FACULTY OF SCIENCE
MEETING OF FACULTY
Thursday, May 22, 2014, 3:00 to 4:00 p.m.
Leacock Council Room (232)

A G E N D A

1. Adoption of Agenda

2. Reports of Committees
   a) Faculty of Science Excellence Award – Prof. Richard Koestner, Chair
   b) Leo Yaffe Teach Award – Prof. Edith Zorychta, Chair

3. Candidates for Degrees
   - Director (Advising Services) Nicole Allard
   a) Bachelor of Arts and Science **S-13-24 To be Tabled**
   b) Bachelor of Science **S-13-25 To be Tabled**
   c) Diploma in Environment **S-13-26 To be Tabled**
   d) Diploma in Meteorology **S-13-27 To be Tabled**

4. Minutes of March 18, 2014 **S-13-23 On Web**

5. Business Arising from the Minutes

6. Reports of Committees (continued)
   c) Committee on Student Standing – Director Nicole Allard **S-13-28 To be Tabled**
   d) Scholarships Committee – Associate Dean Victoria Kaspi **S-13-29 To be Tabled**
   e) Academic Committee – Associate Dean Laurie Hendren **S-13-30 On Web**

7. Dean's Business
   (a) Dean's Multidisciplinary Undergraduate Research List **S-13-31 To be Tabled**
   - Director Nicole Allard
   (b) Faculty of Science Academic Mission-Associate Dean Laurie Hendren **S-13-32 On Web**
   (c) Trottier Institute for Science and Public Policy **S-13-33 On Web**
   (d) Announcements

8. Results of Science Election for Senate **S-13-34 On Web**

9. Reports on Actions of Senate
   - Prof. Timothy Moore: Senate Meeting of March 19, 2014
   - Prof. David Zuroff: Senate Meeting of April 23, 2014
   - Prof. Graham Bell: Senate Meeting of May 14, 2014

10. Members' Question Period

11. Other Business

FACULTY OF SCIENCE
Meeting of Faculty
Tuesday, March 18, 2014
Leacock Council Room – L232

ATTENDANCE: As recorded in the Faculty Appendix Book.

DOCUMENTS: **S-13-21, S-13-22**

In the temporary absence of Dean Grant, Associate Dean Hendren called the meeting to order at 3:00 p.m.

(1) ADOPTION OF AGENDA

Prof. Grütter **moved**, seconded by Prof. Mucci, that the Agenda be adopted.

The motion carried.

(2) PRESENTATION: RESEARCH PERFORMANCE & INTERNATIONAL STRATEGY

702.1 Vice-Principal (Research & International Relations) Rosie Goldstein highlighted key points of her presentation on research performance and international strategy, which is available on the Web at

http://www.mcgill.ca/science/about/administration/docs-agenda-faculty/2013-2014/march-18-2014

V.-P. Goldstein said she would be pleased to answer members' questions.

702.2 Associate Dean Hendren asked whether the Research Intensity measure (research funding per eligible researcher) was normalized to take account of different levels of funding for researchers in different fields. V.-P. Goldstein said that it was not. In reply to another question from Associate Dean Hendren, V.-P. Goldstein said that her office was working to attempt to increase the amount of funding for pure research (as opposed to contract work).

702.3 In response to a member who said that a major problem related to research funding was McGill's shortage of space, and that this had had a negative impact relating to potential Regroupements Stratégiques funding, V.-P. Goldstein said that although space was a perennial problem at McGill, her office would work creatively to attempt to provide support for any space-related issues.

702.4 In reply to a member, V.-P. Goldstein said that McGill could improve its flexibility in dealing with commercial companies to increase opportunities for collaboration.

702.5 Dean Grant said, in relation to Associate Dean Hendren's point, that while it was important to measure funding levels for research, and to attempt to increase funding levels, it was also important to keep a critical eye on the type of research that would be done and its worth.

Dean Grant thanked V.-P. Goldstein for her presentation to the Faculty of Science and for her responses to questions.

(3) **MINUTES OF FEBRUARY 18, 2014**

Ms. Toccalino **moved**, seconded by Prof. Mucci, that the Minutes be approved.

The motion carried.

(4) **BUSINESS ARISING FROM THE MINUTES**

There was no business arising from the Minutes.

(5) **REPORTS OF COMMITTEES**

a) **Academic Committee** **S-13-22**

The Academic Committee approved the following on Tuesday, February 25, 2014:

(1) **Biology**

- New Course

BIOL 580	Genet Approaches to Neur Syst 3 credits	**AC-13-79**

705.1 Associate Dean Hendren said that the course will expand neurobiology offerings for both graduate and senior undergraduate students.

705.2 This course will be added as a Complementary course to the following programs:
- B.Sc. Major and Honours Programs in Neuroscience
- B.Sc. Major in Biology and Mathematics (Neurosciences Stream)

Associate Dean Hendren **moved,** seconded by Prof. Western, that the new course be adopted.

The motion carried.

- New Course

BIOL 598	Advanced Design and Statistics 3 credits	**AC-13-80**

705.3 BIOL 598 will merge BIOL 596 (Advanced Experimental Design: 1 credit) and 597 (Advanced Biostatistic: 2 credits) into a single 3-credit course.

Associate Dean Hendren **moved,** seconded by Prof. Western, that the new course be adopted.

The motion carried.

- Course Changes

BIOL 342	Contemp Topics in Aquatic Ecol Title, Description 3 credits	**AC-13-81**

705.4 Associate Dean Hendren said that the changes to BIOL 342 add topics in freshwater biology and ecology to the previously existing marine topics.

Associate Dean Hendren **moved,** seconded by Prof. Western, that the new course be adopted.

The motion carried.

Program Changes:
- Major in Biology **AC-13-82**

705.5 The changes clarify the minimum and maximum number of credits, rearrange Required and Complementary course lists for greater clarity, and specify that 6 Complementary credits at the 400-level or above are required.

Associate Dean Hendren **moved,** seconded by Prof. Western, that the changes be approved.

The motion carried.

Associate Dean Hendren thanked the Department of Biology for the work involved in clarifying the program.

(2) Physiology
- Honours in Physiology **AC-13-26**
- Major in Physiology **AC-13-27**
- Liberal - Core Science Component in Physiology **AC-13-28**

705.6 In reply to a student concerning the lack of the specific inclusion of CHEM 302 in the Major and Honours Programs in Physiology, Dean Grant said that the issue would be looked into.

Associate Dean Hendren **moved,** seconded by Prof. Hurtubise, that the above changes be approved.

The motion carried.

Associate Dean Hendren thanked the Department of Physiology for the work done in revising the programs, and for obtaining the many consultation reports from relevant units.

Secretary's Note: CHEM 302 will not be specifically listed in the Major and Honours Programs in Physiology, but Major students can take it under the Upper-Level Science Courses umbrella. The reason for not specifically listing CHEM 302 is that the course is subscribed to near capacity.

(3) Mathematics & Statistics
Proposed Changes to the Undergraduate Analysis Courses **AC-13-63**
- New Course
MATH 254 Honours Analysis 1 **AC-13-64**
3 credits

705.7 Associate Dean Hendren said that owing to the increased enrolment in MATH 242, Analysis 1, the new course MATH 254 was being created especially for Honours students.

Associate Dean Hendren **moved**, seconded by Prof. Hurtubise, that the course be adopted.

The motion carried.

- Course Changes

MATH 242	Analysis 1 Restrictions 3 credits	**AC-13-65**
MATH 243	Analysis 2 Description 3 credits	**AC-13-66**
MATH 255	Honours Analysis 2 Prerequisites, Description 3 credits	**AC-13-67**
MATH 354	Honours Analysis 3 Description 3 credits	**AC-13-68**
MATH 355	Honours Analysis 4 Description 3 credits	**AC-13-69**

705.8 The restriction change for MATH 242 reflects the creation of MATH 254. The changes in the other four courses reflect current teaching practices.

Associate Dean Hendren **moved**, seconded by Prof. Hurtubise, that the above course changes be approved.

The motion carried.

