COUNCIL OF THE FACULTY OF SCIENCE

NOTICE OF MEETING

December 8, 2020

3pm – 4:30pm

via Zoom

AGENDA

1. Call to Order and Approval of Agenda
2. Chair's Remarks
3. Approval of November 10, 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. 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
      9.1.2 Vacancies report on the Standing Committees of FSc Council (items for action)
   9.2 Curriculum Committee (consent agenda items)
10. Other Business
   10.1 Inclusion of Student Caucus Representative Report
   10.2 Student workload and mental health

COUNCIL OF THE FACULTY OF SCIENCE

MINUTES

November 10, 2020

3pm – 4:30pm

via Zoom

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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 to the meeting and thank Mary-Helen Armour for her continuous support.
3. **Approval of October 13, 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 October 22, 2020

   4.2 Student Caucus Representative Report
   The Student Caucus shared their concerns on new structure of courses, and explained that online learning is not being absorbed as well as on campus learning, which may put students at a disadvantage when they take upper year courses.

   They continued that the number of students experiencing stress, anxiety and depression has significantly increased since switching to online learning due to COVID-19 and expressed how important a message from the Faculty acknowledging this is.

   In addition, the Wi-Fi socio-economic issue of internet connectivity has put some students at a severe disadvantage during test times. Proctor also flags students for cheating if their Wi-Fi cuts out. As a solution, Professors could give students take home tests/assignments instead of live examinations.

   A final concern surrounding examination scheduling was shared: core courses such as BIOL 1000 & CHEM 1000 were on the same day and many first-year students believed this hindered their success.
5. **Business Arising**
   There was none.
6. **Dean's Remarks**
   Dean Wang welcomed and thanked the student representatives for their participation and engagement as they are a critical part of the collegial governance. He acknowledged the concerns that were reported and re-assured the students that the Faculty and staff care, and have gone the extra mile to deliver courses online. He added that finding the right channel to communicate concerns is also important.

Dean Wang gave an enrolment update and praised the collective effort of the Faculty of Science as a whole. He reported that the Undergraduate Fall enrolment (FFTE) surpassed the 2020 target by 1.3% and has increased by 4.6% in comparison to 2019. He continued by reporting that 2020-21 Undergraduate enrolment (FFTE) increased by 8.3% in comparison to 2019-20, and surpassed the 2020-21 target by 5.2%. Masters Fall enrolment (FFTE) decreased by 6.1% in comparison to 2019 and PhD Fall enrolment (FFTE) increased by 4.9% in comparison to 2019.

Dean Wang reported that the mid-term budget review has been approved by the University.

He updated council that The Dean's Space Strategy Special Taskforce received white paper feedback from departments, faculties and more than 500 students. Feedback and advice will be implemented and a final white paper will be brought back to Faculty Council as an item for approval.

Dean Wang spoke of the major success of the Faculty of Science virtual graduation Reception that took place on October 28 with 100 graduates in attendance. The invited speakers at the Reception were Paula Wilson (Biology), Sergey Krylov (Chemistry), Amanda Liczner (PhD graduate), alumnus Samer Bishay and remarks from FGS Dean Loebel.

Dean Wang shared that York University recently featured several short videos, with one focused on the Advanced Light and Electron Microscopy Facility which is now fully digital, and will enhance the student remote learning experience.

Dean Wang shared the Faculty of Science Strategic Planning Process document with Council, detailing the mission, vision, objectives and internal and external stakeholder groups. He further explained in detail the 5 phases in the process:

Phase 1: Assessing the Landscape – Date Gathering & Analysis (October – December 2020)
Phase 2: Visioning and Divergent Brainstorming of Possibilities (January 28, 2021)
Phase 3: Convergent Filtering and Metrics (February 25, 2021)
Phase 4: Draft Strategic Plan – Stakeholders Consultation (March 2021)
Phase 5: Strategic Plan Endorsement (April 2021)

Council members were polled on their preference for the consultation process:
1. Virtual town hall meetings
OR
2. Written responses to surveys

Virtual town hall meetings received the most votes (20-18)

7. Associate Deans' and Head of Bethune College Remarks

Associate Dean, Research and Graduate Education, Jennifer Steeves, reminded and encouraged Faculty to apply for the wage subsidy program to support students engaged in research related activity.

On behalf of Associate Dean, Faculty Affairs, Gerald Audette, Jennifer gave an update that the EDI Committee will plan their first meeting very soon.

8. Reports from Science Representatives on Senate Committees

There was 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 reminded Faculty to nominate colleagues.

9.2 Curriculum Committee (consent agenda items)

There was some discussion and concerns around some items, but it was confirmed that:

"A consent agenda item is deemed to be approved unless, prior to the consent agenda item being reached, at least one Councilor advises the Chair of a request to debate it"

10. Other Business

10.1 Agenda Items for Information

10.1.1 KUALI CMS Presentation: An update on the new KUALI system for course development and proposals – Paul Mayol

10.1.2 York Cares United Way Campaign – Stephen Childs

Council was encouraged to pledge and donate to the United Way Campaign to help reach their goal of $150,000.

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

December 1, 2020

Ratification of Nominations

Committee of Equity, Diversity and Inclusivity
D. Harris

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 Dhalgham	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	VACANT	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	Ilo-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	VACANT	2020	2023
	Math & Stats	A. Chow	2020	2023
	STS	V. Pavri	2020	2023

Curriculum Committee Report

November 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 November 24, 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

1.1 GEOG

1.2.1 Retire course: SC/GEOG 1400 6.0 “Physical Geography”

1.2.2 Retire course: SC/GEOG 2400 6.0 “Hydrosphere”

1.2.3 New course: EU/GEOG 3100 3.0 “Global Biogeochemical Cycles”

1.2.4 New course: EU/GEOG 2401 3.0 “Hydrosphere I”

1.2.5 New course: EU/GEOG 2402 3.0 “Hydrosphere II”

1.2.6 New course: EU/GEOG 1401 3.0 “Physical Geography: Weather and Climate”

1.2.7 New course: EU/GEOG 1402 3.0 “Physical Geography: The Dynamic Earth”

1.2 CHEM

1.2.1 Change in degree requirements: BSc. Chemistry, Honours Major BSc. Chemistry, Specialized Honours BSc. Chemistry and Specialized Honours BSc. Chemistry in Pharmaceutical and Biological Stream – addition of a new course to the core requirements, SC/CHEM 2000 3.0.

1.3 MATH

1.3.1 Change in pre-requisite, title and calendar description: SC/MATH 4012 3.0 “Analysis IV”

1.3.2 Change in degree requirements: BSc. and BA degree in Pure and Applied Math program change to Specialized Honours, Honours Majors and Bachelors

1.3.3 Change in calendar description: SC/MATH 3001 3.0 “Real Analysis II”

faculty of environmental and urban change

undergraduate curriculum subcommittee

COURSE CHANGE FORM

Date of Submission:	Sept. 14, 2020	**Effective Session:**	Fall 2021
Faculty: Please indicate all relevant Faculties.	(1) Environmental and Urban Change (2) Science	**Course Rubric:**	ENST or GEOG

Course Number and Credit Value:	GEOG 1400 6.00
Course Title:	Physical Geography

Minor Course Changes

	in course number (same year level)		in cross-listing
	in course title (editorial)		in equivalents/exclusions
	in calendar description (editorial)		in course format/mode of delivery
	in pre/co-requisites	X	retire/expire course

Other (please specify):

Major Course Changes

Please note that a New Course Proposal Form is required for proposals that involve substantive changes to the nature/focus of the course, including substantive changes:

- in year level
- in credit value (including conversion of an existing course to a Foundations course)
- in course title
- in calendar description (must be no more than 40 to 60 words)

YORK UNIVERSITÉ UNIVERSITY

Change From:	**Change To:**
EU/ENVS/GEOG	EU/ENVS/GEOG

Rationale:

EU/GEOG 1400 6.00 (also listed as SC/GEOG 1400) will be retired and replaced by two new 3.00 credit courses, GEOG 1401 Physical Geography: Weather and Climate, and GEOG 1402 Physical Geography: The Dynamic Earth.

Confirmation of Consultation/Approval:

The relevant FES curriculum subcommittees will **not** consider proposals courses that are currently cross-listed, and for proposals to change or add cross-listings or equivalents/exclusions, without approval from all of the relevant parties in other units/Faculties. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

faculty of environmental and urban change

undergraduate curriculum subcommittee

COURSE CHANGE FORM

Date of Submission:	Oct 5, 2020	**Effective Session:**	Fall 2021
Faculty: Please indicate all relevant Faculties.	(1) Environmental and Urban Change (2) Science	**Course Rubric:**	ENST or GEOG

Course Number and Credit Value:	GEOG 2400 6.00
Course Title:	Hydrosphere

Minor Course Changes

	in course number (same year level)		in cross-listing
	in course title (editorial)		in equivalents/exclusions
	in calendar description (editorial)		in course format/mode of delivery
	in pre/co-requisites	X	retire/expire course

Other (please specify):

Major Course Changes

Please note that a New Course Proposal Form is required for proposals that involve substantive changes to the nature/focus of the course, including substantive changes:

- in year level
- in credit value (including conversion of an existing course to a Foundations course)
- in course title
- in calendar description (must be no more than 40 to 60 words)

YORK UNIVERSITÉ UNIVERSITY

Change From:	**Change To:**
EU/ENVS/GEOG	EU/ENVS/GEOG

Rationale:

EU/GEOG 2400 6.00 (also listed as SC/GEOG 2400) will be retired and replaced by two new 3.00 credit courses, GEOG 2401 Hydrosphere I and GEOG 2402 Hydrosphere II.

