • Describe the many properties of ion channels and how they contribute to the resting membrane potential and the propagation of the action potential. • Distinguish the different types of cell surface receptor for neurotransmitters and hormones and distinguish between voltage- and ligand-gated ion channels. • Explain the mechanisms by which nervous impulses are conducted along the axons of myelinated and unmyelinated axons. • Explain the basic molecular mechanisms underlying chemical transmission in the nervous system. • Describe how action potentials and voltage-sensitive calcium channels regulate neurotransmission. • Describe the basic mechanism by which neurons communicate, e.g. synaptic transmission and electrical coupling. • Describe how synaptic information is integrated and the synaptic basis of LTP and LTD. • Describe how ion channels and cell surface receptors contribute to cell function in physiological systems, e.g. the retina and auditory systems.	KINE 3670 Molecular and Cellular Neuroscience with applications to Health BIOL 4310 3.00 Physiology of Circadian Timing BIOL 4370 3.00 Neurobiology KINE 4230 3.00 Neuronal Development for Activity and Health KINE 4505 3.00 Neurophysiology of Movement in Health and Disease

		• Describe how drug development can be used to elucidate the nature of the molecular targets used in the treatment of specific CNS disorders. • Relate basic neuroscience concepts to animal and human psychology and behaviour. • Explain the mechanisms of action of drugs of abuse and the use of drugs to treat neurological and psychiatric disorders. • Determine and analyze the accuracy and relevance of information presented in online and/or in print media presenting on new drug development to address a brain disorder (e.g., dementia, addiction). • Describe the purpose and process of at least two research methodologies used in neuroscience (e.g., electrophysiological, brain imaging) • Discuss their approach to and process for analyzing research articles based on information presented in class.	
NRSC 2100 3.00 *Systems, Behavioural, and Cognitive Neuroscience*	Explores the structure and function of the human brain. Topics include the organization of the central nervous system, the function and neural basis of sensory and movement systems, consciousness, language, thought and memory.	• Describe the structural organization of the human central nervous system • Describe the brain's major components, lobes of the cerebral cortex, and the gross functional organization, including the areas responsible for sensory systems and motor output • Identify the various techniques by which we can measure brain function • Describe how the techniques used to measure brain function capture information about how the brain works • Describe the sensory systems, including the coding of information at the sensory	PSYC 3250 Neural Basis of Behaviour BIOL 4380 3.00 Systems Neuroscience KINE 4225 3.00 Principles of Neuro-motor Learning KINE 4500 3.00 Neural Control of Movement

		receptors, through the processing of this information in the cortex • Describe the motor system, from the areas in the brain responsible for planning movements, the contributions of the cerebellum, through the actions of motor units • Explain the functions/structure of the brain that control eye and head movements and their relationship to the vestibular system • Explain what is meant by consciousness • Describe which functions of the brain are conscious or unconscious • Describe language and how it differs from other animal communication systems • Identify the parts of the brain responsible for producing and comprehending language • Describe memory systems in the brain • Differentiate between declarative and procedural memories.	
NRSC 3000 3.00 *Molecular and Cellular Neurobiology*	Explores the molecular, structural and cellular basis of complex brain functions focussing on perception, learning and memory	• Describe the structural, molecular and cellular components of the nervous system relevant to perceive and process sensory information. • Describe the structural, molecular and cellular components of the nervous system relevant for learning and memory. • Describe fundamental processes that generate, shape and maintain sensory organs in the developing and aging brain. • Explain the molecular and cellular basis of fundamental processes in signal transduction (e.g.	KINE 3670 Molecular and Cellular Neuroscience with applications to Health BIOL 4310 3.00 Physiology of Circadian Timing BIOL 4370 3.00 Neurobiology KINE 4230 3.00 Neuronal Development for Activity and Health

		Membranes and Membrane Potentials, The Action Potential, Voltage-dependent Membrane Permeability) with a focus on sensory organs, learning and memory. • Explain the functions of Ion Channels, Electrical and Chemical Synapses • Explain the functions of Signal Transduction Pathways. • Describe pathological mechanisms of inherited sensory deficiencies like deafness or forms of blindness from a molecular and cellular perspective. • Describe pathological mechanisms of learning and memory deficiencies • Critique published decisions about- or arguments related to- real-world topics related to the nervous system with a focus on sensory processing, learning and memory. • Compare the use of several state-of-the-art technologies to investigate the Sensory Systems in Health and Disease. • Compare in vitro and in vivo strategies to investigate sensory systems from molecules to structures and cells.	

Table 2: Summary of the 11 courses with prerequisites indicated (Change from column) and what we are proposing to add to the list of prerequisites (Change To column), along with a succinct rationale for those changes.

Course	Change from	Change to	Rational
PSYC 3250 **Neural Basis of Behaviour**	Prerequisite: HH/SC/PSYC 1010 6.00, with a minimum grade of C; HH/SC/PSYC 2240 3.00 *(Biological Basis of Behaviour)* or HH/PSYC 3145 3.00.	Prerequisite: HH/SC/PSYC 1010 6.00, with a minimum grade of C; HH/SC/PSYC 2240 3.00 or HH/PSYC 3145 3.00 **or HH/SC NRSC 2100 3.0**	NRSC 2100 (Systems, Behavioural and Cognitive Neuroscience), will be one of the core required courses for the Neuroscience program. The course content will provide the necessary background for PSYC 3250.
KINE 3670 **Molecular and Cellular Neuroscience with Applications to Health**	Prerequisite: HH/KINE 3012 3.00 *(Human Physiology II)*	Prerequisite: HH/KINE 3012 3.00 *(Human Physiology II)* **or HH/SC NRSC 2000 3.0 or HH/SC NRSC 3000 3.0.**	NRSC 2000 (Fundamental Molecular and Cellular Neuroscience) or NRSC 3000 (Molecular and Cellular Basis of Perception and Cognition) as core courses in the neuroscience program will provide the necessary background, and even more relevant background, for KINE 3670
BIOL 4310 3.00 **Physiology of Circadian Timing**	Prerequisites: SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 3060 4.00	Prerequisites: SC/BIOL 2020 3.00 (Biochemistry), SC/BIOL 2021 3.00 (Cell Biology), SC/BIOL 3060 4.00 (Animal Physiology) **or HH/SC NRSC 2000 3.0 and HH/SC NRSC 3000 3.0**	NRSC 3000 (Molecular and Cellular Neurobiology) as a core course in the neuroscience program will provide the necessary background, and even more relevant background, for BIOL 4310. The three other courses each only provide a specific small amount of background, which will be covered in NRSC 2000 and NRSC 3000
BIOL 4370 3.00 **Neurobiology**	Prerequisites: SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 3060 4.00	Prerequisites: SC/BIOL 2020 3.00 (Biochemistry), SC/BIOL 2021 3.00 (Cell Biology), SC/BIOL 3060 4.00 (Animal Physiology) **or HH/SC NRSC 2000 3.0 and HH/SC NRSC 3000 3.0**	NRSC 3000 (Molecular and Cellular Neurobiology) as a core course in the neuroscience program will provide the necessary background, and even more relevant background, for BIOL 4370. The three other courses each only provide a specific small amount of background, which will be covered in NRSC 2000 and NRSC 3000

KINE 4230 3.00 **Neuronal Development for Activity and Health**	Prerequisite: HH/KINE 3012 3.00 *(Human Physiology II)*	Prerequisite: HH/KINE 3012 3.00 *(Human Physiology II)* **or HH/SC NRSC 2000 3.0 or HH/SC NRSC 3000 3.0.**	NRSC 2000 (Fundamental Molecular and Cellular Neuroscience) or NRSC 3000 (Molecular and Cellular Neurobiology) will provide the necessary background, and even more relevant background, for KINE 4230
KINE 4505 3.00 **Neurophysiology of Movement in Health and Disease**	Prerequisite: AS/HH/SC/KINE 3012 3.00 *(Human Physiology II)* or AS/HH/SC/KINE 3020 3.00 *(Skilled learning and motor performance)*	Prerequisite: AS/HH/SC/KINE 3012 3.00 or AS/HH/SC/KINE 3020 3.00 **or HH/SC NRSC 2000 3.0 and HH/SC NRSC 2100 3.0**	NRSC 2000 (Fundamental Molecular and Cellular Neuroscience) and NRSC 2100 (Systems, Behavioural and Cognitive Neuroscience) will provide the necessary background, and even more relevant background, for KINE 4505
PSYC 4080 6.00 **Neuropsychology of Abnormal Behaviour**	Prerequisites: HH/SC/PSYC 1010 6.00 with a minimum grade of C; HH/SC/PSYC 2030 3.00 *(Research methods)*; one of HH/SC/PSYC 2021 3.00 (Statistics Methods I), HH/SC/PSYC 2020 6.00; HH/SC/PSYC 2240 3.00 or HH/PSYC 3145 3.00; HH/PSYC 3140 3.00 (after Winter 2002) or AS/SC/PSYC 3140 3.00 or HH/PSYC 3215 3.00.	Prerequisites: HH/SC/PSYC 1010 6.00 with a minimum grade of C; HH/SC/PSYC 2030 3.00; one of HH/SC/PSYC 2021 3.00, HH/SC/PSYC 2020 6.00, **or HH/KINE 2050 3.0 or SC/BIOL 2060 3.0**; HH/SC/PSYC 2240 3.00 or HH/PSYC 3145 3.00; HH/PSYC 3140 3.00 (after Winter 2002) or AS/SC/PSYC 3140 3.00 or HH/PSYC 3215 3.00	Since PSYC 4080 is one of the neuroscience electives, it should be available to NRSC students coming from any of the entry departments which will likely determine which statistics course they take (i.e. KINE 2050 or BIOL 2060)
KINE 3020 3.00 **Skilled Performance and Motor Learning**	Prerequisites: HH/SC/KINE 2050 3.00; AS/SC/PSYC 1010 6.00.	Prerequisites: HH/SC/KINE 2050 3.00 **HH/PSYC 2021 3.0, or SC/BIOL 2060 3.0**; AS/SC/PSYC 1010 6.00 or	Since KINE 3020 is one of the neuroscience electives, it should be available to NRSC students coming from any of the entry departments which will likely determine which statistics course they take (i.e. PSYCH 2021, or BIOL 2060)