MATH 356	Honours Probability Prerequisites, Corequisites 3 credits	**AC-13-70**

705.9 The changes will allow students more flexibility in courses.

Associate Dean Hendren **moved**, seconded by Prof. Hurtubise, that the course changes be approved.

The motion carried.

MATH 587	Advanced Probability Theory 1 Prerequisites 4 credits	**AC-13-71**

705.10 Associate Dean Hendren explained the reasons for the prerequisite changes.

Associate Dean Hendren **moved**, seconded by Prof. Hurtubise, that the course changes be approved.

The motion carried.

B.Sc. Program Changes:

- Honours in Applied Mathematics **AC-13-73**
- Honours in Mathematics **AC-13-74**

705.11 Allowing students to choose either MATH 242, Analysis 1, or MATH 254, Honours Analysis 1, makes a transfer between Major and Honours programs simple.

Associate Dean Hendren **moved**, seconded by Prof. Hurtubise, that the above changes be approved.

The motion carried.

- Honours in Mathematics & Physics **AC-13-75**

705.12 As above, the choice of MATH 242 or MATH 254 allows for a simple transfer between Major and Honours programs.

Associate Dean Hendren **moved**, seconded by Prof. Grütter, that the changes be approved.

The motion carried.

Proposed Changes to the Undergraduate Honours Program in Probability and Statistics **AC-13-72**

- Honours in Probability and Statistics **AC-13-76**

705.13 After describing the proposed changes, Associate Dean Hendren **moved**, seconded by Prof. Hurtubise, that the changes be approved.

The motion carried.

- Honours in Statistics and Computer Science **AC-13-77**
- Joint Honours in Mathematics and Computer Science **AC-13-78**

705.14 For both programs, the choice of MATH 242 or MATH 254 allows for a simple transfer between Major and Honours programs. For the Honours in Statistics and Computer Science, MATH 587 is a more appropriate course than MATH 355.

Associate Dean Hendren **moved**, seconded by Prof. Thérien, that the above changes be approved.

The motion carried.

(4) Other (For Information)

- Participation Trends In Undergraduate Research Courses **AC-13-62**

705.15 Associate Dean Hendren summarized the data in Document #AC-13-62. She said that in 2005-2006, there had been 24 students registered in the 396 undergraduate research

courses. This had climbed to 193 in 2013-2014 (not including summer). Over the last several years, around one-third of the 396 students were in U2. The Department of Human Genetics (a non-Science department) introduced a 396 course available to Science students in 2012-2013. This was enjoying a healthy enrolment. The only B.Sc. department currently without a 396 course was Pharmacology, which had recently indicated that it would create one.

705.16 Dean Grant mentioned that the Principal had been very impressed that about 50% of B.Sc. students were undertaking a research experience.

- Mathematic & Statistics B.A. Program Changes
- Honours in Probability and Statistics
- Honours in Statistics and Computer Science
- Joint Honours Component Mathematics

(6) DEAN'S BUSINESS

Report on the Tomlinson Teaching Project

706.1 Prof. David N. Harpp, Tomlinson Professor of Science Education, is currently running the Tomlinson Project in University-Level Science Education (TPULSE). Prof. Harpp said TPULSE was established by Richard Tomlinson in 2002 with an endowment of $8.5M. The endowment provides for fellowships to graduate students to give teaching workshops. This allows these students to take a course in graduate-level education, and to give a number of workshops a year encompassing about 50-60 graduate students who intend to teach.

706.2 New features over the past year were assistance for undergraduate teaching, as well as some small research grants. Prof. Harpp said that he had invited the deans of Agriculture and Environmental Sciences, Education, Engineering, Medicine and Science to solicit applications from instructors in science in their faculties who wished to have the assistance of "undergraduate peer instructors." The idea was that the academic instructors could choose 1-3 excellent students from a course they had taught the previous year, to assist them, in any way they chose, in their teaching. Forty-nine courses and 110 students participated in the project. The courses were distributed as follows:

Science/Medicine 35
Engineering 7
Agriculture and Environmental Sciences 6
Education 1

706.3 The award to the undergraduate peer instructors was $300 for about 25 hours of work.

706.4 Prof. Harpp said that results for the Winter term were not yet available, but of the 27 Fall term courses, all instructors responded to the project very favourably, and all wanted renewals for succeeding years.

706.5 Prof. Harpp said the project would definitely be repeated in the 2014-2015 academic year, and he anticipated being able to fund about 200 students. Letters from the deans would be sent to the relevant faculties.

706.6 In addition, 7 small research projects had been funded.

Dean Grant thanked Prof. Harpp for his work on the Tomlinson Project, and said that the project was in good hands.

(7) REPORT ON ACTIONS OF SENATE

Please note that the entire Minutes of Senate are available on the Web at https://www.mcgill.ca/senate/senate-2013-2014/senate-meeting-documents-2013-2014

Prof. Timothy Moore - Senate Meeting of February 19, 2014

The meeting started in an exciting manner as Senators had to run the gauntlet through students protesting about administrative changes in the Faculty of Arts. We were led by our brave, lion-hearted Dean of Science waving his Ipad like a sword.

After a memorial tribute for Emeritus Professor William H. Feindel (Medicine), the Principal commented on items such as the welcome infusion of funds to universities from the federal and provincial governments, and kudos such as the Steacie Fellowships won by Professors Abouheif in Biology and Clerk in Physics.

A question was posed by student senators on the Student Assessment Policy, in particular its application and the dependence in some courses on the final mark being based largely on the final examination (>75% of final mark). In response, Deputy Provost Dyens noted that courses "should" have more than one evaluation but, as long as the evaluation is fair and reasonable and clearly described on the course outline, one single evaluation for a course is permitted. An assessment of complaints about the application of this Policy will be presented at a later meeting.

45 minutes was devoted to an Open Discussion on 'Breaking down silos: interdisciplinary collaborations', focusing on the barriers and what the university could do to promote this. The discussion was wide-ranging and confusing, but some sort of agreement was reached on the need for shared intellectual spaces, the role of teaching and research in interdisciplinary studies, administrative support and good advising for students to ensure that the interdisciplinary studies potential could be met.

Senate was then hugely entertained by Provost Masi's latest PowerPoint update on the budget, which appeared precise but involved several approximations, driven by changing policies at the provincial level. For example, 'if you pay off your debt we shall give you money' was changed to 'if you make progress to pay off your debt we shall give you money'. The merits of loose and tight definitions of funding allocation was discussed and the 2013-14 deficit was likely to be about $10 million, give or take a few million. It was stated that McGill faculty are underpaid by any standard and raising salaries would place us only in the middle five of the top 15 universities in Canada; one could hear the disappointed sighs as Senators checked their bank accounts. Senators did not realise, though, that the new policy of paying faculty and staff every 14 days will result in an extra one quarter of a day's pay per year; that may have produced cheers.

Further mundane items were covered, such as a Report from the Academic Policy Committee, a report from the Board of Governors (notably the appointment of Michael Meighan as Chancellor from July 2014), and verbal 'status quo' reports on livestreaming and Senate composition.

Senators then dashed out in to the twilight to buy their Babcock McGill ties ready for the Olympics Hockey games.

(7) MEMBERS' QUESTION PERIOD

There were no members' questions.

(8) OTHER BUSINESS

There being no further business, the meeting adjourned at 4:10 p.m.

S-13-29

FACULTY OF SCIENCE

Report of the Committee on Scholarships
Recommendations Respecting Awards to Graduating Students – May 2014

S C H O L A R S H I P

(1) Moyse Travelling Scholarship $9,242

Feinberg/Aryeh Isaac, First Class Honours in Chemistry, Minor in Mathematics

M E D A L S

(1) Governor-General's Silver Medal

Labelle/Tristan, First Class Honours in Computer Science

(2) Logan Gold Medal (Earth & Planetary Sciences or Solid Earth Geophysics)

Spokas/ Kasparas, First Class Honours in Earth Sciences

(3) Major Hiram Mills Medals (Biological Sciences)

(a) <u>Anatomy & Cell Biology, Biochemistry, Physiology</u>

Barker/Conor, First Class Honours in Anatomy and Cell Biology

(b) <u>Biology, Microbiology & Immunology, Psychology</u>

Rushani/Florida, First Class Honours in Psychology, Minor in Mathematics

(4) Anne Molson Gold Medal (Mathematics and Natural Philosophy)

Ben Chaouch/Zied, First Class Joint Honours in Mathematics and Physics

(5) Horace Watson Medal & Prize (Physics) $1,500
For highest First Class standing in the Honours Physics Course and highest standing in the Honours Physics program.