Confirmation of Consultation/Approval:

The relevant FES curriculum subcommittees will **not** consider proposals courses that are currently cross-listed, and for proposals to change or add cross-listings or equivalents/exclusions, without approval from all of the relevant parties in other units/Faculties. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

NEW COURSE PROPOSAL FORM

Date of Submission:	October 12, 2020	**Effective Session:**	Winter 2021
Faculty: Please indicate all relevant Faculties.	Environmental and Urban Change	**Responsible Unit and Course Rubric:**	GEOG
Course Number: Special Topics courses *Include variance (e.g. ENVS 3800C 3.0 or GEOG 3800C 3.0, Variance is "C")*	3100	**Academic Credit Value:** For example, 3.0, 6.0, 9.0. Indicate both the fee and MET weight if different from the academic weight.	3.0
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Course Repository.	Global Biogeochemical Cycles		
Short Course Title: **Maximum 40 characters**, including punctuation and spaces.	Global Biogeochemical Cycles		

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

YORK UNIVERSITÉ UNIVERSITY

Brief Course Description:

No more than 40 to 60 words.

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. For editorial consistency, verbs should be in the present tense.

If applicable, include information regarding the language of instruction (if other than English), prerequisites and co-requisites, course equivalents/ exclusions, and other course notes.

Climate change and pollution have their roots in human disruptions of natural biogeochemical cycling. Biogeochemical cycles describe how matter flows through ecosystems under the influence of biological and physical processes. Explore fundamental concepts in biogeochemistry and trace the cycling of carbon, nitrogen, phosphorus, sulfur, and mercury at global and local scales through lectures, case studies, and problem-solving exercises.

Prerequisites: EU/SC/GEOG 1401 3.0 and EU/SC/GEOG 1402 3.0 (or AP/SC/GEOG 1400 6.0 prior to 2021)

Expanded Course Description:

This is the detailed course description, **including LEARNING OUTCOMES, topics/theories, learning objectives, a detailed list of week by week readings**, as it will appear in supplemental calendars.

Consider how the course responds to a diverse student population in its content, teaching methods and modes of assessment. Consider how the course meets the social justice orientation and equity commitment of the Faculty in encouraging students to examine various environments as shaped by race, class, disability, gender, gender-identity, sexuality and other axes of oppression.

Climate change and pollution have their roots in human disruptions of natural biogeochemical cycling. Biogeochemical cycles describe how matter flows through ecosystems under the influence of biological and physical processes. Explore fundamental concepts in biogeochemistry and trace the cycling of carbon, nitrogen, phosphorus, sulfur, and mercury at global and local scales through lectures, case studies, and problem-solving exercises.

Learning Outcomes:

(1) Explain the origin and evolution of biogeochemical systems
(2) Develop conceptual models to represent the biogeochemical cycling of carbon, nitrogen, phosphorus, sulfur, and mercury at global and local scales
(3) Apply biogeochemical knowledge and analytical tools to environmental problem solving

Textbook:

Schlesinger,W.H. and E.S.Bernhardt, 2020. Biogeochemistry: An Analysis of Global Change. Academic Press. (Elsevier), San Diego,4th Edition, 688 pp.

Supplemental Readings:

- Gorham, E., 1991. Biogeochemistry: its origins and development. Biogeochemistry, 13(3), pp.199-239.
- Hsu-Kim, H., Eckley, C.S. and Selin, N.E., 2018. Modern science of a legacy problem: mercury biogeochemical research after the Minamata Convention. Environmental Science: Processes & Impacts 20: 582-583.
- Johnson, J.A., 2019. Populating the periodic table: Nucleosynthesis of the elements. Science 363: 474-478.
- Hinckley, E.L.S., Crawford, J.T., Fakhraei, H. and Driscoll, C.T., 2020. A shift in sulfur-cycle manipulation from atmospheric emissions to agricultural additions. Nature Geoscience, pp.1-8.

List of Topics:

1. Earth as a Chemical System (Textbook Ch. 1; Gorham 1991; Johnson 2019)
2. Origins: Elements, Solar System, Solid Earth, Atmosphere & Oceans, Life & Metabolic Pathways (Textbook Ch. 2)
3. Biogeochemical Cycling in the Atmosphere (Textbook Ch. 3)
4. Biogeochemical Cycling in the Lithosphere (Textbook Ch. 4)
5. Biogeochemical Cycling on Land (Textbook Ch. 6)
6. Biogeochemical Cycling in Water (Textbook Chs. 7, 8, 9)
7. Global Carbon Cycle (Textbook Ch. 11)

8. Global Nitrogen Cycle (Textbook Ch. 12)
9. Global Phosphorus Cycle (Textbook Ch. 12)
10. Global Sulfur Cycle (Textbook Ch. 13; Hinckley et al. 2020)
11. Global Mercury Cycle (Textbook Ch. 13; Hsu-Kim et al. 2018)
12. Biogeochemical Perspectives on Global Environmental Change

Instruction/Course Format:

1. Planned frequency of offering and number of sections anticipated; e.g. every year, alternate years, etc.

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

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

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

5. In the absence of scheduled contact hours, please indicate how the course design encourages student engagement and supports students in achieving the learning objectives. Offer methods of teaching that take into account a diversity of student needs, learning styles and differing abilities.

6. Please describe the type of experiential education (blending theory and course work with concrete experience) and/or eLearning (using technology to support the students interaction with and access to the content, learning activities, with other students, and with faculty members in order to develop knowledge and skills) you will be using. If you are not using experiential education and/or eLearning, please explain why.

One section of this course will be offered every year.

Prof. Korosi and Prof. Thienpont are competent to teach this course. In the coming year, the course will likely be taught by Prof. Korosi.

Contact hours:

- Two 1.5-hour lectures per week

Experiential education:

This course will use classroom-focused experiential education mainly through the following three strategies:

(1) Case method learning
Students will develop biogeochemical knowledge and analytical skills through mini case studies that use real data. For example, the National Science Foundation's National Ecological Observatory Network (NEON) collects long-term open access ecological data to better understand how U.S. ecosystems are changing, and includes nutrient data in soils, sediments, biota, surface and groundwater. The Mackenzie DataStream is an open access data portal that archives water quality data in the Mackenzie River Basin.

(2) Role Playing
We will use role play to apply biogeochemistry knowledge and analytical tools to propose, critique and evaluate science-based solutions to management and policy challenges such as: (1) natural climate solutions to capture and store carbon in ecosystems and reduce greenhouse gas emissions from land surfaces; (2) best practices in forestry to protect water quality; (3) human health risks from mercury consumption; (4) eutrophication in the Great Lakes basin.

(3) Guest Speaker
A guest speaker who works on the interface of biogeochemistry and policy or industry will be invited. For example, there are several scientists working at Environment and Climate Change Canada laboratories in Toronto and Burlington who could be invited to give a guest lecture on biogeochemical research being done by ECCC in support of federal environmental policy. Potential topics could include mercury cycling in the Canadian Arctic, climate change, and pollutant emissions from the Alberta oil sands. Virtual conferencing tools can also be used to invite guest speakers who are not local to the Toronto area to participate.

eLearning:
This course uses eClass as a platform for making course materials available to students.

Evaluation:

Please provide a detailed description of the basis of evaluation for the proposed course, including the type and percentage value of each assignment.

If the course is to be integrated, the additional requirements for graduate students must also be provided.

If the proposed course is amenable to technologically mediated forms of delivery, please identify how the integrity of learning evaluation will be maintained (e.g. will "on-site" examinations be required, etc.) Specifically, please clearly indicate how the course will be organized for remote teaching: will be teaching synchronously and/or asynchronously?

Offer ways of evaluation that take into account a diversity of student needs, learning styles and differing abilities.

10% - Participation*
10% - Problem sets
30% - Case studies (3x10%)
20% - Role play group assignment
30% - Final exam (open book)

*Participation will be evaluated based on in-class activities such as building conceptual maps and iClicker quizzes.

Bibliography:

A library support statement is required from the bibliographer responsible for the relevant discipline to indicate whether resources are adequate to support the course.

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc. Include resources that represent diverse voices and cultural histories. If applicable, please distinguish required readings from suggested readings. *As well, please list any online resources*, and whether students will require internet access.

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

Textbook:

Schlesinger,W.H. and E.S.Bernhardt, 2020. Biogeochemistry: An Analysis of Global Change. Academic Press. (Elsevier), San Diego,4th Edition, 688 pp.

Supplemental Readings:

- Gorham, E., 1991. Biogeochemistry: its origins and development. Biogeochemistry, 13(3), pp.199-239.
- Hsu-Kim, H., Eckley, C.S. and Selin, N.E., 2018. Modern science of a legacy problem: mercury biogeochemical research after the Minamata Convention. Environmental Science: Processes & Impacts 20: 582-583.
- Johnson, J.A., 2019. Populating the periodic table: Nucleosynthesis of the elements. Science 363: 474-478.
- Hinckley, E.L.S., Crawford, J.T., Fakhraei, H. and Driscoll, C.T., 2020. A shift in sulfur-cycle manipulation from atmospheric emissions to agricultural additions. Nature Geoscience, pp.1-8.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. As well, please indicate if any other resources are required.

This committee will not approve a course unless it is satisfied that adequate resources are available to support it.

No special resources are required for this course. However, because the course integrates in-class active learning activities and group work, classrooms with benches or desks that can be easily organized into groups is preferable.