BIOL 4380 3.00 **Systems Neuroscience**	Prerequisite: SC/BIOL 3060 4.00 *(Animal Physiology)*.	Prerequisite: SC/BIOL 3060 4.00 **or HH/SC NRSC 2100 3.0**	NRSC 2100 (Systems, Behavioural and Cognitive Neuroscience), as one of the core required courses to the Neuroscience program, will provide the necessary background for BIOL 4380
KINE 4225 3.00 **Principles of Neuro-motor Learning**	*Prerequisite: HH/KINE 2050 3.00, HH/KINE 3020 3.00*	Prerequisite: HH/KINE 2050 3.00 or **HH/PSYC 2021 3.0, or SC/BIOL 2060 3.0**, and HH/KINE 3020 3.00 **or HH/SC NRSC 2100 3.0**	NRSC 2100 (Systems, Behavioural and Cognitive Neuroscience), as one of the core required courses to the Neuroscience program, will provide the necessary background for KINE 4225. The statistics courses offered by the other two entry departments should be sufficient.
KINE 4500 3.00 **Neural Control of Movement**	AS/HH/SC/KINE 3020 3.00 or permission of the course director.	AS/HH/SC/KINE 3020 3.00 or permission of the course director, or **HH/SC NRSC 2100 3.0**	NRSC 2100 (Systems, Behavioural and Cognitive Neuroscience), as one of the core required courses to the Neuroscience program, will provide the necessary, and even relevant, background for KINE 4500.

Summary of the Major Modification of the Environmental Science program

Prepared by Alex Mills, working group participant

What is the current Environmental Science program?

- It is a specialized Honours program with 2 streams, Life Sciences and Physical Sciences
- It's a program offered by the Faculty of Science
- It's a program largely created by the Geography group in LA&PS but housed in Science because it is a BSc
- The Life Sciences stream is approximately equal parts Biology and Geography
- The Physical Sciences stream has much less Biology and it includes more physical science, including climatology
- The program is small (<50 students), but between the two streams, the Life Sciences is considerably more popular.

Why is it being modified now?

- The Faculty of Environmental Studies merged with the LA&PS Geography group in 2020
- The Faculty has become the Faculty of Urban and Environmental Change (FEUC), and it has been overhauling its programs
- The Environmental Science program has low enrollments, and all the programs in FES have been relatively under-enrolled in recent years
- The new Faculty is able to confer BSc degrees and has undertaken an active part in curating this new joint degree with the Faculty of Science

What has the process been?

- A working group was established in the Spring of 2019 to generate a revised program
- This group has included active members from Biology (Tamara Kelly, Roberto Quinlan at an earlier stage, Alex Mills), with members from the new Faculty, as well as individuals in the office of the Vice Provost (Academic), and also Associate Dean (Students) Michael Scheid.
- The group included membership from Lassonde (ESSE) until a relatively late stage – until the point when a third stream, Climate Change, was abandoned.
- After the program had been largely assembled (Fall 2020), a focus group of Jennifer Korosi (Geography), Tamara Kelly, and Alex Mills completed the program in a more detailed manner

What are the major curricular changes?

- The program is no longer a Specialized Honours program; it is now an Honours Major program, and there is a Bachelor (90 credit) program as well
- The two current streams (Life Sciences; Physical Sciences) are being replaced with two new streams (Biodiversity and Conservation; Environmental Dynamics). There was a third stream in development, but its content could not be resolved by the working group; it may appear as an independent program outside our Faculty in the future
- The program relies on existing courses in BIOL, GEOG, and ENVS. There is one new 4th year capstone course.
- This program has Learning Outcomes; none had been articulated for the former program (to my knowledge); see Appendices A through C

How is it governed?

- Students will be able to enter the program, without first selecting a stream, through either the Faculty of Science or FEUC; that will be their home Faculty
- It is not the case that the Biodiversity and Conservation stream is "ours" and the Environmental Dynamics stream is "theirs"
- Consequently, advising will be done by both Faculties, irrespective of stream
- The program establishes a standing Environmental Science Committee (ESC) with membership from both Faculties that will deal with administrative arrangements; see Appendix E
- Both Deans have confirmed that there will be a Memorandum of Understanding (MOU) for the program, and this is in draft form; its purpose is to fairly allocate costs, benefits, and responsibilities between the two Faculties

What is the timing?

- It is less dire for the Faculty of Science to get this launched right away, but it is of great significance for our colleagues in FEUC
- The goal is to have the program operational in September 2021, and this means being approved at Senate in February 2021

Major Modifications to Existing Programs
Proposal

Major Modifications Proposal

1. **Faculty**: Environmental and Urban Change / Science (Dept. of Biology)

2. **Department**:

3. **Program**: Environmental Science

4. **Degree Designation**: Bachelor of Science

5. **Type of Modification**: (***Example: deletion of or change to a field; changes to program requirements / content that affects the learning outcomes***.):

Changes to program requirements, changes to program options, revisions to program structure and streams, streams renamed, revisions to articulation of program learning outcomes, addition of EUC as a Faculty approved to offer the program.

6. **Location: (*current campus and, if applicable, proposed*)**: Keele Campus

7. **Effective Date**: September 2021

---

8. **Provide a general description of the proposed changes to the program**:

The existing specialized honours program provides a foundation in Physical Geography with a choice of one of two streams: Life Sciences and Physical Sciences.

The proposed program includes a core set of courses in years 1-4 with two specialized streams for students to choose from: *Environmental Dynamics* and *Biodiversity and Conservation*. This program has a new 4th year interdisciplinary Capstone for Environmental Science students completing an Honours degree and a set of electives that can be taken by students completing an	**Honours**	**Bachelor**

Honours or Bachelors degree in either stream.		
Science Requirements	15	15
Non-Science Requirements	12	12
Major Core Requirements	27	24
Stream Core Requirements	18	15
Program Electives	18	9
Free Electives	30	15
	120	**90**

For the Honours program, in **YEAR 1 all** students will take:

- GEOG 1401 3.0 Physical Geography: Weather and Climate
- GEOG 1402 3.0 Physical Geography: Dynamic Earth
- BIOL 1000 3.0 Cells, Molecular Biology, & Genetics
- BIOL 1001 3.0 Evolution, Ecology, Biodiversity, and Conservation Biology
- Foundation Science (6.0 in PHYS or CHEM)
- Foundation Math 6.0
- Foundation Computer Science 3.0

YEAR 2 all student will take:

- GEOG 2401 3.0 Hydrosphere I
- GEOG 2420 3.0 Statistical Analysis OR BIOL 2060.3 Statistics for Biologists
- BIOL 2050 3.0 Ecology

Students will take the following based on choice of stream:

Environmental Dynamics	Biodiversity & Conservation
• GEOG 2402 3.0 Hydrosphere II • GEOG 2500 3.0 Vegetation and Soils • GEOG 2600 3.0 Geomorphology	• BIOL 2040 3.0 Genetics • BIOL 2080 3.0 Ecology in Practice – Research Fundamentals in Ecology and Evolution • BIOL 2010 3.0 Plant Biology

YEARS 3 & 4 all students will take:

- NEW 4xxx 3.0 Capstone

Plus 3 credits from

- ENVS 3420 3.0 Environmental Law
- ENVS 3430 3.0 Environmental Assessment

- ENVS 4445 3.0 Ontario Environmental Politics and Policy

Students will take the following based on choice of stream:

Environmental Dynamics	Biodiversity & Conservation
• GEOG 3540 3.0 Field Studies in Physical Geography Plus 6 credits from: • GEOG 3100 3.0 Global Biogeochemical Cycles • GEOG 3500 3.0 Biogeography (cross-listed as BIOL 3500) • GEOG 3700 3.0 Disaster! Earth's Extreme Events	• BIOL 3001 3.0 Field Course • BIOL 4245 3.0 Conservation Biology (cross-listed as ENVS 4110) Plus 3 credits from: • BIOL 3171 3.0 Population Ecology • BIOL 3172 3.0 Community Ecology • BIOL 4070 3.0 Behavioural Ecology

Students have a list of program electives that can be taken by students in either stream for the remainder credits in their degree. See Appendix D.
This proposed program is more streamlined, more collaborative, has more clearly articulated Learning Outcomes, and is designed with fewer requirements than the current version. Its two streams are also more reflective of 21st century trends and issues. These changes mean that a student's pathway through the program will be clearer and more interdisciplinary, which can improve student experience and retention.