Ben Chaouch/Zied, First Class Honours in Mathematics and Physics

P R I Z E S

(1) Anachemia Prize in Chemistry ($ 250 in May 2013)
For high academic merit in the Research Project courses.

Not awarded in 2013-2014

(**2) Robert E. Bell Prize in Physics** $1,052

For high academic standing and a marked aptitude for experimental studies in Physics.

Massarelli /Geremia Bono Piccirelli, First Class Honours in Physics

(3) Jack Blumer Prize in Science $722

Awarded by the Faculty of Science to a distinguished graduating student for outstanding academic achievement throughout the B.Sc. program. Recipients of this prize may not hold any other major Faculty of Science or University graduating student award.

Shi/Yuhao, Major in Computer Science and Biology

(4) Dean's Convocation Prize (Max. three prizes) 3 X $500

For distinguished graduating students for outstanding academic achievement throughout the B.Sc. program. Recipients of this prize may not hold any other major Faculty of Science or University graduating student award. A maximum of three prizes.

Balvardi/Saba, First Class Honours in Immunology (Interdepartmental)
Chen/Marian, Major in Anatomy & Cell Biology
Lee/Wan Jin, Major in Anatomy & Cell Biology

(5) Fantham Memorial Prize in Biology $767

For high academic merit in a zoologically oriented Biology program.

Kidney/Joseph Hirzer, Major Concentration in Biology-Organismal and Major Concentration in English- Literature

(6) Charles Fox Memorial Prize $600

For high academic standing in an Honours or Major program with Mathematics as one of the major components, and who has completed at least one year of study in that program.

Gerbelli-Gauthier/Mathilde, First Class Honours in Mathematics

(7) Gowrisankaran Prize in Mathematics and Statistics $1295

For outstanding students in their second or final year of a full-time Honours undergraduate degree program in the Faculty of Science with Mathematics as at least one component.

Martin/Olivier, First Class Honours in Mathematics

(8) David Harrigan Memorial Prize (Earth & Planetary Science) $710

To a graduate or undergraduate student with interest in geochemistry.

Wyman, Benjamin David Braun, First Class Honours in Earth Sciences

(9) J.S. Marshall Prize (Atmospheric & Oceanic Sciences) $241

To a graduating student who had demonstrated academic achievement and initiative.

Ronalds/Bryn, First Class Honours in Atmospheric Science, Minor in Environment

(10) McGill Alumnae Society Prize $150
To a distinguished graduating student for excellence and high academic standing. Preference given to women students.

Moon/Jeongyoon, Major in Neuroscience

(11) Anne Molson Prize in Chemistry $400
For high academic merit in the Honours program in Chemistry.

McMillan/Janet Rose, First Class Honours in Chemistry

(12) E.G.D. Murray Prize in Microbiology $135
For high academic merit in the Honours program.

Chang/ Yu-Han, First Class Honours in Microbiology & Immunology and Minor Concentration East Asian Language & Lit

(13) Penhallow Prize in Biology $ 400
For highest merit in Biology. Honours students in Biology will receive preference.

Coderre-Chabot/ Gabrielle, First Class Honours in Biology

(14) Clifford B. Purves Prize (Chemistry) $1066
For highest academic merit in the Chemistry Major program.

del Junco/Clara Elisabeth, Major in Chemistry

(15) Frank Rigler Prize in Ecology (Biology) $615
For a student entering or completing the final year for excellence in ecology.

Harris/Liam, Major in Biology, Minor Concentration in Political Science

(16) R.F. Robertson Award in Physical Chemistry $555
To the student with the best performance in the advanced Physical Chemistry laboratory course.

Lix/Kelsi, First Class Honours in Chemistry

(17) R.F. Robertson Prize in Chemistry $400
Highest academic merit in the Honours Chemistry program.

Feinberg/Aryeh Isaac, First Class Honours in Chemistry, Minor in Mathematics

(18) Muriel Roscoe Prize in Biology $372
For high academic merit in Biology.

Spratt/Joel Rodger, First Class Honours in Biology - Quantitative Biology

(19) Edward Rosenthall Memorial Prize in Mathematics $973
For high standing in a Mathematics program.

Leavitt/Nicholas, First Class Honours in Mathematics

(20) Anna and Robert Skomoroski Prize in Science 2 x $604
Awarded by the Faculty of Science to distinguished graduating students for outstanding academic achievement throughout the B.Sc. program. Recipients of this prize may not hold any other major Faculty of Science or University graduating student award.

Hakala/Amanda Kristiina, Major in Neuroscience
Qu/Annie, Major in Neuroscience

(21) Society of Chemical Industry Merit Awards

(a) <u>Honours Biochemistry</u>

Common/Jessica Lynn, First Class Honours in Biochemistry

(b) <u>Honours Chemistry</u>

Feinberg/ Aryeh Isaac, First Class Honours in Chemistry, Minor in Mathematics

(22) Emanuel Tavares Memorial Prize 2 x $165
Awarded to a graduating student with high standing in the Faculty of Arts or the Faculty of Science.

Kwan/Annie, Major in Neuroscience
Osso/Lindsay Alexandra, Major in Neuroscience

(23) Dr. Kathleen Terroux Prizes in Physiology 3 x $345
Three prizes awarded for outstanding overall performance and especially for high achievement in Physiology courses.

Janmey/Isabel, Major in Physiology, Minor in Concentration Social Studies of Medicine
Chen/Kuan Ting, First Class Honours in Physiology
Dietz/Connor Deryl, Major in Physiology & Physics

(24) P.R. Wallace Prize in Physics $326
For a student who has shown marked aptitude for studies in theoretical physics.

Ahunbay/Mete Seref, First Class Honours in Mathematics & Physics

(25) G. Stafford Whitby Prize in Polymer Chemistry $281

For the highest grade in the Introductory Polymer Chemistry course.

Wong/Jessica Leah, First Class Honours in Chemistry, Minor Concentration in Communication Studies, Minor Concentration English - Drama & Theatre

DEAN'S HONOUR LIST

Awarded by each faculty to a maximum of the top 10% of its graduating students. This honorary designation is based upon the cumulative academic record in the graduating faculty. The names of those awarded this citation are indicated on the list of candidates for the degree.

FACULTY OF SCIENCE

Report to Faculty of Science Meeting of May 22, 2014

The Academic Committee approved the following on Tuesday, March 25, 2014 and on Tuesday, April 29, 2014.

(1) PHARMACOLOGY & THERAPEUTICS

- New Course

PHAR 396	Pharmacology Research Project 3 credits	**AC-13-94**

(2) CHEMISTRY/ATMOSPHERIC & OCEANIC SCIENCES

- Course Changes

CHEM 519/ATOC 519	Advances in Chem of Atmosphere Changes in restrictions; renumbering **[from -419]** 3 credits	**AC-13-87/AC-13-89**

Course retirement:

CHEM 619/ATOC 619	Advanced Atmospheric Chemistry 3 credits	**AC-13-88/AC-13-90**

(3) ATMOSPHERIC & OCEANIC SCIENCES

Program Changes:

- Honours in Atmospheric Science	**AC-13-91**
- Major in Atmospheric Science	**AC-13-92**

(4) COMPUTER SCIENCE

Program Changes:

- B.Sc. Major in Computer Science	**AC-13-84**

(5) PHYSIOLOGY AND PHYSICS

Program Changes:

- Joint Major in Physiology and Physics	**AC-13-86**

(6) MATHEMATICS & STATISTICS

Program Changes:

- Ph.D. in Mathematics & Statistics (Thesis)	**AC-13-85**

(7) GEOGRAPHY

(i) Proposal to Allow B.A. & Sc. Students to Take Geography Major Concentrations in BOTH Arts and Science	**AC-13-95**
(ii) GEOG 205 Proposal to Include on List of Approved Freshman Science Courses	**AC-13-96**

New Course

Proposal Reference Number : 8608
PRN Alias : 13-14#2021
Version No : 3
Submitted By : Ms Chantal Grignon
Edited By : Ms Chantal Grignon

Display Printable PDF

	New Data
Program Affected?	N
Program Change Form Submitted?	
Subject/Course/Term	PHAR 396 • one term
Credit Weight or CEU's	3 credits
Course Activities	Schedule Type: PW - Project; Hours per week: 9 Total Hours per Week : 9 Total Number of Weeks : 13
Course Title	Official Course Title : Pharmacology Research Project Course Title in Calendar : Pharmacology Research Project
Rationale	This new course coordinated by the Department of Pharmacology is an Undergraduate Research Project course. This course will avail students to research laboratories that focus on Pharmacology. It will expand the current options available to students and thus further enhance the interdisciplinary nature of the undergraduate program in the life sciences. This course will be added to the roster of 396 series of Undergraduate Research Project courses currently available to Science students (http://www.mcgill.ca/science/research/ours/396).
Responsible Instructor	
Course Description	Independent research project with a final written report and an oral presentation.
Teaching Dept.	0253 : Pharmacology and Therapeutics
Administering Faculty/Unit	SC : Faculty of Science

Prerequisites	Completion of at least one undergraduate term with cGPA of 3.0. Web Registration Blocked? : Y Minimum Grade or Test Scores : C Prereq course or test taken at the same time? : N
Corequisites	
Restrictions	This course cannot be taken under the S/U option. Departmental permission required. Students cannot be supervised by the same instructor for two 396 Science courses. Open to students in programs offered by the Faculty of Science.
Supplementary Calendar Info	1. Note: Enrollment may be limited. Students are advised to start the application process well before the start of the term and to plan for an alternative course in the case that no suitable project is available. Individual projects may be suggested each term which may have project-specific prerequisites. Students may also approach professors to devise their own projects. Some projects may be accessible to students in other disciplines. See http://www.mcgill.ca/science/research/ours/396 for more information about available projects and application forms and procedures.
Additional Course Charges	
Campus	Downtown
Projected Enrollment	5
Requires Resources Not Currently Available	N
Explanation for Required Resources	
Required Text/Resources Sent To Library?	
Library Consulted About Availability of Resources?	
Consultation Reports Attached?	
Effective Term of Implementation	201409
File Attachments	• 396-info.pdf View
To be completed by the Faculty	

For Continuing Studies Use	

Approvals Summary

Show all comments

Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
3								Submitted to Curriculum/Academic Committee for approval Edited by: Chantal Grignon on: Apr 3 2014
2								Submitted to Curriculum/Academic Committee for approval Edited by: Chantal Grignon on: Apr 1 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Apr 1 2014

Information about “396” courses, which would apply to the proposed PHAR 396 course

The “396” courses offered by the Faculty of Science are described on the Science website at www.mcgill.ca/science/research/ours/396/, where students and professors can also find the web-based project proposal form.

These documents currently refer to the other 396 courses (ANAT 396, BIOC 396, HGEN 396, PHGY 396, etc.). PHAR 396 would be added once approved.

PDFs from the website are attached.

Description of 396 courses:

- pp. 2-3
- From http://www.mcgill.ca/science/research/ours/396

How 396 courses work:

- pp. 4-5
- From http://www.mcgill.ca/science/research/ours/396/how

Information for professors:

- pp. 6-7
- From http://www.mcgill.ca/science/research/ours/396/profs

Project proposal form:

- pp. 8-12
- From http://www.mcgill.ca/science/research/ours/396/form
- **Please note** that this is a **printout** of a **webform**. Online, some fields are drop-down menus. The form generates an email, which students or professors print, for collecting signatures and approval.

- *Victor Chisholm, Undergraduate Research Officer, victor.chisholm@mcgill.ca, 2014-04-03*

(http://www.mcgill.ca)

396 undergraduate research project courses

*If you are looking for the **project list** of current and past project offerings, please go here (https://www.mcgill.ca/science/research/ours/396/listing).*
*For **general information about 396 courses,** please continue reading this page.*

Purpose

These courses are designed to increase undergraduate research opportunities by

- **broadening the scope** of research courses,
- making them **available to more students**, and
- making the undergraduate research component **more interdisciplinary**.

What kind of courses are these? Who can take them?

396 courses:

- contain a significant research component that requires substantial independent work by students;
- feature a final report worth at least 50% of the final grade;
- are elective courses;
- can be taken outside your own department (i.e., by students whose major is outside the offering unit);
- count towards the requirements of the Dean's Multidisciplinary Undergraduate Research List (DMURL) (https://www.mcgill.ca/science/research/ours/dmurl);
- can be taken after one term of undergraduate studies; and
- are not available under the satisfactory/unsatisfactory option.

General prerequisites

- At least one term of undergraduate studies, a CGPA of at least 3.0, or permission of instructor to waive these requirements.
- Open to students in any program offered by the Faculty of Science.
- A project proposal form must be completed by the student and instructor and approved by the unit head or his/her delegate* before the start of the term.(* For NSCI 396 and COGS 396, it is the Neuroscience Program Director or the Cognitive Science Program Director, and the Interdisciplinary Programs Adviser.)
- Instructors will list project-specific prerequisites with the project description listings (https://www.mcgill.ca/science/research/ours/396/listing).
- A student may take more than one 396 course, but cannot be supervised by the same instructor for two 396 Science courses. Each 396 course must also be for a different project.

Participating departments, schools, or programs

The following departments, schools, or programs offer 396 courses. See our list of projects (https://www.mcgill.ca/science/research/ours/396/listing) currently offered.

Department, school, or program	Course number
Anatomy and Cell Biology	**ANAT 396** Undergraduate Research Project
Atmospheric and Oceanic Sciences	**ATOC 396** Undergraduate Research Project
Biochemistry	**BIOC 396** Undergraduate Research Project
Biology	**BIOL 396** Undergraduate Research Project
Chemistry	**CHEM 396** Undergraduate Research Project
Cognitive Science	**COGS 396** Undergraduate Research Project
Computer Science	**COMP 396** Undergraduate Research Project
Earth and Planetary Sciences	**EPSC 396** Undergraduate Research Project
Environment, McGill School of	**ENVR 396** Undergraduate Research Project
Geography	**GEOG 396** Undergraduate Research Project
Human Genetics *(NEW IN WINTER 2013)*	**HGEN 396** Human Genetic Research Project
Mathematics and Statistics	**MATH 396** Undergraduate Research Project
Microbiology and Immunology - **MICROBIOLOGY**	**MIMM 396** Ugrad Research Proj-Microbiol
Microbiology and Immunology - **IMMUNOLOGY**	**MIMM 397** Ugrad Research Proj - Immunol
Neuroscience	**NSCI 396** Undergraduate Research Project
Physics	**PHYS 396** Undergraduate Research Project
Physiology	**PHGY 396** Undergraduate Research Project
Psychology	**PSYC 396** Undergraduate Research Project
Redpath Museum	**REDM 396** Undergraduate Research Project

Classified as 396 (/science/category/tags/396) 396 courses (/science/category/tags/396-courses)

Updated on *Wed, 2013-08-14 12:36*

Copyright © 2014 McGill University (http://www.mcgill.ca)

(http://www.mcgill.ca)

How does it all work?

Units (department, school, program, etc.) will determine the terms in which they will offer their 396 courses and arrange to open a section for each of those terms.

Instructors will prepare project descriptions and submit them electronically to the Office for Undergraduate Research in Science (OURS). The forms (https://www.mcgill.ca/science/research/ours/396/form/) are available on the OURS website.

OURS (the Office for Undergraduate Research in Science) will maintain a page where students can view project descriptions (https://www.mcgill.ca/science/research/ours/396/listing/).