Course Rationale:

The following points should be addressed in the rationale:

1. Identify which degree program(s) the course contributes to (i.e., EAJ, SEM, GG, US, ES); and how the course contributes to the **learning outcomes** of the degree program(s).

2. How does the course contribute to the Faculty's social justice orientation and equity commitment?

3. Comment on the relationship of the proposed course to other existing offerings, particularly in terms of overlap in learning outcomes and/or content. If overlap exists, please indicate the nature and extent of consultation that has taken place. If the proposed course is to be cross-listed, integrated or listed as an equivalent/exclusion with another course, approval is required from all of the relevant Faculties/units.

4. If applicable, please indicate the relationship of the proposed course to interdisciplinary programs; i.e. for which interdisciplinary program(s) will the course count for major/minor credit. As well, please indicate the nature and extent of consultation that has taken place with the relevant interdisciplinary program coordinator(s).

5. The expected enrolment in the course.

This course is a core elective requirement for the BSc Environmental Science program. The course specifically addresses the following Program Learning Outcomes:

- Recognize the complex biophysical processes that explain patterns in landforms, ecosystems, and climate in space and time and assess their implications
- Describe, synthesize, and evaluate the causes and impacts of environmental change and biodiversity loss
- Work collaboratively across disciplines to address scientific and policy solutions to environmental challenges
- Effectively communicate concepts, arguments, analyses, and data for diverse audiences in multiple forms
- Develop questions about the environment into scientifically testable hypotheses and design studies that implement the scientific method

Social justice and equity:

Biogeochemistry is a science that provides a foundational framework for understanding the scientific basis of pollution, food and water security, and global environmental change. These challenges have a disproportionate impact on marginalized groups, and we will engage with these issues through case studies and role-playing exercises that engage with a diversity of ideas and perspectives. Clear expectations for classroom behaviors and attitudes will be established at the beginning to create a supportive and inclusive class climate.

Biogeochemistry is a discipline that integrates biology, geosciences, and chemistry, and as such requires a textbook to support student learning of complex biogeochemical principles. Copies of the textbook will be made available on loan to students through the library and the Geographic Resource Centre. Supplemental content and contributions by historically excluded groups will also be integrated throughout the course, and gender and cultural diversity will be considered when inviting guest speakers.

Relationship to existing offerings:

No overlap exists with other courses in EUC or other Faculties at York.

The course is to be cross-listed with the Faculty of Science (as EU/SC GEOG 3100)

Expected enrollment in the course is 30 students

Confirmation of Consultation/Approval:

If the proposed course is to be cross-listed, integrated, listed as an equivalent/exclusion with another course, or listed as a major/minor course option in an interdisciplinary program, approval from all of the relevant parties is also required. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

July 2020

faculty of environmental and urban change

undergraduate curriculum subcommittee

NEW COURSE PROPOSAL FORM

Date of Submission:	Oct 5, 2020	**Effective Session:**	Fall 2021
Faculty: Please indicate all relevant Faculties.	Environmental and Urban Change	**Responsible Unit and Course Rubric:**	GEOG
Course Number: Special Topics courses *Include variance (e.g. ENVS 3800C 3.0 or GEOG 3800C 3.0, Variance is "C")*	2401	**Academic Credit Value:** For example, 3.0, 6.0, 9.0. Indicate both the fee and MET weight if different from the academic weight.	3.0
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Course Repository.	Hydrosphere I		
Short Course Title: **Maximum 40 characters**, including punctuation and spaces.	Hydrosphere I		

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

YORK UNIVERSITÉ UNIVERSITY

Brief Course Description:

No more than 40 to 60 words.

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. For editorial consistency, verbs should be in the present tense.

If applicable, include information regarding the language of instruction (if other than English), prerequisites and co-requisites, course equivalents/ exclusions, and other course notes.

Examines the movement and storage of water in various phases near the Earth's surface and the energy required for fueling the hydrologic cycle. Basic atmospheric and hydrologic processes will be covered, and the flow of energy and water to and beneath the Earth's surface will be traced.
Prerequisite: EU/GEOG 1401 3.00 or SC/GEOG 1401 3.00 and EU/GEOG 1402 3.00 or SC/GEOG 1402 3.00 (prior to 2020: AP/GEOG 1400 6.00 or SC/GEOG 1400 6.00)

Expanded Course Description:

This is the detailed course description, **including LEARNING OUTCOMES, topics/theories, learning objectives**, **a detailed list of week by week readings**, as it will appear in supplemental calendars.

Consider how the course responds to a diverse student population in its content, teaching methods and modes of assessment. Consider how the course meets the social justice orientation and equity commitment of the Faculty in encouraging students to examine various environments as shaped by race, class, disability, gender, gender-identity, sexuality and other axes of oppression.

This course examines the movement and storage of water in various phases near the Earth's surface and the energy required for fueling the hydrologic cycle. The focus of the course is on the *interdependency* of water and energy in the Hydrosphere. The course begins with a discussion of basic atmospheric and hydrologic processes and then traces the flow of energy and water to and beneath the Earth's surface. We will also investigate some of the implications of these processes for land-use, the carbon budget and climate change. This course is designed to combine a theoretical understanding of the Hydrosphere with applied field science. Some experience in the use of spreadsheets (e.g. Excel), is an asset.

Learning Outcomes:

- A basic understanding of the fundamental linkages and interdependences of water and energy in the global Hydrosphere
- Develop a basic level of comprehension of key concepts such as radiative, conductive and convective energy transfer, open and closed systems, steady state and non-steady state systems, latent heats of vapourization and fusion, continental and oceanic water and energy budgets, precipitation, evapotranspiration, subsurface moisture flow and water table response. Gain an appreciation for environmental variability in space, ranging from a few centimeters to globally and their variability in time, ranging from several minutes to decades.
- Gain an appreciation for the attributes of different sensors and gain practical experience in sampling the environment and sensor's importance in the design of an experiment to provide hypothesis testing.
- Develop analytical skills to analyze temporal and spatial data using spreadsheets

Textbooks:

Oke, T.R., 1987*: Boundary Layer Climates*, 2nd Edition, Methuen, 435 pp.

Ward, R.C. and M. Robinson, 2000: *Principles of Hydrology*, 4th Edition, McGraw Hill, 450 pp.

Weekly Topics & Readings:

1. Introduction (W&R p 1-13; 367-369)
2. The nature of radiation; Solar radiation (Oke 1-32)
3. Radiation in the atmosphere; Global radiation balance (Oke p. 16-27)
4. Surface radiation balance; Humidity, evaporation, and condensation (Oke p. 29-32, 63-65)

5. Clouds and precipitation; Rainfall interception (W&R p. 14-40, 63-72)
6. Soil structure and soil water; Soil moisture potential (W&R p. 145-147, Oke p. 48-51)
7. Ground heat flux; Soil heat capacity and thermal conductivity (Oke p. 33-38, 42-46)
8. Thermal diffusivity & soil thermal cycles; Convection at the Earth's surface (Oke p. 39-42, 46-48)
9. Atmospheric turbulence; Sensible and latent heat fluxes (Oke p. 39-42, 59-69)
10. Bowen Ratio energy balances; Groundwater storage (Oke p. 69-76)
11. Groundwater storage (Oke p. 69-76, W&R p. 139-156)
12. Groundwater movement (W&R p. 139-176)

Instruction/Course Format:

1. Planned frequency of offering and number of sections anticipated; e.g. every year, alternate years, etc.

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

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

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

5. In the absence of scheduled contact hours, please indicate how the course design encourages student engagement and supports students in achieving the learning objectives. Offer methods of teaching that take into account a diversity of student needs, learning styles and differing abilities.

6. Please describe the type of experiential education (blending theory and course work with concrete experience) and/or eLearning (using technology to support the students interaction with and access to the content, learning activities, with other students, and with faculty members in order to develop knowledge and skills) you will be using. If you are not using experiential education and/or eLearning, please explain why.

Course offerings:

We anticipate this course will be offered every year, with one lecture section and two lab sections.

Instructors:

Prof. Kathy L. Young and Prof. Richard Bello are competent to teach this course, and will be likely to teach it in the coming year (team-taught)

Contact hours:

2 lecture hours per week
3 lab hours per week

Experiential education

This course includes an extensive field experimentation component where students will gain practical skills and experience in conducting analysis in a field setting. Field training and experience is fundamental to the professional development of environmental science graduates. Students will also gain practical relevant experience in data analysis and report writing, which are foundational to many different career pathways in the environmental sciences.

Evaluation:

Please provide a detailed description of the basis of evaluation for the proposed course, including the type and percentage value of each assignment.

If the course is to be integrated, the additional requirements for graduate students must also be provided.

If the proposed course is amenable to technologically mediated forms of delivery, please identify how the integrity of learning evaluation will be maintained (e.g. will "on-site" examinations be required, etc.) Specifically, please clearly indicate how the course will be organized for remote teaching: will be teaching synchronously and/or asynchronously?

Offer ways of evaluation that take into account a diversity of student needs, learning styles and differing abilities.

- Two tests worth 20% each (40% total)
- Four labs worth 60% (4x15%)

Bibliography:

A library support statement is required from the bibliographer responsible for the relevant discipline to indicate whether resources are adequate to support the course.

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc. Include resources that represent diverse voices and cultural histories. If applicable, please distinguish required readings from suggested readings. *As well, please list any online resources*, and whether students will require internet access.

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

Textbooks:

Oke, T.R., 1987*: Boundary Layer Climates*, 2nd Edition, Methuen, 435 pp. (edition 3 to be released soon)

Ward, R.C. and M. Robinson, 2000: *Principles of Hydrology*, 4th Edition, McGraw Hill, 450 pp.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. As well, please indicate if any other resources are required.