9. **Provide the rationale for the proposed changes**:

In the fall of 2019, the members of the Department of Geography (LA&PS) and the Faculty of Environmental Studies approved a motion to form a new merged Faculty of Environmental and Urban Change (EUC). This Faculty has been approved and launched in September 2020. With the vision to be an international leader of critical and innovative environmental, urban, and geographic knowledges and skills in pursuit of sustainability and justice, EUC is eagerly anticipating its first cohort of students in September 2021. The formal proposal for this new Faculty identifies the programs to be offered and this major modification accomplishes aspects of the changes needed to implement the curriculum articulated in the proposal.

The goals of this curriculum modification were as follows:

1. Grow number of students in the BSc
2. Grow options for students within degree
3. Use existing courses effectively
4. Support collaboration across Faculty lines
5. Simplify curricular pathways
6. Establish a learning outcomes orientation
7. Develop a future-focused program

Revised and focused programs will provide greater clarity and structure for pathways through programs and options for minoring in different parts of the new Faculty. Modifications to this program will provide greater visibility and clarity to the program. In particular, the revised program will improve the navigation of the higher education years and enhance overall student and campus experiences.

Currently a BSc Specialized Honours, the revised program will be offered as an Honours degree (120 credits) and a Bachelor's degree (90 credits). A Minor is planned for the future. A streamlined curriculum makes it possible to add a minor or undergraduate certificate from another area of studies within Science, EUC or another Faculty at York. These new options provide more choice for students at a time when enrolments in Environmental Science programs at other universities are increasing, public awareness regarding the urgent need to address environmental issues is growing, and employment opportunities are increasing.

The existing program draws courses primarily from Geography and Biology. The proposal formalizes the program as a joint offering by, and collaboration between two, Faculties: Science and Environmental and Urban Change. The merger between Geography and FES has highlighted the expertise in Environmental Science now located in EUC and, with the program, the Faculty of Environmental and Urban Change will add a Bachelor of Science to its degree offerings.

10. **Comment on the alignment between the program changes with Faculty and/or University academic plans**:

This program is integral to the curricular offerings in the Faculty of Environmental and Urban Change. As stated in the Proposal for the Creation of a Faculty of Environmental and Urban Change, "Environmental Science remains a high-demand program. Current demand analysis suggests that high school students passionate about environmental issues are more likely to select a science-based environmental program. York University has not benefited from this demand relative to others given existing fragmentation and confusion in environmental science programs spanning numerous faculties. A consolidated, multiple pathway program is envisioned and being developed around issues of climate change, biodiversity conservation, and physical geography to attract and retain students." The revised program will also enhance the visibility of the Faculty of Science's participation in this important program area.

The proposal is informed by and responsive to many aspects of the University Academic Plan 2020-2025. The program advances research programs, partnerships and initiatives that align with the Strategic Research Plan, in particular with the research stream "Public Engagement for a Just and Sustainable World." The program is enthusiastic about playing an active role in responding to the University-wide challenge to contribute to the UN Sustainable Development Goals (SDGs). Climate change has been identified as "an area of strong interest and expertise at York, crossing many disciplines and functions, and engaging multiple SDGs…". The program has enormous capacity to

contribute to #6 (Clean Water and Sanitation), #7 (Affordable and Clean Energy), #12 (Responsible Consumption and Production), #13 (Climate Action), # 14 (Life Below Water) and #15 (Life on Land).

11. **If applicable, provide a detailed outline of the changes to the program and the associated learning outcomes, including how the proposed requirements will support the achievement of program learning outcomes. Programs should have eight to twelve program learning outcomes. (*i.e., the mapping of the courses to the program learning outcomes; graduate outcomes*)**:

Learning Outcomes have been refined and articulated more succinctly than previous versions. See Appendix A for Program Learning Outcomes and Appendix B for a mapping of how required courses meet these Outcomes.

See Appendix C for how these LOs map onto the ODLES however they are met by: Depth and Breadth of Knowledge (A, B, C, D), Knowledge of Methodologies (D, G, H), Application of Knowledge (C, D, E, G, H), Communication Skills (F), Awareness of Limits of Knowledge (H), Autonomy and Professional Capacity (D, E)

12. **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**:

Members of the former Department of Geography, the Department of Biology, the Department of Earth and Space Science Engineering and the former Faculty of Environmental Studies have worked collaboratively since April 2019, with support from the Chair of ASCP, the Vice-Provost Academic, a curriculum specialist, and colleagues assigned to support the merger between Geography and Environmental Studies. From April 2019 to September 2020, colleagues were provided with models, principles, and areas for discussion to develop a modified and more streamlined version of the curriculum. The proponents of the proposal reviewed developments with their colleagues in the contributing units following each meeting.

While curriculum was developed through these discussions, in October 2020, colleagues continued these discussions outside these formal meetings and developed a curricular structure that allowed for greater interdisciplinary collaboration in the core course offerings. Two new streams were agreed upon and these streams replace the existing streams currently offered in the program. Content in the former Physical Sciences stream has been replaced by a new and revised stream in *Environmental Dynamics*. Content covered in the Life Sciences stream has been replaced by a new and revised stream in *Biodiversity and Conservation*. A stream dedicated to Climate Change with participation from the Department of Earth and Space Science Engineering is envisioned for the future.

See Appendix F and G for supporting letters from the Dean of Science Rui Wang and the Dean of Environmental and Urban Change Alice Hovorka. The program will be administered jointly by the Faculty of Environmental and Urban Change and the Faculty of Science. Included in Appendix E is a document outlining program governance.

13. **If applicable, describe changes to any admission requirements and on the appropriateness of the revised requirements for the achievement of the program learning outcomes**:

Currently, there are different admission requirements for the Life Science and Physical Science stream; specifically, *Life Science* requires 4U Biology and *Physical Science* requires 4U Physics. However, admission requirements will change so that students will enter into the Environmental Science with one set of requirements – 4U Biology but not 4U Physics. With this change, students will have greater freedom to choose their stream in Year One of the program rather than in the application. Thus, while the current program admits students directly into one of the two streams, the proposed program will admit students into the BSc in Environmental Science.

Current Requirements:

Life Science Stream	Physical Science Stream
ENG4U SCH4U MHF4U MCV4U	
SBI4U	
One additional 4U or M course: SPH4U preferred	SPH4U
	One additional 4U or 4M course
Academic: high 70s to mid-80s	

Proposed Requirements:

Environmental Science
ENG4U SCH4U MHF4U MCV4U
SBI4U
One additional 4U or 4M course
Academic: high 70s to mid-80s

14. **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**:

The proposed program reduces the number of credits required to complete the program, adds new options, thus reducing need to offer under-subscribed courses, and streamlines course lists to ensure that all courses contribute to satisfying learning outcomes. The proposed program integrates existing courses from EUC that are new to

the program with courses taught in Science. One new course is proposed, the 4th year Capstone, which will be developed and taught jointly between EUC and Biology.

15. **When applicable, comment on the appropriateness of the revised mode(s) of delivery for the achievement of the program learning outcomes**:

While no changes to mode of delivery has been planned, the move to remote learning as a result of the COVID-19 health emergency has introduced a greater awareness of the benefits of and capacity for mounting some courses in an online or blended fashion.

A future plan includes identifying additional field 'experiences,' with students taking an accepted substitution, which would allow for greater curricular accessibility and achieve the same learning outcomes.

16. **Is the assessment of teaching and learning within the program changing? If so, comment on the appropriateness of the revised forms of assessment to the achievement of the program learning outcomes**:

The assessment and teaching and learning is not changing.