Students interested in a potential project (that has already been submitted by a professors and posted (https://www.mcgill.ca/science/research/ours/396/listing/)) will communicate with the instructor proposing the project. Instructions on how to apply are indicated on each project description.

Students interested in a new project (that is not yet posted (https://www.mcgill.ca/science/research/ours/396/listing/)) may ask their proposed supervisors to fill out a new form (https://www.mcgill.ca/science/research/ours/396/form/).

When an **instructor and student** agree upon a project, they should print, complete, and sign the form, and then submit the form to the unit head (or his/her delegate).

NOTE: Subsequent aspects of approval and registration for the course are handled by the unit offering the course.

In most cases, "unit" means an academic department (Biology, Chemistry, etc.). For NSCI 396 and COGS 396, it is the Neuroscience Program Director or the Cognitive Science Program Director, and the Interdisciplinary Programs Adviser.

The **unit head** or his/her delegate approves (or does not approve) the proposal form.

The **unit** should notify students if their projects are approved or not. For successful applicants, the unit should give the student permission to register for the course on Minerva. The unit may need to open a section on Minerva.

The **unit** should also notify OURS as each project is filled or disapproved, so that **OURS** can change the project status on the website to indicate that the project is no longer available for applicants. The unit should send approved forms with signatures to OURS (either fax 514-398-8102, or internal mail to Dawson Hall 408-A, or PDF scan + email).

This application, selection, and registration process should be completed before the beginning of the project's term.

The **instructor and any appropriate researchers** advise students throughout the term.

Some **units or instructors** may want to give introductory lectures, meetings, or lab safety instruction to groups of students enrolled in the course.

The **student** must present his/her final report to the instructor in charge of the project before the last day of classes.

The **instructor** in charge of the project is responsible for assigning a letter grade to the project, and providing feedback about the report to the student.

Each **unit** offering a 396 course must have a person responsible for submitting the grades for the course, for each term the course is offered.

Selected final reports may be submitted to OURS for possible posting on the OURS website. **OURS** will provide an appropriate form documenting permission from both the student and instructor to post the report.

Updated on *Mon, 2012-12-10 16:18*

Copyright © 2014 McGill University

(http://www.mcgill.ca)

(http://www.mcgill.ca)

For professors

On this page: What are '396' courses? What are the prerequisites? Who offers them? | Forms | Why fill out this form? | What is next? How will students apply? What do I need to do? | Questions?

What are '396' courses? What are the prerequisites? Which departments and programs offer them?

They are 3-credit, elective, undergraduate research project courses. They can be taken by students from other departments (e.g., a student majoring in Biology can take CHEM 396 with a Chemistry professor). They are not restricted to final-year students. For more details, please see the '396' introduction page (https://www.mcgill.ca/science/research/ours/396/).

Forms

This web-based research project proposal form (https://www.mcgill.ca/science/research/ours/396/form/) allows you (a McGill instructor) to offer a '396' undergraduate research project.

You may use this form to propose an "open" opportunity with a defined project, for students to apply to; or you may complete this form after having identified both the student and the project.

If you have any questions about this web-based form (or the former Word or LaTeX forms), please contact Victor Chisholm in the Office for Undergraduate Research in Science. See the bottom of this page for contact details.

Why fill out the '396' research project proposal form?

The signed research project proposal form will allow the student to seek departmental permission to register for the course.

The research project proposal form establishes what the student will work on, the grading scheme, and the project end date.

Even if you have already identified the student for this project, please fill it out and submit electronically; but take note to check off either "Already taken; no more positions available this term" or "Taken, but contact me for other possible projects this term".

Submitting the electronic form contributes to the Office for Undergraduate Research in Science's website's listing of past, present, and upcoming 396 research projects. Current students, potential applicants to McGill, and the public will *see summaries of undergraduate student research* in Science at McGill.

What is next? How will students apply? What do I need to do?

See our "How does it all work? (https://www.mcgill.ca/science/research/ours/396/how/)" page and then fill out the form (https://www.mcgill.ca/science/research/ours/396/form/).

Is funding available?

Up to and including Fall 2010-2011, the Dean of Science provides $300.00 per project to defray the cost of extra resources such as laboratory supplies or specialized software. As many projects as possible will be funded from the budget available. These funds are transferred at the end of the semester, to the supervisor's department, for eligible projects, if the signed project approval forms have been received by the Office for Undergraduate Research

in Science.

Effective 2010-2011, this funding is no longer available.

Questions?

Victor Chisholm [Email (mailto:victor.chisholm%40mcgill.ca)]
Undergraduate Research Officer
Office for Undergraduate Research in Science
Dawson Hall, Room 408-A
Tel.: 514-398-5964
Fax: 514-398-8102

Updated on *Wed, 2011-07-27 20:00*

Copyright © 2014 McGill University (http://www.mcgill.ca)

(http://www.mcgill.ca)

Home (/science/)

You have already submitted this form. View your previous submissions (/science/node/2087/submissions).

396 Form

* indicates required fields.
Please scan this form before starting to fill it out, to see what is required.

INSTRUCTIONS - PROFESSORS: Fill out Sections A & B then submit this form online. (You will receive an email copy of the form. The Office for Undergraduate Research in Science will also post the project online at www.mcgill.ca/science/research/ours/396/listing (https://www.mcgill.ca/science/research/ours/396/listing), indicating whether the project is open for students to apply or taken.)

INSTRUCTIONS - STUDENTS: You may receive this form by email, or you may download it from www.mcgill.ca/science/research/ours/396/listing (https://www.mcgill.ca/science/research/ours/396/listing) after it has been posted. Either way, print this form. Complete and sign Section C on the hardcopy. Ask your supervisor to sign Section D. Take it to the department* corresponding to the course number in Section A; this may or may not be your own department. (* EXCEPTIONS: For NSCI 396 and COGS 396, please bring it to the Interdisciplinary Programs Adviser in Dawson Hall.) Do not register for a '396' course on Minerva until you receive departmental permission. Have a discussion with your supervisor about time/work expectations, keeping in mind that this is a 3-credit course (roughly, 10 hours per week for 12 weeks). Remember that a '396' course is an elective.

INSTRUCTIONS - DEPARTMENTS: After the unit chair/director/designate approves (or not) this project, notify student. If approved, please give student permission to register on Minerva, and send a copy of this form (with signatures) to the Office for Undergraduate Research in Science *(either* fax 514-398-8102, *or* internal mail to Dawson Hall 408-A, *or* PDF scan + email).

QUESTIONS OR FEEDBACK? Contact Victor Chisholm by email, or phone 514-398-5964.

* indicates a required field

SECTION A: SUPERVISOR INFORMATION

Supervisor's Name: *

Supervisor's Email: *

After you press submit, a copy of this form will be sent to (1) this email address, (2) the student email address, if entered below, and (3) the Office for Undergraduate Research in Science.

Supervisor's Phone:

Supervisor's Website:

Supervisor's department: *

- Select -

Supervisor's department (if none of the above):

Normally the supervisor's department should match the course number's department.

Course number: *

- Select -

SECTION B: PROJECT INFORMATION

Term: *

Winter 2013-2014

Project start date: *

Monday, January 6, 2014

You may change the actual start and end dates on the hard copy later, when you and the student print and sign the form. (FALL classes begin Tuesday, September 3, 2013. WINTER classes begin Monday, January 6, 2014. SUMMER: dates vary, check with the department offering the course.)

Project end date: *

Friday, April 11, 2014

The student must present his/her final report EITHER: by the last day of classes; OR, subject to the following conditions, no later than the last day of the final exam period. Conditions to end the project during the exam period: that submissions can be reviewed and grades submitted by the appropriate deadline, and also that the workload required to complete the project not exceed that normally required to prepare for final examinations.

(FALL classes end Tuesday, December 3, 2013. WINTER classes end Friday, April 11, 2014. SUMMER: dates vary, check with the department offering the course.)

Project title: *

10 words or less suggested

Project description (50-100 words suggested): *

This should be appropriate for a 3-credit course; approximately 120 hours.

Prerequisite: *

1 term completed at McGill + CGPA of 3.0 or higher; or permissi

The standard prerequisite for '396' courses is "1 term completed at McGill + CGPA of 3.0 or higher; or permission of instructor."