This committee will not approve a course unless it is satisfied that adequate resources are available to support it.

The Physical Geography undergraduate program has a dedicated field equipment technician and field sampling equipment that supports the lab component of this course.

Course Rationale:

The following points should be addressed in the rationale:

1. Identify which degree program(s) the course contributes to (i.e., EAJ, SEM, GG, US, ES); and how the course contributes to the **learning outcomes** of the degree program(s).

2. How does the course contribute to the Faculty's social justice orientation and equity commitment?

3. Comment on the relationship of the proposed course to other existing offerings, particularly in terms of overlap in learning outcomes and/or content. If overlap exists, please indicate the nature and extent of consultation that has taken place. If the proposed course is to be cross-listed, integrated or listed as an equivalent/exclusion with another course, approval is required from all of the relevant Faculties/units.

4. If applicable, please indicate the relationship of the proposed course to interdisciplinary programs; i.e. for which interdisciplinary program(s) will the course count for major/minor credit. As well, please indicate the nature and extent of consultation that has taken place with the relevant interdisciplinary program coordinator(s).

5. The expected enrolment in the course.

This course is a program core requirement for the BSc in Environmental Science. For the BSc in Environmental Science, the course specifically addresses the following Program Learning Outcomes:

- Recognize the complex biophysical processes that explain patterns in landforms, ecosystems, and climate in space and time and assess their implications
- Describe, synthesize, and evaluate the causes and impacts of environmental change and biodiversity loss
- Work collaboratively across disciplines to address scientific and policy solutions to environmental challenges
- Develop questions about the environment into scientifically testable hypotheses and design studies that implement the scientific method
- Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, analyzing, and interpreting interactions among climatological, ecological, and biophysical systems in both the field and laboratory

Social justice and equity:

Field work experience is fundamental to the training of students in the geosciences, but also is a strong barrier to equity and inclusion (Giles et al. 2020, Stokes et al. 2019). This is because field work experiences in undergraduate training are often conducted as intensive two-week field courses that can be cost-prohibitive and may require students to travel and make alternate caregiving or work arrangements. As well, students who did not have access to nature growing up are unlikely to have proper field clothing. In GEOG 2401, we conduct fieldwork on York's campus within the context of a typical course weekly schedule. We also provide students with chest waders to conduct sampling, and do not expect students to provide their own specific clothing or other personal equipment necessary to conduct fieldwork activities.

Stokes, A., Feig, A.D., Atchison, C.L. and Gilley, B., 2019. Making geoscience fieldwork inclusive and accessible for students with disabilities. *Geosphere*, *15*(6), pp.1809-1825.

Giles, S., Jackson, C. and Stephen, N., 2020. Barriers to fieldwork in undergraduate geoscience degrees. *Nature Reviews Earth & Environment*, *1*(2), pp.77-78.

Relationship to existing offerings:

No overlap exists with other courses. This course proposal is paired with a new course proposal for GEOG 2402 3.0 Hydrosphere II. Hydrosphere I introduces the physical principles of energy and water movement in the atmospheric boundary layer and the soil. Hydrosphere II applies these principles to ice and snow-covered landscapes, aquatic and marine systems, grasslands, agricultural landscapes and forests. Collectively,

GEOG 2401 and 2402 will replace GEOG 2400 6.0: Hydrosphere, converting a 6.0 credit course into two stand-alone 3.0 credit options.

The course is to be cross-listed with the Faculty of Science (as EU/SC GEOG 2401)

Expected enrollment in the course is 30-50 students

Confirmation of Consultation/Approval:

If the proposed course is to be cross-listed, integrated, listed as an equivalent/exclusion with another course, or listed as a major/minor course option in an interdisciplinary program, approval from all of the relevant parties is also required. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

July 2020

faculty of environmental and urban change

undergraduate curriculum subcommittee

NEW COURSE PROPOSAL FORM

Date of Submission:	Oct 5, 2020	**Effective Session:**	Winter 2021
Faculty: Please indicate all relevant Faculties.	Environmental and Urban Change	**Responsible Unit and Course Rubric:**	GEOG
Course Number: Special Topics courses *Include variance (e.g. ENVS 3800C 3.0 or GEOG 3800C 3.0, Variance is "C")*	2402	**Academic Credit Value:** For example, 3.0, 6.0, 9.0. Indicate both the fee and MET weight if different from the academic weight.	3.0
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Course Repository.	Hydrosphere II		
Short Course Title: **Maximum 40 characters**, including punctuation and spaces.	Hydrosphere II		

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

YORK UNIVERSITÉ UNIVERSITY

Brief Course Description:

No more than 40 to 60 words.

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. For editorial consistency, verbs should be in the present tense.

If applicable, include information regarding the language of instruction (if other than English), prerequisites and co-requisites, course equivalents/ exclusions, and other course notes.

Examines the physical processes and the environmental factors that govern the movement of water and energy in lakes, rivers, oceans and the soil-plant-atmosphere continuum. *Prerequisite: EU/GEOG 2401 3.00 or SC/GEOG 2401 3.00*

Expanded Course Description:

This is the detailed course description, **including LEARNING OUTCOMES, topics/theories, learning objectives**, **a detailed list of week by week readings**, as it will appear in supplemental calendars.

Consider how the course responds to a diverse student population in its content, teaching methods and modes of assessment. Consider how the course meets the social justice orientation and equity commitment of the Faculty in encouraging students to examine various environments as shaped by race, class, disability, gender, gender-identity, sexuality and other axes of oppression.

This course examines the movement and storage of water in various phases near the Earth's surface and the energy required for fueling the hydrologic cycle. The focus of the course is on the *interdependency* of water and energy in the Hydrosphere. This includes the physical processes and the environmental factors that govern the movement of water and energy in lakes, rivers, oceans and the soil-plant-atmosphere continuum. The course traces the flow of energy and water initially in simple vegetation-free environments, and ultimately in more complex forest systems, where the role of plants in the hydrologic cycle is emphasized. Aspects of the cryosphere (snow and ice), and the lateral redistribution of water as runoff on slopes and in drainage basins will also be examined. We will also investigate some of the implications of these processes for land-use, the carbon budget and climate change. This course is designed to combine a theoretical understanding of the Hydrosphere with applied field science. Some experience in the use of spreadsheets (e.g. Excel), is an asset.

Learning Outcomes:

Students will

- Gain an understanding of the fundamental linkages and interdependences of water and energy in the cryosphere, aquatic and marine environments, grassland, agricultural landscapes and forests.
- Learn the importance of differentiating between the state of variables in the environment and the fluxes of those variables and how these give rise to cycling rates and residence times.
- Gain an appreciation for environmental variability in space, ranging from a few centimeters to globally and their variability in time, ranging from several minutes to decades.
- Gain an appreciation for the attributes of different sensors and gain practical experience in sampling the environment and sensors' importance in the design of an experiment to render hypotheses testable.
- Gain experience in the interpretation of spatial environmental information from maps and temporal environmental information in graphs.
- Gain practical experience in the use of spreadsheets for data analysis and production of graphic information.

Textbooks:

Oke, T.R., 1987*: Boundary Layer Climates*, 2nd Edition, Methuen, 435 pp.

Ward, R.C. and M. Robinson, 2000: *Principles of Hydrology*, 4th Edition, McGraw Hill, 450 pp.

Weekly Topics & Readings:

1. Radiation and energy balance of snow and ice (Oke p. 12, 84-94; W&R p. 54-59)
2. Snow and ice meltwater; Radiation and energy balance of deserts (Oke p. 79-84; W&R p. 54-59, 287-294)
3. Radiation and energy balance of lakes and oceans; lake energetics and evaporation
4. Energy in the plant canopy; Ohm's law: stomatal control of transpiration (Oke p. 105-109)
5. Factors influencing stomatal resistance; CO_2 flux in plant canopies (Oke p. 110-120)
6. Sources and components of runoff; Hillslope and basin hydrology (W&R p. 256-259)
7. Hydrographs; Hydrologic regimes and flow variations (W&R p. 253-259)
8. Extremes of runoff (W&R p. 269-287)
9. Changing land use and runoff; Deforestation and the hydrologic cycle (W&R p. 272-279)
10. Radiation balance of plant canopies; Radiation balance of crops (Oke p. 120-130)
11. Energy balance of crops; Radiation balance of forests (Oke p. 134-154)
12. Energy balance of forests; Resistance framework and land use change (Oke p. 154-157).

Instruction/Course Format:

1. Planned frequency of offering and number of sections anticipated; e.g. every year, alternate years, etc.

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

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

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

5. In the absence of scheduled contact hours, please indicate how the course design encourages student engagement and supports students in achieving the learning objectives. Offer methods of teaching that take into account a diversity of student needs, learning styles and differing abilities.

6. Please describe the type of experiential education (blending theory and course work with concrete experience) and/or eLearning (using technology to support the students interaction with and access to the content, learning activities, with other students, and with faculty members in order to develop knowledge and skills) you will be using. If you are not using experiential education and/or eLearning, please explain why.

Course offerings:

We anticipate this course will be offered every year, with one lecture section and two lab sections.

Instructors:

Prof. Kathy L. Young and Prof. Richard Bello are competent to teach this course, and will be likely to teach it in the coming year (team-taught)

Contact hours:

2 lecture hours per week
3 lab hours per week

Experiential education

This course includes an extensive field experimentation component where students will gain practical skills and experience in conducting analysis in a field setting. Field training and experience is fundamental to the professional development of environmental science graduates. Students will also gain practical relevant experience in data analysis and report writing, which are foundational to many different career pathways in the environmental sciences.