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

There are fewer than 50 students enrolled in the current program. Students will be contacted to meet with advisors to determine plans for completing the program in accordance with normal progression. Where possible, students will be given the choice about whether they complete the streams associated with the current program or are able to transfer to streams in the revised program. Students will not be required to complete aspects of the new program that are offered at a year-level other than their own. All students currently enrolled will be accommodated within a seven-year window.

18. **Provide the following appendices**:

    A) Program Learning Outcomes (eight to twelve) – See Appendix A

    B) A side-by-side comparison of the existing and proposed program requirements as they will appear in the Undergraduate or Graduate Calendar – See Appendix H

Appendix A: Program Learning Outcomes

By the end of their program, students will:

1. Articulate environmental dynamics and/or elements of biodiversity and conservation as key elements of understanding environmental science
2. Recognize the complex biophysical processes that explain variations in landforms, ecosystems, and biota in space and time and assess their implications
3. Describe, synthesize, and evaluate the causes and impacts of dynamics and implications of global environmental change
4. Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, investigating, analyzing, and interpreting intertwined climatological, ecological, and biophysical systems in both the field and laboratory
5. Work collaboratively to address scientific and practical solutions to environmental challenges
6. Effectively communicate concepts, arguments, analyses, and/or data for different audiences in different forms including, but not limited to, oral, written, technical, verbal, and/or visual forms
7. Convert questions about the environment into scientifically testable hypotheses or devise studies that implement the scientific method
8. Evaluate and effectively use concepts, theories, and tools that respond to environmental science challenges in ways that recognize the limits of the scientific knowledge and processes

Appendix B: Mapped Learning Outcomes to Program Courses

Courses	Learning Outcomes							
	A	B	C	D	E	F	G	H
	Articulate environmental dynamics and/or elements of biodiversity and conservation as key elements of understanding environmental science	Recognize the complex biophysical processes that explain variations in landforms, ecosystems, and biota in space and time and assess their implications	Describe, synthesize, and evaluate the causes and impacts of dynamics and implications of global environmental change	Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, investigating, analyzing, and interpreting intertwined climatological, ecological, and biophysical systems in both the field and laboratory	Work collaboratively to address scientific and practical solutions to environmental challenges	Effectively communicate concepts, arguments, analyses, and/or data for different audiences in different forms including, but not limited to, oral, written, technical, verbal, and/or visual forms	Convert questions about the environment into scientifically testable hypotheses or devise studies that implement the scientific method	Evaluate and effectively use concepts, theories, and tools that respond to environmental science challenges in ways that recognize the limits of the scientific knowledge and processes
CORE								
GEOG 1401 3.0 Weather and Climate		1	1	1		1		
GEOG 1402 3.0 Dynamic Earth		1	1	1		1		
BIOL 1000.3 Cells, Molecular Biology, & Genetics			1	1		1	1	1
BIOL 1001.3 Evolution, Ecology, Biodiversity, and Conservation Biology			1	1		1	1	1
GEOG 2401.3 Hydrosphere I		1	1	1	1		1	
GEOG 2420.3 Statistical Analysis OR BIOL 2060.3 Statistics for Biologists				1		1	1	
BIOL 2050.3 Ecology	1	1	1		1	1	1	1
ENVS 3420.3 Environmental Law					1	1		1
ENVS 3430.3 Environmental Assessment			1	1	1	1		1
ENVS 4445.3 Ontario Environmental Politics and Policy					1	1		1
NEW 4xxx.3 Capstone		1	1	1	1	1	1	

Updated December 8, 2020

Stream Core - Environmental Dynamics								
GEOG 2402.3 Hydrosphere II	1	1	1	1	1		1	
GEOG 2500 3.00 Introduction to Soils and Vegetation	1	1	1	1		1	1	
GEOG 2600 3.00 Geomorphology I	1	1	1			1		
GEOG 3540 3.0 Field Studies in Physical Geography	1			1	1		1	1
GEOG 3500.3 Biogeography	1	1	1	1	1	1	1	1
GEOG 3700.3 Disaster! Earth's Extreme Events	1		1			1		1
GEOG 3100 3.0 Global Biogeochemical Cycling	1	1	1		1	1	1	1
Stream Core - Biodiversity & Conservation								
BIOL 2040.3 Genetics	1					1		
BIOL 2080.3 Practical Methods in Ecology	1		1	1	1	1	1	1
BIOL 2010.3 Plant Biology	1	1	1	1	1	1	1	1
BIOL 3001.3 Field Course	1	1		1	1	1	1	1
BIOL 3171.3 Population Ecology	1	1	1	1	1	1	1	1
BIOL 3172.3 Community Ecology	1	1	1	1	1	1	1	1
BIOL 4070.3 Behavioural Ecology			1			1	1	1
BIOL 4245.3 Conservation Biology	1		1	1	1		1	

Appendix C: Program Learning Outcomes Mapped onto ODLES

		1	2	3	4	5	6
		Depth and Breadth of Knowledge	Knowledge of Methodologies	Application of Knowledge	Communication Skills	Awareness of Limits of Knowledge	Autonomy and Professional Capacity
A	Articulate environmental dynamics and/or elements of biodiversity and conservation as key elements of environmental science knowledge	1					
B	Recognize the complex biophysical processes that explain variations in landforms, ecosystems, and biota in space and time and assess their implications	1					
C	Describe, synthesize, and evaluate the causes and impacts of dynamics and implications of global environmental change	1		1			
D	Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, investigating, analyzing, and interpreting intertwined climatological, ecological, and biophysical systems in both the field and laboratory	1	1	1			1
E	Work collaboratively to address scientific and practical solutions to environmental challenges			1	1		1
F	Effectively communicate concepts, arguments, analyses, and/or data for different audiences in different forms including, but not limited to, oral, written, technical, verbal, and/or visual forms				1		
G	Convert questions about the environment into scientifically testable hypotheses or devise studies that implement the scientific method		1	1		1	
H	Evaluate and effectively use concepts, theories, and tools that respond to environmental science challenges in ways that recognize the limits of the scientific knowledge and processes		1	1		1	

Appendix D: Program Electives (3.0 credits unless otherwise indicated)

BIOL 3002	Field Course
BIOL 3200	Evolution
BIOL 3250.4	Experimental Design
BIOL 3280.4	Freshwater Biology
BIOL 4000 (.3 or .8)	Honours Thesis in Biology
BIOL 4255/ENVS 4111	Biodiversity
BIOL 4250	Birds and the Environment
BIOL 4700	Current Topics in Environmental Biology
ENVS 3410	The Science of Pollution
ENVS 4447	Northern Ecosystems: A Natural History of Arctic Regions
GEOG 3200	Terrestrial Ecosystems
GEOG 3900	Physical Geography of the City
GEOG 4000.6	Honour's Thesis in Geography
GEOG 4180	Lab Methods
GEOG 4200	Stream Ecosystems
GEOG 4410	Deserts
GEOG 4500	Northern Forest Environments
GEOG 4541	Advanced Field Studies
GEOG 4600	Rivers
STS 4655	From Ark to Anthropocene

Elective if not used as program requirement

BIOL 3001	Field Course
BIOL 3171	Population Ecology
BIOL 3172	Community Ecology
BIOL 4070	Behavioural Ecology
BIOL 4245/ENVS 4110	Conservation Biology
GEOG 3100	Global Biogeochemical Cycles
BIOL/GEOG 3500	Biogeography
GEOG 3700	Disaster! Earth's Extreme Events

Program Electives with GEOG 2402 as pre-requisite

GEOG 4205	Climates of High Latitudes
GEOG 4210	Hydrometeorology
GEOG 4215	Ecological Climatology
GEOG 4310	Dynamics of Snow and Ice
GEOG 4400	Physical Hydrology & Water Resources

Program Electives with BIOL 2010 or 2040 or 2080 as pre-requisite

BIOL 4095	Applied Plant Ecology
BIOL 4390	Population Genetics

Appendix E: Environmental Science Governance Draft

The Bachelor of Science in Environmental Science is housed and governed jointly by the Faculty of Science and the Faculty of Environmental and Urban Change. Contributions to the program are from faculty members in the Department of Biology and EUC. An MOU between the Deans of Science and EUC outlines the teaching resources in the form of courses and level of full-time faculty participation as instructors, program administration (academic and administrative), student space, facilities, enrolment targets, and revenue sharing. The principles informing the MOU also inform this document, which focuses on the collegial oversight of the program and the student experience.