Grading scheme (The final report must be worth at least 50% of final grade): *

FOR HGEN 396 PLEASE USE: "Final grade shall be based on an evaluation of laboratory (or equivalent) performance (40%), a final written report (50%), and an oral presentation (10%) by the supervisor. Details of the evaluation scheme will be provided by HGEN to supervisors and applicants." FOR MIMM 396/397, PLEASE USE: "Final grade shall be based on laboratory performance as evaluated by the research supervisor (50%) and the final written research report (minimum 10 pages) graded by the supervisor and the course coordinator or the coordinator's delegate (50%)."

Other project information:

OPTIONAL. The professor may use this field to indicate additional information to the applicant. For example: "This project involves fieldwork at ..."; "Applicants should read book/paper/website before applying."; "The best way to reach me is..."; etc.

Project status: *

- This project is open to applicant.
- This project is taken. The professor has no more '396' projects this term.
- This project is taken; however students may contact the professor to discuss other possible '396' projects this term.

How students can apply / Next steps: *

- For BIOL: After all parts of this application form are completed, and the hard copy is signed by the professor and the student, bring this application form and your unofficial transcript to Susan Gabe (Stewart Biology W3/25B) or Nancy Nelson (W3/25) during office hours.
- For HGEN: After all of the parts of this application forms are completed and the hard copy is signed by the professor and the student, bring the application form and a copy of your unofficial transcript to the Department of Human Genetics (to the attention of Dr. Patricia N. Tonin, Stewart Biology Building N5.13) during office hours.
- For MIMM: After all parts of this application form are completed, and the hard copy is signed by the professor and the student, bring this application form and your unofficial transcript to Prof. Gregory Marczynski during office hours, who will review/approve as the course coordinator for MIMM 396 (Microbiology) or MIMM 397 (Immunology).
- Bring a printed copy of this application form and your advising transcript to me during office hours.
- N/A; this project is filled.
- Other

If this is for HGEN 396, BIOL 396, MIMM 396, or MIMM 397, please choose the department-specific instructions.

If other, please specify:

Ethics, safety, and training: Supervisors are responsible for the ethics and safety compliance of undergraduate students. This project involves: *

- Animal subjects
- Human subjects
- Biohazardous substances
- Radioactive materials
- Handling chemicals
- Using lasers
- None of the above (NEITHER animal subjects, nor human subjects, nor biohazardous substances, nor radioactive materials, nor handling chemicals, nor using lasers)

SECTION C: STUDENT INFORMATION

Do not complete this section unless/until the student is identified.

Student's Name:

All of Section C can be filled out later on the hardcopy.

Student's McGill ID:

Student's Email (first.last@mail.mcgill.ca):

After you press submit, a copy of this form will be sent to (1) the supervisor's email address entered above, (2) the student email address, if entered here, and (3) the Office for Undergraduate Research in Science.

Student's Phone:

Student's Program:

For example: B.Sc. Maj. Chem. Min. Biol.

Student's Level (U0 / U1 / U2 / U3):

- None -

Student's signature - I certify that this course is with a different supervisor and on a different topic than any previous '396' course I have taken. I have not applied for another '396' course in this term:

Sign on the printed hard-copy.

SECTION D: APPROVALS.

Do not complete this section unless/until the student is identified.

Supervisor's signature - I give my permission for the student identified above to register for this project under my

supervision:

Please DO NOT enter anything online in this signature field. Please DO SIGN on the hard copy you will print later.

Date:

Unit chair/director/designate:

Unit chair/director/designate's name:

Unit chair/director/designate's signature - I certify that this project conforms to departmental requirements for 396 courses:

Please DO NOT enter anything online in this signature field.

Date:

Submitted by:

victor.chisholm@mcgill.ca

Email of authenticated user. THIS FIELD IS NON-EDITABLE.

Save Draft Submit form

Copyright © 2014 McGill University (http://www.mcgill.ca)

Course Number Change for CHEM 419

Proposal Reference Number : 8399
PRN Alias : 13-14#1812
Version No : 3
Submitted By : Dr Amy Blum
Edited By : Ms Josie D'Amico

Display Printable PDF

Summary of Changes: Subject/Course/Term, Restrictions

	Current Data	New Data
Program Affected?		Y
Program Change Form Submitted?		N (Simple Change) - Replace CHEM 419 with CHEM 519 where it appears in the following B.Sc. programs: Liberal Program - Core Science Component Atmospheric and Oceanic Sciences; Major Atmospheric Science; Honours Atmospheric Science (the changes in the Major and Honours programs have already been incorporated in the Major and Honours Program Change Form submitted separately); Major Environment - Atmospheric Environment and Air Quality; Major Environment -Water Environments and Ecosystems - Biological; Honours Earth System Science; Major Earth System Science; Honours Chemistry - Atmosphere and Environment; Major Chemistry - Atmosphere and Environment; B.Sc. Agr. Major Environment - Water Environments and Ecosystems - Biological. Also, replace CHEM 619 with CHEM 519 where it appears in M.Sc. Atmospheric and Oceanic Sciences (Thesis); M.Sc. Atmospheric and Oceanic Sciences - Environment (Thesis).
Subject/Course/Term	CHEM 419 • one term	CHEM 519 • one term
Credit Weight or CEU's	3 credits.	3 credits
Course Activities	• A - Lecture	Schedule Type: A - Lecture; Hours Per Week: 3 Total Hours per Week : 3 Total Number of Weeks : 13
Course Title	Course Title on Transcript: Advances in Chem of Atmosphere Course Title on Calendar: Advances in Chemistry of Atmosphere.	Course Title on Transcript: Advances in Chem of Atmosphere Course Title on Calendar: Advances in Chemistry of Atmosphere.
Rationale		We are combining the undergraduate 400- and graduate 600-level courses into a single 500-

		level course appropriate for both graduate students and senior undergraduates. This is justified by the following considerations: 1. The joint nature of these courses requires twice the effort to maintain. Maintaining four courses that essentially teach same material is unnecessary. 2. The 400- and 600-level courses are currently taught together, with the graduate students performing extra assignments. The principal extra assignment is a term paper, which doesn't necessarily justify the 600-level credit. 3. The overall enrolments are typically modest (5-20 per year in the combined 400- and 600-level class) and do not justify four separate courses. We seek to continue the yearly alternating ATOC/CHEM 519 naming so that each department receives appropriate credit for their teaching contributions.
Responsible Instructor		
Course Description	Selected areas of atmospheric chemistry from field and laboratory to theoretical modelling are examined. The principles of atmospheric reactions (gas, liquid and heterogeneous phases in aerosols and clouds) and issues related to chemical global change will be explored.	Selected areas of atmospheric chemistry from field and laboratory to theoretical modelling are examined. The principles of atmospheric reactions (gas, liquid and heterogeneous phases in aerosols and clouds) and issues related to chemical global change will be explored.
Teaching Dept.	0287 : Chemistry	0287 : Chemistry
Administering Faculty/Unit	SC : Faculty of Science	SC : Faculty of Science
Prerequisites	Prerequisites: CHEM 243, and CHEM 263 or CHEM 213 and CHEM 273, MATH 222 and MATH 315 (or equivalents) or permission of instructor.	Prerequisites: CHEM 243, and CHEM 263 or CHEM 213 and CHEM 273, MATH 222 and MATH 315 (or equivalents) or permission of instructor. Web Registration Blocked? : Y Minimum Grade or Test Scores : C Prereq course or test taken at the same time? : Y
Corequisites		
Restrictions	• Restriction: Not open to students who have taken ATOC 419, CHEM 619, or ATOC 619	Not open to students who have taken or are taking CHEM 419, CHEM 619, ATOC 419, ATOC 519 or ATOC 619.
Supplementary Calendar Info	1. Winter 2. 3 lectures 3. Offered in even years. Students should register in ATOC 419 in odd years.	1. Winter 2. 3 lectures 3. Offered in even years. Students should register in ATOC 419 in odd years.
Additional Course		