Evaluation:

Please provide a detailed description of the basis of evaluation for the proposed course, including the type and percentage value of each assignment.

If the course is to be integrated, the additional requirements for graduate students must also be provided.

If the proposed course is amenable to technologically mediated forms of delivery, please identify how the integrity of learning evaluation will be maintained (e.g. will "on-site" examinations be required, etc.) Specifically, please clearly indicate how the course will be organized for remote teaching: will be teaching synchronously and/or asynchronously?

Offer ways of evaluation that take into account a diversity of student needs, learning styles and differing abilities.

- Two tests worth 20% each (40% total)
- Four labs worth 60% (4x15%)

Bibliography:

A library support statement is required from the bibliographer responsible for the relevant discipline to indicate whether resources are adequate to support the course.

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc. Include resources that represent diverse voices and cultural histories. If applicable, please distinguish required readings from suggested readings. *As well, please list any online resources*, and whether students will require internet access.

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

Textbooks:

Oke, T.R., 1987*: Boundary Layer Climates*, 2nd Edition, Methuen, 435 pp. (3rd edition so to be released)

Ward, R.C. and M. Robinson, 2000: *Principles of Hydrology*, 4th Edition, McGraw Hill, 450 pp.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. As well, please indicate if any other resources are required.

This committee will not approve a course unless it is satisfied that adequate resources are available to support it.

The Physical Geography undergraduate program has a dedicated field equipment technician and field measurement/sampling equipment that supports the lab component of this course.

Course Rationale:

The following points should be addressed in the rationale:

1. Identify which degree program(s) the course contributes to (i.e., EAJ, SEM, GG, US, ES); and how the course contributes to the **learning outcomes** of the degree program(s).

2. How does the course contribute to the Faculty's social justice orientation and equity commitment?

3. Comment on the relationship of the proposed course to other existing offerings, particularly in terms of overlap in learning outcomes and/or content. If overlap exists, please indicate the nature and extent of consultation that has taken place. If the proposed course is to be cross-listed, integrated or listed as an equivalent/exclusion with another course, approval is required from all of the relevant Faculties/units.

4. If applicable, please indicate the relationship of the proposed course to interdisciplinary programs; i.e. for which interdisciplinary program(s) will the course count for major/minor credit. As well, please indicate the nature and extent of consultation that has taken place with the relevant interdisciplinary program coordinator(s).

5. The expected enrolment in the course.

This course is a program core requirement for the BSc in Environmental Science. For the BSc in Environmental Science, the course specifically addresses the following Program Learning Outcomes:

- Recognize the complex biophysical processes that explain patterns in landforms, ecosystems, and climate in space and time and assess their implications
- Describe, synthesize, and evaluate the causes and impacts of environmental change and biodiversity loss
- Work collaboratively across disciplines to address scientific and policy solutions to environmental challenges
- Develop questions about the environment into scientifically testable hypotheses and design studies that implement the scientific method
- Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, analyzing, and interpreting interactions among climatological, ecological, and biophysical systems in both the field and laboratory

Social justice and equity:

Field work experience is fundamental to the training of students in the geosciences, but also is a strong barrier to equity and inclusion (Giles et al. 2020, Stokes et al. 2019). This is because field work experiences in undergraduate training are often conducted as intensive two-week field courses that can be cost-prohibitive and may require students to travel and make alternate caregiving or work arrangements. As well, students who did not have access to nature growing up are unlikely to have proper field clothing. In GEOG 2401, we conduct fieldwork on York's campus within the context of a typical course weekly schedule. We also provide students with chest waders to conduct sampling, and do not expect students to provide their own specific clothing or other personal equipment necessary to conduct fieldwork activities.

Stokes, A., Feig, A.D., Atchison, C.L. and Gilley, B., 2019. Making geoscience fieldwork inclusive and accessible for students with disabilities. *Geosphere*, *15*(6), pp.1809-1825.

Giles, S., Jackson, C. and Stephen, N., 2020. Barriers to fieldwork in undergraduate geoscience degrees. *Nature Reviews Earth & Environment*, *1*(2), pp.77-78.

Relationship to existing offerings:

No overlap exists with other courses. This course proposal is paired with a new course proposal for GEOG 2401 3.0 Hydrosphere I. Hydrosphere I introduces the physical principles of energy and water movement in the atmospheric boundary layer and the soil. Hydrosphere II applies these principles to ice and snow-covered landscapes, aquatic and marine

systems, grasslands, agricultural landscapes and forests. Collectively, GEOG 2401 and 2402 will replace GEOG 2400 6.0: Hydrosphere, converting a 6.0 credit course into two stand-alone 3.0 credit options.

The course is to be cross-listed with the Faculty of Science (as EU/SC GEOG 2401)

Expected enrollment in the course is 30-50 students

Confirmation of Consultation/Approval:

If the proposed course is to be cross-listed, integrated, listed as an equivalent/exclusion with another course, or listed as a major/minor course option in an interdisciplinary program, approval from all of the relevant parties is also required. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

July 2020

faculty of environmental and urban change

undergraduate curriculum subcommittee

NEW COURSE PROPOSAL FORM

Date of Submission:	Sept. 3, 2020	**Effective Session:**	Fall 2021
Faculty: Please indicate all relevant Faculties.	Environmental and Urban Change	**Responsible Unit and Course Rubric:**	GEOG
Course Number: Special Topics courses *Include variance (e.g. ENVS 3800C 3.0 or GEOG 3800C 3.0, Variance is "C")*	1401	**Academic Credit Value:** For example, 3.0, 6.0, 9.0. Indicate both the fee and MET weight if different from the academic weight.	3.0
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Course Repository.	Physical Geography: Weather and Climate		
Short Course Title: **Maximum 40 characters**, including punctuation and spaces.	Weather and Climate		

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

YORK UNIVERSITÉ UNIVERSITY

Brief Course Description:

No more than 40 to 60 words.

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. For editorial consistency, verbs should be in the present tense.

If applicable, include information regarding the language of instruction (if other than English), prerequisites and co-requisites, course equivalents/ exclusions, and other course notes.

What is climate change and how will it impact the environment? Learn how Earth's climate and weather systems work and explore the drivers of current and past climatic change. Discover how climate and climate change influence global biodiversity patterns. Gain practical experience applying the scientific method to address pressing environmental challenges related to climate change.

Expanded Course Description:

This is the detailed course description, **including LEARNING OUTCOMES, topics/theories, learning objectives**, **a detailed list of week by week readings**, as it will appear in supplemental calendars.

Consider how the course responds to a diverse student population in its content, teaching methods and modes of assessment. Consider how the course meets the social justice orientation and equity commitment of the Faculty in encouraging students to examine various environments as shaped by race, class, disability, gender, gender-identity, sexuality and other axes of oppression.

The Earth is constantly changing. Many of these changes are natural. More recently, humankind has imposed several new challenges for the planet and its inhabitants, including but not limited to habitat loss, pollution, loss of biodiversity, and climate change. Physical geography examines the natural processes occurring at the Earth's surface that provide the physical setting for human activities.

The total Earth system is divided into four realms, including land (lithosphere), water (hydrosphere), air (atmosphere), and living things (biosphere). Some systems occur at very small scales like that of an individual plant while others occur at very large scales encompassing the entire planet. Most systems do not operate independently but rather interact with several others.

A major objective of this introductory course is to provide students with an understanding of the foundations of physical geography, with an emphasis on weather and climate systems. Students will learn how interconnections among the four realms drive variation in weather, climate, and biodiversity around the globe and through time. Variation in landforms and ecosystems are the focus of GEOG 1402. Collectively, GEOG 1401 and 1402 will allow students to better appreciate the environment around them, and to critically evaluate the implications of changes on the physical, natural environment.

In labs, students will work collaboratively in teams to apply scientific knowledge related to the course content that address pressing environmental challenges related to flood and water quality management, solar energy use, species conservation, and other applied environmental issues.

Upon completion of this course, students will:

- Recognize the complex biophysical processes and energy flows that underlie global and local patterns in weather, climate, and biota
- Explain the drivers of recent and past climate change, and its implications for biodiversity and species distributions
- Gain practical experience sampling, measuring, and analyzing climatological and biophysical systems
- Develop research questions and apply the scientific method to generate new knowledge to address environmental challenges

Textbook:

Strahler, A. and O.W. Archibold (2011). Physical Geography-Science and Systems of the Human Environment. 5th Canadian Edition. John Wiley & Sons Canada, Ltd. ISBN: 978-0-470-67885-5

List of Topics:

1. Latitude, Longitude, Seasons (Textbook Ch. 1 & 2)
2. Atmospheric basics, energy (Textbook Ch. 3 & 4)
3. Water in the atmosphere (Textbook Ch. 6)
4. Air pressure (Textbook Ch. 5)
5. Atmospheric and ocean circulation (Textbook Ch. 5)
6. Local & regional winds; Extreme weather (Textbook Ch. 5, 6, &7)
7. Hurricanes & climate (Textbook Ch. 8, 9, & 10)
8. Past and present climate change (Textbook Ch. 10)
9. Biogeography (Textbook p.537 – 542)
10. Terrestrial biomes (Textbook p.549–551, 572-578)
11. Species range, limits, distribution (Textbook p.519-529, 535-539)
12. Adaptation and convergence; Biogeographical rules and clines (Textbook p.533-535, p.572-575)

Instruction/Course Format:

1. Planned frequency of offering and number of sections anticipated; e.g. every year, alternate years, etc.

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

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

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

5. In the absence of scheduled contact hours, please indicate how the course design encourages student engagement and supports students in achieving the learning objectives. Offer methods of teaching that take into account a diversity of student needs, learning styles and differing abilities.