Principles

1. Equitable Responsibility: Collegial governance depends upon the input of the two contributing groups in relation to core aspects of the program. Each partner has primary responsibility to fulfil its part of the roles and responsibilities in relation to the core aspects of the program and the stream to which it contributes. Changes proposed to a stream or components within it will be brought to the program committee (see 2. Below) for consideration with understanding that proponents of a stream have subject matter expertise.
2. Environmental Science Committee (ESC): A standing committee of the two contributing Faculties will be established with equal representation. The committee will include a representative of each Faculty's Dean's Office as well as any academic with administrative/co-ordinator roles for the BSc in Environmental Science.
3. Mandate of the ESC: a brief mandate of the committee will be approved by each of the participating Faculties (or relevant Department as appropriate). The committee develops and approves the terms of reference (terms of membership, goals, deliverables, decision making process, communication, approval processes for new curriculum, resources, ongoing and cyclical program review and evaluation). Central to the Committee's mandate is review and revision of curriculum needs and initiatives, marketing, recruitment and enrolment. The Committee also provides advice to the respective Faculties on matters related to the scheduling of courses, advising, resources, and administrative support, and to the respective Deans on matters of advising, teaching assignments, TA assignments, and complement planning.
4. Supporting Positions: Informed by the respective Deans.

Appendix F: Letter of Support from Dean of Science Rui

[these letters should identify the commitment to offerings and to ongoing collaboration to continue to strengthen the program as well as acknowledgement of an MOU regarding shared resources and governance].

Appendix G: Dean of Environmental and Urban Change Alice Hovorka

[these letters should identify the commitment to offerings and to ongoing collaboration to continue to strengthen the program as well as acknowledgement of an MOU regarding shared resources and governance].

Appendix H: Side-by-side comparison of the existing and proposed program requirements in the Undergraduate Calendar

~~**Environmental Science**~~	**Environmental Science**
	Honours Program
~~**Non-Science Requirement**~~ ~~The non-science requirement provides a broad perspective on current scholarship and the diversity of human experience. These courses are also expected to enhance students' critical skills in reading, writing and thinking, and contribute to their preparation for post-university life.~~	**Non-Science Requirement** The non-science requirement provides a broad perspective on current scholarship and the diversity of human experience. These courses are also expected to enhance students' critical skills in reading, writing and thinking, and contribute to their preparation for post-university life.
~~Requirements for BSc, Honours BSc, iBSc~~ ~~Candidates~~ ~~All degree candidates in the above programs must complete a minimum of 12 credits from two different areas of study, including at least three credits from each area, subject to the restrictions noted below.~~ ~~For the purposes of this regulation "different area" means offered by different academic units such as divisions, departments or Faculties~~	**EUC students:** The Humanities requirement can be satisfied by taking ENVS 1010 3.00 Introduction to Environmental Documentaries and ENVS 1122 3.00 The land we're on: treaties, art and environment or any other 1000-level humanities general education course (at least 6 credits) **not listed as either satisfying the Social Science.** The Social Sciences Requirement can be completed by GEOG 1000 6.00 The World Today: An Introduction to World Geography or any other 1000-level social sciences general education course (at least 6 credits) **not listed as either satisfying the Humanities requirement.**
~~**Residency Requirement**~~ ~~A minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University.~~	**Faculty of Science students:** Students must complete a minimum of 12 credits from two different areas of study, including at least three credits from each area. For the purposes of this regulation "different area" means offered by different

~~This is a Specialized Honours program offered with two streams – Life Sciences or Physical Sciences.~~
 	
~~The program core is defined as (39 credits):~~
• ~~SC/GEOG 1400 6.00 (cross-listed to: EU/GEOG 1400 6.00);~~
• ~~SC/GEOG 2400 6.00 (cross-listed to: EU/GEOG 2400 6.00);~~
• ~~SC/GEOG 2500 3.00 (cross-listed to: EU/GEOG 2500 3.00) or SC/GEOG 2600 3.00 (cross-listed to: EU/GEOG 2600 3.00);~~
• ~~six credits from:~~
  ○ ~~SC/GEOG 2610 3.00 (cross-listed to: EU/GEOG 2610 3.00);~~
  ○ ~~SC/GEOG 3200 3.00 (cross-listed to: EU/GEOG 3200 3.00);~~
  ○ ~~SC/GEOG 3500 3.00 (cross-listed to: EU/GEOG 3500 3.00, SC/BIOL 3500 3.00);~~
  ○ ~~SC/GEOG 4180 4.00 (cross-listed to: EU/GEOG 4180 4.00);~~
  ○ ~~SC/GEOG 4200 3.00 (cross-listed to: EU/GEOG 4200 3.00);~~
  ○ ~~SC/GEOG 4500 3.00 (cross-listed to: EU/GEOG 4500 3.00);~~
• ~~six credits from:~~
  ○ ~~SC/GEOG 4205 3.00 (cross-listed to: EU/GEOG 4205 3.00);~~
  ○ ~~SC/GEOG 4210 3.00 (cross-listed to: EU/GEOG 4210 3.00);~~
  ○ ~~SC/GEOG 4310 3.00 (cross-listed to: EU/GEOG 4310 3.00);~~
	academic units such as divisions, departments or Faculties. Options are listed at the Faculty of Science page "Choosing non-science general education courses" (https://www.yorku.ca/science/my-degree/program-requirements/choosing-non-science-general-education-courses/).
	
	Residency Requirement
	A minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University.
	
	This program includes a core set of courses in years 1-4 with two specialized streams for students to choose from: Environmental Dynamics or Biodiversity and Conversation. This program has a new 4th year interdisciplinary Capstone for all Environmental Science students completing an Honours degree and a set of electives that can be taken by students in either stream.
	
	The program core is defined as (27 credits):
	• SC/BIOL 1000 3.00;
	• SC/BIOL 1001 3.00;
	• SC/GEOG 1401 3.00 (cross-listed to EU/GEOG 1401 3.00);
	• SC/GEOG 1402 3.00 (cross-listed to EU/GEOG 1402 3.00);
	• SC/BIOL 2050 3.00;
	• SC/GEOG 2401 3.00 (cross-listed to EU/GEOG 2401 3.00);
	• SC/BIOL 2060 3.00 or SC/GEOG 2420 3.00 (cross-listed to EU/GEOG 2420 3.00);
	• Three credits from:
	  ○ EU/ENVS 3420 3.00,
	  ○ EU/ENVS 3430 3.00,
	  ○ EU/ENVS 4445 3.00;
	• NEW 4xxx.3 Capstone.

~~o SC/GEOG 4400 3.00 (cross-listed to: EU/GEOG 4400 3.00);~~ ~~o SC/GEOG 4600 3.00 (cross-listed to: EU/GEOG 4600 3.00);~~ ~~• 12 additional credits from geography courses (including three credits in statistics and three credits in a geography field course for students in the physical sciences stream).~~ ~~Specialized Honours – Life Sciences stream~~ ~~A. General education:~~ ~~• non-science requirement: 12 credits;~~ ~~• mathematics: SC/MATH 1505 6.00, or both SC/MATH 1013 3.00 and SC/MATH 1014 3.00;~~ ~~• computer science: LE/EECS 1520 3.00 or LE/EECS 1540 3.00;~~ ~~• foundational science: SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00; SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00~~ ~~B. Major requirements:~~ ~~• The program core above (39 credits);~~ ~~• SC/BIOL 2010 4.00; SC/BIOL 2030 4.00; SC/BIOL 2050 4.00; SC/BIOL 2060 3.00;~~ ~~• one ecology field course (SC/BIOL 3001 3.00 or SC/BIOL 3001 2.00);~~ ~~• 15 additional credits chosen from the following:~~ ~~o a second ecology field course (SC/BIOL 3002 3.00 or SC/BIOL 3002 2.00),~~ ~~o SC/BIOL 3170 3.00,~~ ~~o SC/BIOL 4000 8.00,~~ ~~o SC/BIOL 4020 3.00,~~ ~~o SC/BIOL 4070 3.00,~~ ~~o SC/BIOL 4080 3.00,~~ ~~o SC/BIOL 4090 4.00,~~ ~~o SC/BIOL 4095 3.00,~~ ~~o SC/BIOL 4100 3.00,~~ ~~o SC/BIOL 4120 3.00,~~ ~~o SC/BIOL 4130 3.00,~~	Honours – Environmental Dynamics Stream A. General Education • Non-science requirement: 12 credits; • Mathematics: SC/MATH 1505 6.00, or both SC/MATH 1013 3.00 and SC/MATH 1014 3.00; • Computer science: LE/EECS 1520 3.00 or LE/EECS 1540 3.00; • Foundational science: SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or SC/PHYS 1421 3.00 and SC/PHYS 1422 3.00, or SC/PHYS 1011 3.00 and SC/PHYS 1012 3.00. B. Major Requirements • The program core above (27 credits) • SC/GEOG 2402 3.00 (cross-listed to EU/GEOG 2402 3.00); • SC/GEOG 2500 3.00 (cross-listed to EU/GEOG 2500 3.00); • SC/GEOG 2600 3.00 (cross-listed to EU/GEOG 2600 3.00); • SC/GEOG 3540 3.00 (cross-listed to EU/GEOG 3540 3.00); • Six credits from: o SC/GEOG 3100 3.00 (cross-listed to EU/GEOG 3100 3.00), o SC/GEOG 3500 3.00 (cross-listed to EU/GEOG 3500 3.00 and SC/BIOL 3500 3.00), o SC/GEOG 3700 3.00 (cross-listed to EU/GEOG 3700 3.00); • 18 additional credits chosen from the following: o SC/BIOL 3001 3.00, o SC/BIOL 3171 3.00, o SC/BIOL 3172 3.00, o SC/BIOL 3200 3.00, o SC/BIOL 3250 4.00, o SC/BIOL 3280 4.00, o SC/BIOL 4000 3.00 or 6.00, o SC/BIOL 4070 3.00,