Charges		
Campus		Downtown
Projected Enrollment		
Requires Resources Not Currently Available		N
Explanation for Required Resources		
Consultation Reports Attached?		
Effective Term of Implementation		201409
File Attachments		No attachments have been saved yet.
To be completed by the Faculty		
For Continuing Studies Use		

Approvals Summary

Show all comments

Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
3								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Mar 20 2014
2								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Mar 20 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Mar 10 2014

Course Number Change for ATOC 419

Proposal Reference Number	: 8489
PRN Alias	: 13-14#1902
Version No	: 6
Submitted By	: Dr Daniel Kirshbaum
Edited By	: Ms Josie D'Amico

Display Printable PDF

Summary of Changes	Subject/Course/Term, Credit Weight or CEU's, Restrictions, Supplementary Calendar Info

	Current Data	New Data
Program Affected?		Y
Program Change Form Submitted?		N (Simple Change) - Replace ATOC 419 and CHEM 419 with ATOC 519 and CHEM 519 where they appear in the following programs: Diploma of Meteorology, Liberal program - Core Science Component Atmospheric and Oceanic Sciences, Major Atmospheric Science, Honours Atmospheric Science, (the changes in the Majors and Honours programs already been incorporated into the Majors and Honours program change proposal forms submitted separately), Major Environment - Atmospheric Environment and Air Quality, Major Environment -Water Environments and Ecosystems - Biological, Honours Earth System Science, Major Earth System Science, Honours Chemistry - Atmosphere and Environment, Major Chemistry - Atmosphere and Environment, B.Sc. Ag.: Major Environment -Water Environments and Ecosystems - Biological (60 credits), ----- Also, due to the related course retirement (ATOC 619), replace ATOC 619 with ATOC 519 where it appears in the following M.Sc. programs: M.Sc. Atmospheric and Oceanic Sciences (Thesis), M.Sc. Atmospheric and Oceanic Sciences - Environment (Thesis)
Subject/Course/Term	ATOC 419 • one term	ATOC 519 • one term
Credit Weight or CEU's	credits.	3 credits
Course Activities	• A - Lecture	Schedule Type: A - Lecture; Hours Per Week: 3 Total Hours per Week : 3 Total Number of Weeks : 13
Course Title	Course Title on: Advances in Chem of	Course Title on: Advances in Chem of

	Transcript: Atmosphere Course Title on Calendar: Advances in Chemistry of Atmosphere.	Transcript: Atmosphere Course Title on Calendar: Advances in Chemistry of Atmosphere.
Rationale		We are combining the undergraduate 400- and graduate 600-level courses into a single 500-level course appropriate for both graduate students and senior undergraduates. This is justified by the following considerations: 1. The joint nature of these courses requires twice the effort to maintain. Maintaining four courses that essentially teach same material is unnecessary. 2. The 400- and 600-level courses are currently taught together, with the graduate students performing extra assignments. The principal extra assignment is a term paper, which doesn't necessarily justify the 600-level credit. 3. The overall enrolments are typically modest (5-20 per year in the combined 400- and 600-level class) and do not justify four separate courses.
Responsible Instructor		Parisa Ariya
Course Description	Selected areas of atmospheric chemistry from field and laboratory to theoretical modelling are examined. The principles of atmospheric reactions (gas, liquid and heterogeneous phases in aerosols and clouds) and issues related to chemical global change will be explored.	Selected areas of atmospheric chemistry from field and laboratory to theoretical modelling are examined. The principles of atmospheric reactions (gas, liquid and heterogeneous phases in aerosols and clouds) and issues related to chemical global change will be explored.
Teaching Dept.	0291 : Atmospheric & Oceanic Sciences	0291 : Atmospheric & Oceanic Sciences
Administering Faculty/Unit	SC : Faculty of Science	SC : Faculty of Science
Prerequisites	Prerequisites: CHEM 243, and CHEM 263 or CHEM 213 and CHEM 273, MATH 222 and MATH 315 (or equivalents) or permission of instructor.	Prerequisites: CHEM 243, and CHEM 263 or CHEM 213 and CHEM 273, MATH 222 and MATH 315 (or equivalents) or permission of instructor. Web Registration Blocked? : N
Corequisites		
Restrictions	• Restriction: Not open to students who have taken CHEM 419, CHEM 619, and ATOC 619	Not open to students who have taken or are taking ATOC 419, ATOC 619, CHEM 419, CHEM 519 or CHEM 619
Supplementary Calendar Info	1. Winter 2. 3 hours lecture 3. Offered in odd years. Students should register in CHEM 419 in even years	1. Winter 2. 3 hours lecture 3. Offered in odd years. Students should register in CHEM 519 in even years
Additional Course		

Charges		
Campus		Downtown
Projected Enrollment		
Requires Resources Not Currently Available		N
Explanation for Required Resources		
Consultation Reports Attached?		
Effective Term of Implementation		201409
File Attachments		No attachments have been saved yet.
To be completed by the Faculty		
For Continuing Studies Use		

Approvals Summary

Show all comments

Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
6								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Mar 19 2014
5								Submitted to Curriculum/Academic Committee for approval Edited by: Daniel Kirshbaum on: Mar 19 2014
4								Submitted to Curriculum/Academic Committee for approval Edited by: Daniel Kirshbaum on: Mar 19 2014
3								Submitted to

								Curriculum/Academic Committee for approval Edited by: Daniel Kirshbaum on: Mar 17 2014
2								Submitted to Curriculum/Academic Committee for approval Edited by: Daniel Kirshbaum on: Mar 17 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Mar 16 2014

Course Retire for CHEM 619

Proposal Reference Number : 8398
PRN Alias : 13-14#1811
Version No : 3
Submitted By : Dr Amy Blum

Display Printable PDF

	Course to Retire
Program Affected?	Y
Program Change Form Submitted?	N (Simple Change) - Replace ATOC 619 with the newly renumbered course, ATOC 519, in the following programs: M.Sc. Atmospheric and Oceanic Sciences (Thesis) M.Sc. Atmospheric and Oceanic Sciences - Environment (Thesis).
Subject/Course/Term	CHEM 619 • one term
Credit Weight or CEU's	3 credits.
Course Activities	• A - Lecture
Course Title	Course Title on Transcript: Advanced Atmospheric Chemistry Course Title on Calendar: Advanced Atmospheric Chemistry.
Rationale	We are combining the undergraduate 400- and graduate 600-level courses into a single 500-level course appropriate for both graduate students and senior undergraduates. This is justified by the following considerations: 1. The joint nature of these courses requires twice the effort to maintain. Maintaining four courses that essentially teach same material is unnecessary. 2. The 400- and 600-level courses are currently taught together, with the graduate students performing extra assignments. The principal extra assignment is a term paper, which doesn't necessarily justify the 600-level credit. 3. The overall enrolments are typically modest (5-20 per year in the combined 400- and 600-level class) and do not justify four separate courses. We seek to continue the yearly alternating ATOC/CHEM 519 naming so that each department receives appropriate credit for their teaching contributions.
Course Description	The recent cutting-edge areas of planetary atmospheric chemistry from field and laboratory to theoretical modelling are examined. Photochemistry, kinetics (gas and surface) of organic and inorganic pollutants in atmosphere and atmospheric surfaces (clouds and aerosols). Satellite remote sensing of atmospheric chemical species, and issues related to chemical global change.
Teaching Dept.	0287 : Chemistry

Administering Faculty/Unit	GR : Graduate Studies
Prerequisites	Prerequisites: CHEM 213, CHEM 273, MATH 222 and MATH 315 or equivalents, or permission of instructor
Corequisites	
Restrictions	• Restriction(s): Offered in even years. Students should register in ATOC 619 in odd years. Not open to students who have taken or are taking ATOC 419, CHEM 419, or ATOC 619
Supplementary Calendar Info	1. 3 hours
Consultation Reports Attached?	
Effective Term of Implementation	201409
File Attachments	No attachments have been saved yet.
To be completed by the Faculty	
For Continuing Studies Use	

Approvals Summary

Show all comments

Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
3								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Mar 19 2014
2								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Mar 19 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Mar 10 2014