6. Please describe the type of experiential education (blending theory and course work with concrete experience) and/or eLearning (using technology to support the students interaction with and access to the content, learning activities, with other students, and with faculty members in order to develop knowledge and skills) you will be using. If you are not using experiential education and/or eLearning, please explain why.

This course will be offered every year. We anticipate offering one lecture section and eight to ten lab sections.

Profs. Drezner, Korosi, Remmel, and Thienpont are competent to teach this course. In the coming year, the course will likely be taught by Prof. Drezner.

Contact hours:

- Two hours of lectures per week
- Three hours of labs per week

Experiential education:
Students will complete a series of labs that relate course content to real world challenges. Students will work in teams to generate scientific knowledge to address applied issues such as urban planning, agricultural management, climate change adaptation, long-range and transboundary transport of pollutants, and species and habitat conservation.

eLearning:
This course uses eClass as a platform for making course materials available to students

Evaluation:

Please provide a detailed description of the basis of evaluation for the proposed course, including the type and percentage value of each assignment.

If the course is to be integrated, the additional requirements for graduate students must also be provided.

If the proposed course is amenable to technologically mediated forms of delivery, please identify how the integrity of learning evaluation will be maintained (e.g. will "on-site" examinations be required, etc.) Specifically, please clearly indicate how the course will be organized for remote teaching: will be teaching synchronously and/or asynchronously?

Offer ways of evaluation that take into account a diversity of student needs, learning styles and differing abilities.

Tests:

- Three tests worth 20% each (60% total)
- The tests are not cumulative. They will be based on lecture material and the assigned readings, with most material coming from lecture. The tests do not include lab material.
- Tests will all be multiple choice and may include true and false and/or diagram-type questions.

Labs:

- Four labs worth 40% (4x10%)
- Lab assignments incorporate written and oral communication, practical lab skills, critical thinking, teamwork, and participation

Bibliography:

A library support statement is required from the bibliographer responsible for the relevant discipline to indicate whether resources are adequate to support the course.

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc. Include resources that represent diverse voices and cultural histories. If applicable, please distinguish required readings from suggested readings. *As well, please list any online resources*, and whether students will require internet access.

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

Textbook:

Strahler, A. and O.W. Archibold (2011). Physical Geography-Science and Systems of the Human Environment. 5th Canadian Edition. John Wiley & Sons Canada, Ltd. ISBN: 978-0-470-67885-5

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. As well, please indicate if any other resources are required.

This committee will not approve a course unless it is satisfied that adequate resources are available to support it.

The Physical Geography undergraduate program has three technicians (a lab technician, a field technician, and a GIS technician), a computer lab, the Aquatic Biogeochemistry lab, and field sampling equipment that can support the lab component of this course.

Course Rationale:

The following points should be addressed in the rationale:

1. Identify which degree program(s) the course contributes to (i.e., EAJ, SEM, GG, US, ES); and how the course contributes to the **learning outcomes** of the degree program(s).

2. How does the course contribute to the Faculty's social justice orientation and equity commitment?

3. Comment on the relationship of the proposed course to other existing offerings, particularly in terms of overlap in learning outcomes and/or content. If overlap exists, please indicate the nature and extent of consultation that has taken place. If the proposed course is to be cross-listed, integrated or listed as an equivalent/exclusion with another course, approval is required from all of the relevant Faculties/units.

4. If applicable, please indicate the relationship of the proposed course to interdisciplinary programs; i.e. for which interdisciplinary program(s) will the course count for major/minor credit. As well, please indicate the nature and extent of consultation that has taken place with the relevant interdisciplinary program coordinator(s).

5. The expected enrolment in the course.

This course is a General Education science credit for the EAJ, SEM, and GG degree programs, and a program core requirement for the BSc in Environmental Science. For the BSc in Environmental Science, the course specifically addresses the following Program Learning Outcomes:

- Recognize the complex biophysical processes that explain patterns in landforms, ecosystems, and climate in space and time and assess their implications
- Describe, synthesize, and evaluate the causes and impacts of environmental change and biodiversity loss
- Work collaboratively across disciplines to address scientific and policy solutions to environmental challenges
- Effectively communicate concepts, arguments, analyses, and data for diverse audiences in multiple forms
- Develop questions about the environment into scientifically testable hypotheses and design studies that implement the scientific method
- Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, analyzing, and interpreting interactions among climatological, ecological, and biophysical systems in both the field and laboratory

Social justice and equity:
In this course, students will learn about the biophysical processes that explain global and regional vulnerability to climate change, extreme weather and natural disasters, and biodiversity loss. Students will directly engage with these issues in labs that focus on topical issues related to climate, weather, pollution, and loss of biodiversity.

Relationship to existing offerings:
No overlap exists with other courses. This course proposal is paired with a new course proposal for GEOG 1402 3.0 Physical Geography: The Dynamic Earth. Collectively, GEOG 1401 and 1402 will replace GEOG 1400 6.0: Physical Geography, converting a 6.0 credit course into two stand-alone 3.0 credit options.

The course is to be cross-listed with the Faculty of Science (as EU/SC GEOG 1401)

Expected enrollment in the course is 200-300 students

Confirmation of Consultation/Approval:

If the proposed course is to be cross-listed, integrated, listed as an equivalent/exclusion with another course, or listed as a major/minor course option in an interdisciplinary program, approval from all of the relevant parties is also required. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

July 2020

faculty of environmental and urban change

undergraduate curriculum subcommittee

NEW COURSE PROPOSAL FORM

Date of Submission:	Sept. 3, 2020	**Effective Session:**	Winter 2021
Faculty: Please indicate all relevant Faculties.	Environmental and Urban Change	**Responsible Unit and Course Rubric:**	GEOG
Course Number: Special Topics courses *Include variance (e.g. ENVS 3800C 3.0 or GEOG 3800C 3.0, Variance is "C")*	1402	**Academic Credit Value:** For example, 3.0, 6.0, 9.0. Indicate both the fee and MET weight if different from the academic weight.	3.0
Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Course Repository.	Physical Geography: The Dynamic Earth		
Short Course Title: **Maximum 40 characters**, including punctuation and spaces.	The Dynamic Earth		

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

YORK UNIVERSITÉ UNIVERSITY

Brief Course Description:

No more than 40 to 60 words.

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. For editorial consistency, verbs should be in the present tense.

If applicable, include information regarding the language of instruction (if other than English), prerequisites and co-requisites, course equivalents/ exclusions, and other course notes.

The Earth is constantly changing. Examine the natural processes occurring at the Earth's surface that provide the physical setting for human activities. Learn how interconnections among land, water, air, and living things drive variation in landforms, ecosystems, and biodiversity around the globe and through geologic time.

Expanded Course Description:

This is the detailed course description, **including LEARNING OUTCOMES, topics/theories, learning objectives**, **a detailed list of week by week readings**, as it will appear in supplemental calendars.

Consider how the course responds to a diverse student population in its content, teaching methods and modes of assessment. Consider how the course meets the social justice orientation and equity commitment of the Faculty in encouraging students to examine various environments as shaped by race, class, disability, gender, gender-identity, sexuality and other axes of oppression.

The Earth is constantly changing. Many of these are natural. More recently, humankind has imposed several new challenges for the planet and its inhabitants. Physical geography examines the natural processes occurring at the Earth's surface that provide the physical setting for human activities.

The total Earth system is divided into realms. The systems that operate within the realms of the lithosphere, hydrosphere, and biosphere are the focus of the course. Some systems occur at very small scales like that of an individual plant while others occur at very large scales encompassing the entire planet. Most systems do not operate independently but rather interact with several others.

A major objective of this introductory course is to provide students with an understanding of the foundations of physical geography, with an emphasis on landforms, soils, and biota. This will allow students to better appreciate the environment around them, and to critically evaluate the implications of changes on the physical, natural environment.

In labs, students will work collaboratively in teams to apply scientific knowledge related to the course content to address pressing environmental challenges with social, policy, management, health, or other implications.

Upon completion of this course, students will:

- Be able to explain how changes in the Earth`s land surfaces over time have influenced modern landforms and the past and current distribution of species.
- Outline the role geophysical processes play in driving environmental hazards that influence human activities and well-being
- Gain practical experience observing, sampling, measuring, and analyzing geophysical systems.
- Develop research questions and apply the scientific method to generate new knowledge to address environmental challenges

Textbook:

Strahler, A. and O.W. Archibold (2011). Physical Geography-Science and Systems of the Human Environment. 5th Canadian Edition. John Wiley & Sons Canada, Ltd. ISBN: 978-0-470-67885-5

List of Topics:

1. Rock families and the rock cycle (Textbook Ch. 11)
2. Plate tectonics (Textbook Ch. 12)
3. Volcanic and tectonic landforms (Textbook Ch. 13)

4. Weathering and mass wasting (Textbook Ch. 14)
5. Inland waters and fluvial geomorphology (Textbook Ch. 15 & 16)
6. Wind, waves, and coastal environments (Textbook Ch. 17)
7. Glacial landscapes and dynamics (Textbook Ch. 18)
8. Soil Systems (Textbook Ch. 19)
9. Historical biogeography (Textbook p. 533-539)
10. Evolution, natural selection and extinction (Textbook p. 533-534)
11. Islands and systems in isolation (Textbook p. 545 – 547)
12. Disturbance and succession (Textbook p. 526 – 533)

Instruction/Course Format:

1. Planned frequency of offering and number of sections anticipated; e.g. every year, alternate years, etc.

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

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

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

5. In the absence of scheduled contact hours, please indicate how the course design encourages student engagement and supports students in achieving the learning objectives. Offer methods of teaching that take into account a diversity of student needs, learning styles and differing abilities.