~~o SC/BIOL 4230 4.00;~~ ~~o SC/BIOL 4240 4.00;~~ ~~o SC/BIOL 4245 3.00;~~ ~~o SC/BIOL 4250 3.00;~~ ~~o SC/BIOL 4255 3.00;~~ ~~o SC/BIOL 4260 3.00;~~ ~~o SC/BIOL 4265 3.00;~~ ~~o SC/BIOL 4340 3.00;~~ ~~o SC/BIOL 4400 3.00;~~ ~~o SC/BIOL 4420 3.00;~~ ~~**Note:** at least 12 credits from the major courses (BIOL or GEOG) must be at the 4000 level.~~ ~~C. Science breadth: satisfied by above requirements.~~ ~~D. Upper level requirement: a minimum of 42 credits at the 3000 or higher level.~~ ~~E. Additional elective credits, as required for an overall total of at least 120 credits.~~ ~~F. Standing requirement: to graduate in an Honours program requires successful completion of all Faculty requirements and program required courses and a minimum cumulative credit-weighted grade point average of 5.00 (C+) over all courses completed.~~ ~~Specialized Honours – Physical Sciences stream~~ ~~A. General education:~~ ~~• non-science requirement: 12 credits;~~ ~~• mathematics: SC/MATH 1013 3.00; SC/MATH 1014 3.00;~~ ~~• computer science: LE/EECS 1540 3.00;~~ ~~• foundational science: SC/CHEM 1000 3.00; SC/CHEM 1001 3.00; SC/PHYS 1011 3.00 or SC/PHYS 1411 3.00 or SC/PHYS 1421 3.00 or SC/PHYS 1800 3.00, nd SC/PHYS 1012 3.00 or SC/PHYS 1412 3.00 or SC/PHYS 1422 3.00 or SC/PHYS 1801 3.00, or SC/PHYS 1010 6.00 or SC/PHYS 1410 6.00 or SC/PHYS 1420 6.00.~~	o SC/BIOL 4245 3.00 (cross-listed as EU/ENVS 4110 3.00), o SC/BIOL 4250 3.00, o SC/BIOL 4255 3.00 (cross-listed as EU/ENVS 4111 3.00), o SC/BIOL 4700 3.00, o EU/ENVS 3410 3.00, o EU/ENVS 4447 3.00, o SC/GEOG 3200 3.00 (cross-listed as EU/GEOG 3200 3.00), o SC/GEOG 3900 3.00 (cross-listed as EU/GEOG 3900 3.00), o SC/GEOG 4000 6.00 (cross-listed as EU/GEOG 4000 6.00), o SC/GEOG 4180 3.00 (cross-listed as EU/GEOG 4180 3.00), o SC/GEOG 4200 3.00 (cross-listed as EU/GEOG 4200 3.00), o SC/GEOG 4205 3.00 (cross-listed as EU/GEOG 4205 3.00), o SC/GEOG 4210 3.00 (cross-listed as EU/GEOG 4210 3.00), o SC/GEOG 4215 3.00 (cross-listed as EU/GEOG 4215 3.00), o SC/GEOG 4310 3.00 (cross-listed as EU/GEOG 4310 3.00), o SC/GEOG 4400 3.00 (cross-listed as EU/GEOG 4400 3.00), o SC/GEOG 4410 3.00 (cross-listed as EU/GEOG 4410 3.00), o SC/GEOG 4500 3.00 (cross-listed as EU/GEOG 4500 3.00),

~~B. Major requirements:~~

- ~~The program core above (39 credits);~~
- ~~LE/ESSE 2010 3.00; LE/ESSE 2470 3.00;~~
- ~~SC/CHEM 2030 3.00; SC/PHYS 2020 3.00;~~
- ~~SC/MATH 1025 3.00; SC/MATH 2015 3.00; SC/MATH 2270 3.00;~~
- ~~LE/ESSE 3030 3.00; LE/ESSE 3130 3.00; LE/ESSE 4220 3.00;~~
- ~~six additional credits chosen from:~~
  - ~~LE/ESSE 3040 3.00,~~
  - ~~LE/ESSE 4050 3.00,~~
  - ~~LE/ESSE 4051 3.00,~~
  - ~~LE/ESSE 4120 3.00,~~
  - ~~LE/ESSE 4130 3.00,~~
  - ~~LE/ESSE 4140 3.00,~~
  - ~~LE/ESSE 4150 3.00,~~
  - ~~LE/ESSE 4160 3.00,~~
  - ~~LE/ESSE 4230 3.00,~~
  - ~~LE/ESSE 4240 3.00,~~
  - ~~LE/ESSE 4300 3.00 (atmospheric science topics),~~
  - ~~SC/MATH 3241 3.00.~~

~~**Note:** at least 12 credits from the major courses (ESSE or GEOG) must be at the 4000 level.~~

~~C. Science breadth: satisfied by above requirements.~~

~~D. Upper level requirements: at least 42 credits at the 3000 or higher level.~~

~~E. Additional elective credits, as required for an overall total of at least 120 credits,~~

~~F. Standing requirements: to graduate in an Honours program requires successful completion of all Faculty requirements and program required courses and a minimum credit-weighted grade point average of 5.00 (C+) over all courses completed.~~

~~Environmental Science Courses~~

~~The following list includes required and elective courses in the Specialized Honours BSc program in Environmental Science.~~

~~Geography~~

- SC/GEOG 4541 3.00 (cross-listed as EU/GEOG 4541 3.00),
- SC/GEOG 4600 3.00 (cross-listed as EU/GEOG 4600 3.00),
- SC/STS 4655 3.00,

if not used as program requirement:

- SC/GEOG 3100 3.00 (cross-listed as EU/GEOG 3100 3.00),
- SC/ GEOG 3500 3.00 (cross-listed as EU/GEOG 3500 3.00 and SC/BIOL 3500 3.00),
- SC/GEOG 3700 3.00 (cross-listed as EU/GEOG 3700 3.00),

with BIOL 2010 or 2040 or 2080 as pre-requisite

- SC/BIOL 4095 3.00,
- SC/BIOL 4390 3.00;

Note: at least 12 credits from the major courses (BIOL or ENVS or GEOG) must be at the 4000 level.

C. Science breadth: satisfied by above requirements.

D. Upper level requirement: a minimum of 42 credits at the 3000 or higher level.

E. Additional elective credits, as required for an overall total of at least 120 credits.

F. Standing requirement: to graduate in an Honours program requires successful completion of all Faculty requirements and program required courses and a minimum cumulative credit-weighted grade point average of 5.00 (C+) over all courses completed.

Honours – Biodiversity and Conservation Stream

A. General Education

- Non-science requirement: 12 credits;

• ~~SC/GEOG 2400 6.00 (cross-listed to: EU/GEOG 2400 6.00)~~
• ~~SC/GEOG 2500 3.00 (cross-listed to: EU/GEOG 2500 3.00)~~
• ~~SC/GEOG 2600 3.00 (cross-listed to: EU/GEOG 2600 3.00)~~
• ~~SC/GEOG 2610 3.00 (cross-listed to: EU/GEOG 2610 3.00)~~
• ~~SC/GEOG 3200 3.00 (cross-listed to: EU/GEOG 3200 3.00)~~
• ~~SC/GEOG 3500 3.00 (cross-listed to: EU/GEOG 3500 3.00, SC/BIOL 3500 3.00)~~
• ~~SC/GEOG 4180 4.00 (cross-listed to: EU/GEOG 4180 4.00)~~
• ~~SC/GEOG 4200 3.00 (cross-listed to: EU/GEOG 4200 3.00)~~
• ~~SC/GEOG 4205 3.00 (cross-listed to: EU/GEOG 4205 3.00)~~
• ~~SC/GEOG 4210 3.00 (cross-listed to: EU/GEOG 4210 3.00)~~
• ~~SC/GEOG 4215 3.00 (cross-listed to: EU/GEOG 4215 3.00)~~
• ~~SC/GEOG 4310 3.00 (cross-listed to: EU/GEOG 4310 3.00)~~
• ~~SC/GEOG 4400 3.00 (cross-listed to: EU/GEOG 4400 3.00)~~
• ~~SC/GEOG 4500 3.00 (cross-listed to: EU/GEOG 4500 3.00)~~
• ~~SC/GEOG 4541 3.00 (cross-listed to: EU/GEOG 4541 3.00)~~
• ~~SC/GEOG 4600 3.00 (cross-listed to: EU/GEOG 4600 3.00)~~
~~Biology~~
• ~~SC/BIOL 2010 4.00~~
• ~~SC/BIOL 2030 4.00~~
• ~~SC/BIOL 2050 4.00~~
• ~~SC/BIOL 2060 3.00~~
• ~~SC/BIOL 3001 2.00 (ecology sections) (cross-listed to: SC/ENVB 3001 2.00)~~
• ~~SC/BIOL 3001 3.00 (ecology sections) (cross-listed to: SC/ENVB 3001 3.00)~~
	• Mathematics: SC/MATH 1505 6.00, or both SC/MATH 1013 3.00 and SC/MATH 1014 3.00;
	• Computer science: LE/EECS 1520 3.00 or LE/EECS 1540 3.00;
	• Foundational science: SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or SC/PHYS 1421 3.00 and SC/PHYS 1422 3.00, or SC/PHYS 1011 3.00 and SC/PHYS 1012 3.00.
	
	B. Major Requirements
	• The program core above (27 credits);
	• SC/BIOL 2010 3.00;
	• SC/BIOL 2040 3.00;
	• SC/BIOL 2080 3.00;
	• SC/BIOL 3001 3.00;
	• SC/BIOL 4245 3.00;
	• Three credits from:
	  ○ SC/BIOL 3171 3.00,
	  ○ SC/BIOL 3172 3.00,
	  ○ SC/BIOL 4070 3.00;
	• 18 additional credits chosen from the following:
	  ○ SC/BIOL 3002 3.00,
	  ○ SC/BIOL 3200 3.00,
	  ○ SC/BIOL 3250 4.00,
	  ○ SC/BIOL 3280 4.00,
	  ○ SC/BIOL 4000 3.00 or 6.00,
	  ○ SC/BIOL 4095 3.00,
	  ○ SC/BIOL 4255 3.00 (cross-listed as EU/ENVS 4111 3.00),
	  ○ SC/BIOL 4250 3.00,
	  ○ SC/BIOL 4390 3.00,
	  ○ SC/BIOL 4700 3.00,
	  ○ EU/ENVS 3410 3.00,
	  ○ EU/ENVS 4447 3.00,
	  ○ SC/GEOG 3100 3.00 (cross-listed as EU/GEOG 3100 3.00),
	  ○ SC/GEOG 3200 3.00 (cross-listed as EU/GEOG 3200 3.00),
	  ○ SC/GEOG 3500 3.00 (cross-listed as EU/GEOG 3500 3.00 and SC/BIOL 3500 3.00),

• ~~SC/BIOL 3002 2.00 (ecology sections) (cross-listed to: SC/ENVB 3002 2.00)~~ • ~~SC/BIOL 3002 3.00 (ecology sections) (cross-listed to: SC/ENVB 3002 3.00)~~ • ~~SC/BIOL 3170 3.00~~ • ~~SC/BIOL 4000 8.00 (cross-listed to: SC/ENVB 4000 8.00)~~ • ~~SC/BIOL 4070 3.00~~ • ~~SC/BIOL 4080 3.00~~ • ~~SC/BIOL 4090 4.00~~ • ~~SC/BIOL 4095 3.00~~ • ~~SC/BIOL 4100 3.00~~ • ~~SC/BIOL 4130 3.00~~ • ~~SC/BIOL 4230 4.00~~ • ~~SC/BIOL 4240 4.00~~ • ~~SC/BIOL 4245 3.00~~ • ~~SC/BIOL 4250 3.00~~ • ~~SC/BIOL 4255 3.00 (cross-listed to: EU/ENVS 4111 3.00)~~ • ~~SC/BIOL 4260 3.00~~ • ~~SC/BIOL 4265 3.00~~ • ~~SC/BIOL 4340 3.00~~ • ~~SC/BIOL 4400 3.00~~ • ~~SC/BIOL 4420 3.00~~ ~~Earth and Atmospheric Science~~ • ~~LE/ESSE 2010 3.00~~ • ~~LE/ESSE 2470 3.00~~ • ~~LE/ESSE 3030 3.00 (cross-listed to: SC/PHYS 3080 3.00)~~ • ~~LE/ESSE 3040 3.00~~ • ~~LE/ESSE 3130 3.00 (cross-listed to: SC/CHEM 3060 3.00)~~ • ~~LE/ESSE 4050 3.00~~ • ~~LE/ESSE 4051 3.00~~ • ~~LE/ESSE 4120 3.00~~ • ~~LE/ESSE 4130 3.00~~ • ~~LE/ESSE 4140 3.00~~ • ~~LE/ESSE 4160 3.00~~ • ~~LE/ESSE 4220 3.00~~ • ~~LE/ESSE 4230 3.00~~ • ~~LE/ESSE 4240 3.00~~	○ SC/GEOG 3700 3.00 (cross-listed as EU/GEOG 3700 3.00), ○ SC/GEOG 3900 3.00 (cross-listed as EU/GEOG 3900 3.00), ○ SC/GEOG 4000 6.00 (cross-listed as EU/GEOG 4000 3.00), ○ SC/GEOG 4180 3.00 (cross-listed as EU/GEOG 4180 3.00), ○ SC/GEOG 4200 3.00 (cross-listed as EU/GEOG 4200 3.00), ○ SC/GEOG 4410 3.00 (cross-listed as EU/GEOG 4410 3.00), ○ SC/GEOG 4500 3.00 (cross-listed as EU/GEOG 4500 3.00), ○ SC/GEOG 4541 3.00 (cross-listed as EU/GEOG 4541 3.00), ○ SC/GEOG 4600 3.00, (cross-listed as EU/GEOG 4600 3.00) ○ SC/STS 4655 3.00, *if not used as program requirement:* ○ SC/BIOL 3171 3.00, ○ SC/BIOL 3172 3.00, ○ SC/BIOL 4070 3.00, *with GEOG 2402 as pre-requisite:* ○ SC/GEOG 4205 3.00 (cross-listed as EU/GEOG 4205 3.00), ○ SC/GEOG 4210 3.00 (cross-listed as EU/GEOG 4210 3.00), ○ SC/GEOG 4215 3.00 (cross-listed as EU/GEOG 4215 3.00), ○ SC/GEOG 4310 3.00 (cross-listed as EU/GEOG 4310 3.00),

	o SC/GEOG 4400 3.00 (cross-listed as EU/GEOG 4400 3.00. **Note:** at least 12 credits from the major courses (BIOL or ENVS or GEOG) must be at the 4000 level. C. Science breadth: satisfied by above requirements. D. Upper level requirement: a minimum of 42 credits at the 3000 or higher level. E. Additional elective credits, as required for an overall total of at least 120 credits. F. Standing requirement: to graduate in an Honours program requires successful completion of all Faculty requirements and program required courses and a minimum cumulative credit-weighted grade point average of 5.00 (C+) over all courses completed. **Bachelor Program** **Non-Science Requirement** The non-science requirement provides a broad perspective on current scholarship and the diversity of human experience. These courses are also expected to enhance students' critical skills in reading, writing and thinking, and contribute to their preparation for post-university life. **EUC students:** The Humanities requirement can be satisfied by taking ENVS 1010 3.00 Introduction to Environmental Documentaries and ENVS 1122 3.00 The land we're on: treaties, art and environment or any other 1000-level humanities general education course (at least 6 credits) **not listed as either satisfying the Social Science.**

	The Social Sciences Requirement can be completed by GEOG 1000 6.00 The World Today: An Introduction to World Geography or any other 1000-level social sciences general education course (at least 6 credits) **not listed as either satisfying the Humanities requirement.** **Faculty of Science students:** Students must complete a minimum of 12 credits from two different areas of study, including at least three credits from each area. For the purposes of this regulation "different area" means offered by different academic units such as divisions, departments or Faculties. Options are listed at the Faculty of Science page "Choosing non-science general education courses" (https://www.yorku.ca/science/my-degree/program-requirements/choosing-non-science-general-education-courses/). **Residency Requirement** A minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University. This program includes a core set of courses with two specialized streams for students to choose from: Environmental Dynamics or Biodiversity and Conversation. This program has a set of electives that can be taken by students in either stream. The program core is defined as (24 credits): • SC/BIOL 1000 3.00; • SC/BIOL 1001 3.00; • SC/GEOG 1401 3.00 (cross-listed to EU/GEOG 1401 3.00);

	• SC/GEOG 1402 3.00 (cross-listed to EU/GEOG 1402 3.00);
	• SC/BIOL 2050 3.00;
	• SC/GEOG 2401 3.00 (cross-listed to EU/GEOG 2401 3.00);
	• SC/BIOL 2060 3.00 or SC/GEOG 2420 3.00 (cross-listed to EU/GEOG 2420 3.00);
	• Three credits from:
	  o EU/ENVS 3420 3.00,
	  o EU/ENVS 3430 3.00,
	  o EU/ENVS 4445 3.00.
	