6. Please describe the type of experiential education (blending theory and course work with concrete experience) and/or eLearning (using technology to support the students interaction with and access to the content, learning activities, with other students, and with faculty members in order to develop knowledge and skills) you will be using. If you are not using experiential education and/or eLearning, please explain why.

This course will be offered every year. We anticipate offering one lecture section and eight to ten lab sections.

As a first year introductory course, all faculty in physical geography (currently this includes Profs. Bello, Drezner, Korosi, Remmel, Thienpont, and Young) are competent to teach this course. In the coming year, the course will likely be taught by Prof. Thienpont.

Contact hours:

- Two hours of lectures per week
- Three hours of labs per week

Experiential education:

Students will complete a series of labs in this course that relate course content to real world challenges. Students will work in teams to generate scientific knowledge to address applied issues such as coastal erosion, flooding, geohazards, ecosystem restoration, and the global biodiversity crisis.

eLearning:

This course uses eClass as a platform for making course materials available to students.

Evaluation:

Please provide a detailed description of the basis of evaluation for the proposed course, including the type and percentage value of each assignment.

If the course is to be integrated, the additional requirements for graduate students must also be provided.

If the proposed course is amenable to technologically mediated forms of delivery, please identify how the integrity of learning evaluation will be maintained (e.g. will "on-site" examinations be required, etc.) Specifically, please clearly indicate how the course will be organized for remote teaching: will be teaching synchronously and/or asynchronously?

Offer ways of evaluation that take into account a diversity of student needs, learning styles and differing abilities.

Tests:

- Three tests worth 20% each (60% total)
- The tests are not cumulative. They will be based on lecture material and the assigned readings, with most material coming from lecture. The exams do not include lab material.
- Tests will all be multiple choice and may include true and false and/or diagram-type questions.

Labs:

- Four labs worth 40% (4x10%)
- Lab assignments incorporate written and oral communication, practical lab skills, critical thinking, teamwork, and participation

Bibliography:

A library support statement is required from the bibliographer responsible for the relevant discipline to indicate whether resources are adequate to support the course.

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc. Include resources that represent diverse voices and cultural histories. If applicable, please distinguish required readings from suggested readings. *As well, please list any online resources*, and whether students will require internet access.

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

Textbook:

Strahler, A. and O.W. Archibold (2011). Physical Geography-Science and Systems of the Human Environment. 5th Canadian Edition. John Wiley & Sons Canada, Ltd. ISBN: 978-0-470-67885-5

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. As well, please indicate if any other resources are required.

This committee will not approve a course unless it is satisfied that adequate resources are available to support it.

The Physical Geography undergraduate program has three technicians (a lab technician, a field technician, and a GIS technician), a computer lab, the fluvial geomorphology / hydraulic flume lab, the Aquatic Biogeochemistry lab, and field sampling equipment that can support the lab component of this course.

Course Rationale:

The following points should be addressed in the rationale:

1. Identify which degree program(s) the course contributes to (i.e., EAJ, SEM, GG, US, ES); and how the course contributes to the **learning outcomes** of the degree program(s).

2. How does the course contribute to the Faculty's social justice orientation and equity commitment?

3. Comment on the relationship of the proposed course to other existing offerings, particularly in terms of overlap in learning outcomes and/or content. If overlap exists, please indicate the nature and extent of consultation that has taken place. If the proposed course is to be cross-listed, integrated or listed as an equivalent/exclusion with another course, approval is required from all of the relevant Faculties/units.

4. If applicable, please indicate the relationship of the proposed course to interdisciplinary programs; i.e. for which interdisciplinary program(s) will the course count for major/minor credit. As well, please indicate the nature and extent of consultation that has taken place with the relevant interdisciplinary program coordinator(s).

5. The expected enrolment in the course.

This course contributes to all EUC programs. It is a General Education science credit for the EAJ, SEM, and GG degree programs, and a program core requirement for the BSc in Environmental Science. For the BSc in Environmental Science, the course specifically addresses the following Program Learning Outcomes:

- Recognize the complex biophysical processes that explain patterns in landforms, ecosystems, and climate in space and time and assess their implications
- Describe, synthesize, and evaluate the causes and impacts of environmental change and biodiversity loss
- Work collaboratively across disciplines to address scientific and policy solutions to environmental challenges
- Effectively communicate concepts, arguments, analyses, and data for diverse audiences in multiple forms
- Develop questions about the environment into scientifically testable hypotheses and design studies that implement the scientific method
- Gain practical experience and develop scientific, strategic, and expert knowledge by sampling, measuring, analyzing, and interpreting interactions among climatological, ecological, and biophysical systems in both the field and laboratory

Social justice and equity:
In this course, students will learn about the biophysical processes that explain spatial variation in access to natural resources, geohazards risk, and biodiversity loss. Students will directly engage with these issues in labs that focus on topical issues related to natural disasters, flooding, and habitat restoration.

Relationship to existing offerings:
No overlap exists with other courses. This course proposal is paired with a new course proposal for GEOG 1401 3.0 Physical Geography: Weather and Climate. Collectively, GEOG 1401 and 1402 will replace GEOG 1400 6.0: Physical Geography, converting a 6.0 credit course into two stand-alone 3.0 credit options.

The course is to be cross-listed with the Faculty of Science (as EU/SC GEOG 1402)

Expected enrollment in the course is 200-300 students

Confirmation of Consultation/Approval:

If the proposed course is to be cross-listed, integrated, listed as an equivalent/exclusion with another course, or listed as a major/minor course option in an interdisciplinary program, approval from all of the relevant parties is also required. Please ensure that all of the relevant signatures are included below, or that appropriate consultation/approval documentation is attached.

Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature
Faculty/Unit/Program	Signature

July 2020

Non-Major Modification Program Changes

1. Programs:
   Chemistry

2. Degree Designation:
   BSc Chemistry
   Honours Major BSc Chemistry
   Specialized Honours BSc Chemistry
   Specialized Honours BSc Chemistry – Pharmaceutical & Biological Stream

3. Type of Modification: update of core requirements

4. Effective Date: FW21

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5. State what the changes are

   Addition of a new course to the core requirements.

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

   This new requirement should enhance students' ability to meet existing program learning outcomes sooner and to a greater level, and better prepare them for later required courses. It will also enable instructors in those later courses to spend more time meeting the chemistry-oriented objectives without needing to spend time to build up students' mathematical base.

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

   No change in mapping

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

   No impact on other programs is intended nor anticipated. Given the mathematical nature of the material covered in the new course SC/CHEM 2000 3.0, the Department of Mathematics and Statistics was consulted about the content but not about impacts on other programs.

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

   none

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

accommodated.

The changes are intended to take effect in Fall 2021. Current students in Chemistry (or those currently in Biochemistry transferring into Chemistry) will not be required to meet the new degree requirement.

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

(see next page)

Chemistry

Change from

Program Core

The program core is defined as (~~28~~ credits): SC/CHEM 1000 3.00; SC/CHEM 1001 3.00; SC/CHEM 2011 3.00; SC/CHEM 2020 3.00 and SC/CHEM 2021 3.00; SC/CHEM 2030 3.00; SC/CHEM 2080 4.00; SC/CHEM 3000 3.00; SC/CHEM 3001 3.00.

[…]

Bachelor Program

[…]

B. Major requirements:

- the program core, as specified above (~~28~~ credits);
- […]

[…]

Honours Programs

SPECIALIZED HONOURS PROGRAM

[…]

B. Major requirements:

- the program core, as specified above (~~28~~ credits);
- […]

[…]

SPECIALIZED HONOURS PROGRAM STREAM IN PHARMACEUTICAL AND BIOLOGICAL CHEMISTRY

[…]

B. Major requirements:

- the program core, as specified above (~~28~~ credits);
- […]

[…]

Change to

Program Core

The program core is defined as (**31** credits): SC/CHEM 1000 3.00; SC/CHEM 1001 3.00; **SC/CHEM 2000 3.00;** SC/CHEM 2011 3.00; SC/CHEM 2020 3.00 and SC/CHEM 2021 3.00; SC/CHEM 2030 3.00; SC/CHEM 2080 4.00; SC/CHEM 3000 3.00; SC/CHEM 3001 3.00.

[…]

Bachelor Program

[…]

B. Major requirements:

- the program core, as specified above (**31** credits);
- […]

[…]

Honours Programs

SPECIALIZED HONOURS PROGRAM

[…]

B. Major requirements:

- the program core, as specified above (**31** credits);
- […]

[…]

SPECIALIZED HONOURS PROGRAM STREAM IN PHARMACEUTICAL AND BIOLOGICAL CHEMISTRY

[…]

B. Major requirements:

- the program core, as specified above (**31** credits);
- […]

[…]

HONOURS MAJOR PROGRAM

[…]

B. Major requirements:

- the program core, as specified above (~~28~~ credits);
- […]

[…]

HONOURS MAJOR PROGRAM

[…]

B. Major requirements:

- the program core, as specified above (**31** credits);
- […]

[…]

Changes to Existing Course

Faculty:

Department: Mathematics and Statistics

Date of Submission:

Course Number: MATH 4012

Effective Session: 2020-2021

Course Title: Analysis IV

Type of Change:

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

Change From:	**To:**
Title: Analysis IV Course description: Lesesgue measure and integration on the real line, Hilbert space, Lp spaces, Fourier analysis Prerequistes: SC/MATH 4011	Title: Lebesgue Measure Theory Course description: Cardinality, Axiom of Choice, Zorn's Lemma, Lebesgue measure and integration on the real line, completeness of L2 and relation to Fourier series, convergence in measure, absolutely continuous function, Fundamental Theorem of Calculus, Fubini's Theorem Prerequistes: SC/MATH 3001

Rationale:

Recently changes were implemented to the analysis program due to low enrollments in SC/MATH 4001 6.00. MATH 3001 was refocused and SC/MATH 4001 6.00 was split into two courses, SC/MATH 4011 3.00 and SC/MATH 4012 3.00. Since the split, enrolments in MATH 4011 have substantially exceeded those in MATH 4001, making the fourth-year analysis stream viable. But MATH 4012 has yet to be offered with MATH 4011 as a prerequisite.