	Bachelor – Environmental Dynamics Stream
	
	A. General Education
	• Non-science requirement: 12 credits;
	• Mathematics: SC/MATH 1505 6.00, or both SC/MATH 1013 3.00 and SC/MATH 1014 3.00;
	• Computer science: LE/EECS 1520 3.00 or LE/EECS 1540 3.00;
	• Foundational science: SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or SC/PHYS 1421 3.00 and SC/PHYS 1422 3.00, or SC/PHYS 1011 3.00 and SC/PHYS 1012 3.00.
	
	B. Major Requirements
	• The program core above (24 credits)
	• SC/GEOG 2402 3.00 (cross-listed to EU/GEOG 2402 3.00),
	• SC/GEOG 2500 3.00 (cross-listed to EU/GEOG 2500 3.00),
	• SC/GEOG 2600 3.00 (cross-listed to EU/GEOG 2600 3.00);
	• SC/GEOG 3540 3.00 (cross-listed to EU/GEOG 3540 3.00);
	• Three credits from:
	  o SC/GEOG 3100 3.00 (cross-listed to EU/GEOG 3100 3.00),
	  o SC/GEOG 3500 3.00 (cross-listed to EU/GEOG 3500 3.00 and SC/BIOL 3500),

	○ SC/GEOG 3700 3.00 (cross-listed to EU/GEOG 3700 3.00); • 9 additional credits chosen from the following: ○ SC/BIOL 3001 3.00, ○ SC/BIOL 3002 3.00, ○ SC/BIOL 3171 3.00, ○ SC/BIOL 3172 3.00, ○ SC/BIOL 3200 3.00, ○ SC/BIOL 3250 4.00, ○ SC/BIOL 3280 4.00, ○ SC/BIOL 4000 3.00 or 6.00, ○ SC/BIOL 4070 3.00, ○ SC/BIOL 4245 3.00 (cross-listed as EU/ENVS 4110 3.00), ○ SC/BIOL 4250 3.00, ○ SC/BIOL 4255 3.00 (cross-listed as EU/ENVS 4111 3.00), ○ SC/BIOL 4700 3.00, ○ EU/ENVS 3410 3.00, ○ EU/ENVS 4447 3.00, ○ SC/GEOG 3200 3.00 (cross-listed as EU/GEOG 3200 3.00), ○ SC/GEOG 3900 3.00 (cross-listed as EU/GEOG 3900 3.00), ○ SC/GEOG 4000 6.00 (cross-listed as EU/GEOG 4000 6.00), ○ SC/GEOG 4180 3.00 (cross-listed as EU/GEOG 4180 3.00), ○ SC/GEOG 4200 3.00 (cross-listed as EU/GEOG 4200 3.00), ○ SC/GEOG 4205 3.00 (cross-listed as EU/GEOG 4205 3.00), ○ GEOG 4210 3.00 (cross-listed as EU/GEOG 4210 3.00), ○ GEOG 4215 3.00 (cross-listed as EU/GEOG 4215 3.00),

	○ SC/GEOG 4310 3.00 (cross-listed as EU/GEOG 4310 3.00), ○ SC/GEOG 4400 3.00 (cross-listed as EU/GEOG 4400 3.00), ○ SC/GEOG 4410 3.00 (cross-listed as EU/GEOG 4410 3.00), ○ SC/GEOG 4500 3.00 (cross-listed as EU/GEOG 4500 3.00), ○ SC/GEOG 4541 3.00 (cross-listed as EU/GEOG 4541 3.00), ○ SC/GEOG 4600 3.00 (cross-listed as EU/GEOG 4600 3.00), ○ SC/STS 4655 3.00, *if not used as program requirement:* ○ SC/GEOG 3100 3.00 (cross-listed as EU/GEOG 3100 3.00), ○ SC/GEOG 3500 3.00 (cross-listed as EU/GEOG 3500 3.00 and SC/BIOL 3500 3.00), ○ SC/GEOG 3700 3.00 (cross-listed as EU/GEOG 3700 3.00), *with BIOL 2010 or 2040 or 2080 as pre-requisite* ○ BIOL 4095 3.00, ○ BIOL 4390 3.00; C. Science breadth: satisfied by above requirements. D. Upper level requirement: a minimum of 18 credits at the 3000 level or above. E. Additional elective credits, as required for an overall total of at least 90 credits. F. Standing requirements: a minimum overall grade point average of 4.00 (C) is required in order to be eligible to graduate with a BSc degree (bachelor program).

	Bachelor – Biodiversity and Conservation Stream
	
	A. General Education
	• Non-science requirement: 12 credits;
	• Mathematics: SC/MATH 1505 6.00, or both SC/MATH 1013 3.00 and SC/MATH 1014 3.00;
	• Computer science: LE/EECS 1520 3.00 or LE/EECS 1540 3.00;
	• Foundational science: SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or SC/PHYS 1421 3.00 and SC/PHYS 1422 3.00, or SC/PHYS 1011 3.00 and SC/PHYS 1012 3.00.
	
	B. Major Requirements
	• The program core above (24 credits);
	• SC/BIOL 2010 3.00,
	• SC/BIOL 2040 3.00,
	• SC/BIOL 2080 3.00;
	• SC/BIOL 4245 3.00 (cross-listed as EU/ENVS 4110 3.00);
	• Three credits from:
	  o SC/BIOL 3171 3.00,
	  o SC/BIOL 3172 3.00,
	  o SC/BIOL 4070 3.00;
	• 9 additional credits chosen from the following:
	  o SC/BIOL 3001 3.00,
	  o SC/BIOL 3002 3.00,
	  o SC/BIOL 3200 3.00,
	  o SC/BIOL 3250 4.00,
	  o SC/BIOL 3280 4.00,
	  o SC/BIOL 4000 3.00 or 6.00,
	  o SC/BIOL 4095 3.00,
	  o SC/BIOL 4255 3.00 (cross-listed as EU/ENVS 4111 3.00),
	  o SC/BIOL 4250 3.00,
	  o SC/BIOL 4390 3.00,
	  o SC/BIOL 4700 3.00,
	  o EU/ENVS 3410 3.00,
	  o EU/ENVS 4447 3.00,
	  o SC/GEOG 3100 3.00 (cross-listed as EU/GEOG 3100 3.00),

	○ SC/GEOG 3200 3.00 (cross-listed as EU/GEOG 3200 3.00), ○ SC/GEOG 3500 3.00 (cross-listed as EU/GEOG 3500 3.00 and SC/BIOL 3500 3.00) ○ SC/GEOG 3700 3.00 (cross-listed as EU/GEOG 3700 3.00), ○ SC/GEOG 3900 3.00 (cross-listed as EU/GEOG 3900 3.00), ○ SC/GEOG 4000 6.00 (cross-listed as EU/GEOG 4000 6.00), ○ SC/GEOG 4180 3.00 (cross-listed as EU/GEOG 4180 3.00), ○ SC/GEOG 4200 3.00 (cross-listed as EU/GEOG 4200 3.00), ○ SC/GEOG 4410 3.00 (cross-listed as EU/GEOG 4410 3.00), ○ SC/GEOG 4500 3.00 (cross-listed as EU/GEOG 4500 3.00), ○ SC/GEOG 4541 3.00 (cross-listed as EU/GEOG 4541 3.00), ○ SC/GEOG 4600 3.00 (cross-listed as EU/GEOG 4600 3.00), ○ SC/STS 4655 3.00, *if not used as program requirement:* ○ SC/BIOL 3171 3.00, ○ SC/BIOL 3172 3.00, ○ SC/BIOL 4070 3.00, *with GEOG 2402 as pre-requisite:* ○ SC/GEOG 4205 3.00 (cross-listed as EU/GEOG 4205 3.00), ○ SC/GEOG 4210 3.00 (cross-listed as EU/GEOG 4210 3.00),

	○ SC/GEOG 4215 3.00 (cross-listed as EU/GEOG 4215 3.00), ○ SC/GEOG 4310 3.00 (cross-listed as EU/GEOG 4310 3.00), ○ SC/GEOG 4400 3.00 (cross-listed as EU/GEOG 4400 3.00). C. Science breadth: satisfied by above requirements. D. Upper level requirement: a minimum of 18 credits at the 3000 level or above. E. Additional elective credits, as required for an overall total of at least 90 credits. F. Standing requirements: a minimum overall grade point average of 4.00 (C) is required in order to be eligible to graduate with a BSc degree (bachelor program).