The purpose of this proposal is to further update the fourth-year analysis courses in order to give students more access to courses at the fourth year level. Rather than have a fixed ordering in which MATH 4011 is prerequisite to MATH 4012, the courses are being reorganized to be independent of one another, allowing students to choose one or both, according to whatever best suits their program needs and personal interest.

In order not to add an additional teaching load to our program, we propose that MATH 4011 be offered in the fall semester of odd-numbered calendar years and MATH 4012 be offered in the fall semester of even-numbered calendar years. This should also help preserve or even enhance enrollments in these courses in a given calendar year as many students will desire to take both. This format is viable as students can take MATH 3001 in the winter semester of their second year to ensure they have the opportunity to take which fourth-year course they desire in either third or fourth year. The PMATH major requirements will need to be changed from requiring MATH 4011 to requiring MATH 4011 or MATH 4012. As MATH 4011 and MATH 4012 will be of equal difficulty, it is not a reduction in program quality nor will one course be favoured over the other.

The specific changes to MATH 4012 are as follows. First a title change is in order as Analysis III and Analysis IV are not appropriate titles for MATH 4011 and MATH 4012 respectively following these changes. The prerequistes of MATH 4012 will be changed to just MATH 3001 as it will be run independently from MATH 4011. The course description has changed to include some of the extensive material listed in MATH 4011 and to reflect what the course is about.

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.

Proposed Changes to the Specialized Honours, Honours Majors and Bachelors (BA and BSc) Requirements of the Pure Math Program in the Academic Calendar

Rationale:

- SC/MATH 4001 6.00 was split into two courses; SC/MATH 4011 3.00 and SC/MATH 4012 3.00 due to low enrolments. Enrolments in MATH 4011 have substantially exceeded those being observed in MATH 4001 since the changes making the fourth-year analysis stream viable whereas MATH 4012 has yet to be offered as MATH 4011 is listed as a prerequisite.
- A proposed change is in the works to make MATH 4011 and MATH 4012 independent courses whose offerings alternate in order to give students the choice of picking the analysis course of their interest, or picking both. Thus as only one of these courses will be offered each year, a change to the degree requirements needs to be made: instead of requiring MATH 4011, we will only require MATH 4011 or MATH 4012. As these courses are of equal difficulty, this does not decrease the difficulty of the degree.

Change from	Changes	Change to
Specialized Honours BA Program • LE/EECS 1560 3.00; • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00; SC/MATH 4021 3.00; • at least six additional credits in mathematics courses without second digit 5 at the 4000 level; • at least 15 additional credits in mathematics courses without second digit 5 for a total of at least 66 credits from major mathematics; • additional elective credits, as required for an overall total of at least 120 credits, of which at least 36 credits are at the 3000	**Specialized Honours BA Program** • LE/EECS 1560 3.00; • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • ~~SC/MATH 4011 3.00~~ SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional credits in mathematics courses without second digit 5 at the 4000 level; • at least 15 additional credits in mathematics courses without second digit 5 for a total of at least 66 credits from major mathematics; • additional elective credits, as required for an overall total of at	**Specialized Honours BA Program** • LE/EECS 1560 3.00; • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional credits in mathematics courses without second digit 5 at the 4000 level; • at least 15 additional credits in mathematics courses without second digit 5 for a total of at least 66 credits from major mathematics; • additional elective credits, as required for an overall total of at least 120 credits, of

level or higher, at least 18 of which must be at the 4000 level.	least 120 credits, of which at least 36 credits are at the 3000 level or higher, at least 18 of which must be at the 4000 level.	which at least 36 credits are at the 3000 level or higher, at least 18 of which must be at the 4000 level.
Honours BA Program • LE/EECS 1560 3.00; • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; • SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00; SC/MATH 4021 3.00; • at least six additional credits in mathematics courses without second digit 5 at the 4000 level for a total of 51 credits from major mathematics courses; • additional elective credits, as required for an overall total of at least 120 credits, of which at least 36 credits are at the 3000 level or higher, at least 18 of which must be at the 4000 level.	**Honours BA Program** • LE/EECS 1560 3.00; • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; • SC/MATH 3021 3.00; SC/MATH 3022 3.00; • ~~SC/MATH 4011 3.00~~ SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional credits in mathematics courses without second digit 5 at the 4000 level for a total of 51 credits from major mathematics courses; • additional elective credits, as required for an overall total of at least 120 credits, of which at least 36 credits are at the 3000 level or higher, at least 18 of which must be at the 4000 level.	**Honours BA Program** • LE/EECS 1560 3.00; • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; • SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional credits in mathematics courses without second digit 5 at the 4000 level for a total of 51 credits from major mathematics courses; • additional elective credits, as required for an overall total of at least 120 credits, of which at least 36 credits are at the 3000 level or higher, at least 18 of which must be at the 4000 level.
Specialized Honours BSc Program B. Major requirements: • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00;	**Specialized Honours BSc Program** B. Major requirements: • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00;	**Specialized Honours BSc Program** B. Major requirements: • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00;

SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00; SC/MATH 4021 3.00; • at least six additional credits from major mathematics courses at the 4000 level; • at least 15 additional credits from major (i.e. without second digit 5) mathematics courses, or approved or equivalent courses, for a total of at least 66 credits from major mathematics courses;	SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • ~~SC/MATH 4011 3.00~~ SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional credits from major mathematics courses at the 4000 level; • at least 15 additional credits from major (i.e. without second digit 5) mathematics courses, or approved or equivalent courses, for a total of at least 66 credits from major mathematics courses;	SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional credits from major mathematics courses at the 4000 level; • at least 15 additional credits from major (i.e. without second digit 5) mathematics courses, or approved or equivalent courses, for a total of at least 66 credits from major mathematics courses;
Honours BSc Major B. Major requirements: • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00; SC/MATH 4021 3.00; • at least six additional major (i.e. without second digit 5) mathematics credits at the 4000 level, for a total of at least 51 credits from major mathematics courses. • the course requirements for the second major or the minor.	**Honours BSc Major** B. Major requirements: • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • ~~SC/MATH 4011 3.00~~ SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional major (i.e. without second digit 5) mathematics credits at the 4000 level, for a total of at least 51 credits from major mathematics courses. • the course requirements for the second major or the	**Honours BSc Major** B. Major requirements: • the mathematics/statistics core (24 credits); • SC/MATH 2001 3.00; • SC/MATH 3001 3.00; SC/MATH 3010 3.00; SC/MATH 3021 3.00; SC/MATH 3022 3.00; • SC/MATH 4011 3.00 or SC/MATH 4012 3.00; SC/MATH 4021 3.00; • at least six additional major (i.e. without second digit 5) mathematics credits at the 4000 level, for a total of at least 51 credits from major mathematics courses. • the course requirements for the second major or the minor.

	minor.	

Changes to Existing Course

Faculty:

Department: Mathematics & Statistics

Date of Submission:

Course Number: SC/MATH 3001 3.00

Effective Session: 2020-2021

Course Title: Real Analysis II

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

Change From:	To:
Numerical series, Riemann integration, Taylor polynomials, sequences and series of functions, uniform convergence, power series, introduction to metric spaces including compactness and completeness, Weierstrass Approximation Theorem. Continues MATH 2001. Proof-based, intended for Honours students in Mathematics. Prerequisites: SC/ MATH 2001 3.00; SC/MATH 1310 3.00 or ISCI 1401 3.00 or ISCI1410 6.00. Course credit exclusion: GL/MATH 3320 3.00, GL/MATH 4240 6.00.	Sequences and series of functions, uniform convergence, complex exponential. Cesaro convergence, convolution kernels, Weierstrass approximation. Inner product spaces, L2 convergence, pathologies of pointwise convergence. Applications: isoperimetric inequality, Weyl equidistribution, exotic functions. Fourier transform on the line. Continues MATH 2001. Proof-based. Prerequisites: SC/ MATH 2001 3.00; SC/MATH 1310 3.00 or ISCI 1401 3.00 or ISCI1410 6.00. Course credit exclusion: GL/MATH 3320 3.00, GL/MATH 4240 6.00.

Rationale:

This is part of a revision of the analysis sequence within the honours BSc pure mathematics stream. Real Anlaysis II is being modified from an abstract introduction to metric space and calculus on Euclidean space, to a rigorous introduction to Fourier analysis. The objectives are to create a course with broader appeal, including to students in Applied Mathematics or Physics, and with a wider range of applicability within mathematics and statistics as well as to the applied sciences. The intention is to create a course that is more interesting to students, that serves as a stepping stone to a wider array of subsequent courses, and that has higher enrolment than earlier incarnations. Within the revised analysis sequence, the updated version of Real Analysis II will provide a foundation for, and lead naturally into, either of Analysis III or Analysis IV.

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.