Course Retire for ATOC 619

Proposal Reference Number	: 8488
PRN Alias	: 13-14#1901
Version No	: 2
Submitted By	: Dr Daniel Kirshbaum

Display Printable PDF

	Course to Retire
Program Affected?	Y
Program Change Form Submitted?	N (Simple Change) - Replace ATOC 619 with the newly renumbered course, ATOC 519, in the following programs: M.Sc. Atmospheric and Oceanic Sciences (Thesis); M.Sc. Atmospheric and Oceanic Sciences - Environment (Thesis).
Subject/Course/Term	ATOC 619 • one term
Credit Weight or CEU's	3 credits.
Course Activities	• A - Lecture
Course Title	Course Title on Transcript: Advanced Atmospheric Chemistry Course Title on Calendar: Advanced Atmospheric Chemistry.
Rationale	We are combining the undergraduate 400- and graduate 600-level courses into a single 500-level course appropriate for both graduate students and senior undergraduates. This is justified by the following considerations: 1. The joint nature of these courses requires twice the effort to maintain. Maintaining four courses that essentially teach same material is unnecessary. 2. The 400- and 600-level courses are currently taught together, with the graduate students performing extra assignments. The principal extra assignment is a term paper, which doesn't necessarily justify the 600-level credit. 3. The overall enrolments are typically modest (5-20 per year in the combined 400- and 600-level class) and do not justify four separate courses.
Course Description	The recent cutting-edge areas of planetary atmospheric chemistry from field and laboratory to theoretical modelling are examined. Photochemistry, kinetics (gas and surface) of organic and inorganic pollutants in atmosphere and atmospheric surfaces (clouds and aerosols). Satellite remote sensing of atmospheric chemical species, and issues related to chemical global change.
Teaching Dept.	0291 : Atmospheric & Oceanic Sciences
Administering	GR : Graduate Studies

Faculty/Unit	
Prerequisites	Prerequisites: CHEM 213, CHEM 273, MATH 222 and MATH 315 or equivalents, or permission of instructor
Corequisites	
Restrictions	• Restriction(s): Offered in odd years. Students should register in CHEM 619 in even years. Not open to students who have taken or are taking ATOC 419, CHEM 419, or CHEM 619
Supplementary Calendar Info	1. 3 hours
Consultation Reports Attached?	
Effective Term of Implementation	201409
File Attachments	No attachments have been saved yet.
To be completed by the Faculty	
For Continuing Studies Use	

Approvals Summary

Show all comments

Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
2								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Mar 19 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Mar 16 2014

Program/Major or Minor/Concentration Revision Form

(07/2004)

1.0 Degree Title
Specify the two degrees for concurrent degree programs

Bachelor of Science

1.1 Major (Legacy= Subject) (30-char. max.)

Atmospheric Science

1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.)

1.3 Minor (with Concentration, if applicable) (30 char. max.)

1.4 Category

Faculty Program (FP)	**Honours (HON) X**
Major	Joint Honours Component (HC)
Joint Major	Internship/Co-op
Major Concentration (CON)	Thesis (T)
Minor	Non-Thesis (N)
Minor Concentration (CON)	Other
	Please specify

1.5

B.Sc. Honours in Atmospheric Science

2.0 Administering Faculty/Unit

Faculty of Science/Atmospheric & Oceanic Sciences

Offering Faculty/Department

Faculty of Science/Atmospheric & Oceanic Sciences

3.0 Effective Term of revision or retirement
Please give reasons in 5.0 "Rationale" in the case of retirement
(Ex. Sept. 2004 = 200409) Retirement

Term: **201409**

4.0 Existing Credit Weight **72-73**

Proposed Credit Weight **72-73**

5.0 Rationale for revised program

These program revisions do not alter the content; they simply subdivide the complementary courses into "core" courses and "streams", the latter allowing for specialization in one of three recognizable subdomains of atmospheric science (along with a general stream for students not wishing to specialize). These streams will strengthen the link between the AOS curriculum and subjects of high interest/importance to science and society, which will aid the AOS undergraduate recruiting efforts.

6.0 Revised Program Description (Maximum 150 words)

The revised Honours program offers the same courses as the previous program but introduces streams that allow students to specialize in one of three recognizable areas.

Students can be admitted to the Honours program after completion of the U1 year of the Major in Atmospheric Science program with a minimum GPA of 3.30. Students having completed a U1 year in a different program with high standing may be admitted to the Honours program on the recommendation of that department. A minimum GPA of 3.30 in the Honours program courses (taken as a whole) is required to remain in the program. A CGPA of 3.30 on the total program is also required to graduate with honours. Required Courses (27 credits) ATOC 214 Introduction: Physics of the Atmosphere (3 credits) ATOC 312 Rotating Fluid Dynamics (3 credits) ATOC 315 Thermodynamics and Convection (3 credits) ATOC 480 Honours Research Project (3 credits) COMP 208 Computers in Engineering (3 credits) MATH 222 Calculus 3 (3 credits) MATH 223 Linear Algebra (3 credits) MATH 314 Advanced Calculus (3 credits) MATH 315 Ordinary Differential Equations (3 credits) Complementary Courses (46 credits) 45-46 credits ~~Note: All students are encouraged to consult with the undergraduate adviser for help selecting from among the complementary courses. As general recommendations (but not programmatic requirements), students wishing to comply with Environment Canada recommendations for careers in operational meteorology are advised to take ATOC 215, 309, 512, 513, 540, 541, and 546. Students interested in atmospheric chemistry, aerosols, and cloud physics are advised to take ATOC 219, 309, 419, 521, 525, 540 and CHEM 223, 253. Suggested minors include math, physics, chemistry, computer science, earth and planetary science, and geography.~~ 27 credits at the 200 to 300 level 3-6 credits selected from: ATOC 215 Oceans, Weather and Climate (3 credits) ATOC 219 Introduction to Atmospheric Chemistry (3 credits) 3 credits selected from: ATOC 357 Atmospheric and Oceanic Science Laboratory (3 credits) PHYS 257 Experimental Methods 1 (3 credits) 3 credits selected from: PHYS 230 Dynamics of Simple Systems (3 credits) PHYS 251 Honours Classical Mechanics 1 (3 credits) 3 credits selected from: PHYS 232 Heat and Waves (3 credits) PHYS 253 Thermal Physics (3 credits) 3 credits selected from: CHEM 223 Introductory Physical Chemistry 1 (2 credits) CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit) MATH 319 Introduction to Partial Differential Equations (3 credits) 9-12 credits selected from: ATOC 309 Weather Radars and Satellites (3 credits) CHEM 243 Introductory Physical Chemistry 2 (2 credits) CHEM 362 Advanced Organic Chemistry Laboratory (2 credits) CHEM 367 Instrumental Analysis 1 (3 credits) MATH 203 Principles of Statistics 1 (3 credits) MATH 317 Numerical Analysis (3 credits) MATH 323 Probability (3 credits) MATH 324 Statistics (3 credits) PHYS 241 Signal Processing (3 credits) PHYS 331 Topics in Classical Mechanics (3 credits) PHYS 333 Thermal and Statistical Physics (3 credits) PHYS 340 Majors Electricity and Magnetism (3 credits) PHYS 342 Majors Electromagnetic Waves (3 credits) 18-19 credits at the 400 to 500 level, selected from the following (at least 12 credits must come from ATOC): ATOC 419 Advances in Chemistry of Atmosphere (3 credits) ATOC 512 Atmospheric and Oceanic Dynamics (3 credits) ATOC 513 Waves and Stability (3 credits) ATOC 515 Turbulence in Atmosphere and Oceans (3 credits) ATOC 521 Cloud Physics (3 credits) ATOC 525 Atmospheric Radiation (3 credits) ATOC 531 Dynamics of Current Climates (3 credits)	**Students can be admitted to the Honours program after completion of the U1 year of the Major in Atmospheric Science program with a minimum GPA of 3.30. Students having completed a U1 year in a different program with high standing may be admitted to the Honours program on the recommendation of that department.** **A minimum GPA of 3.30 in the Honours program courses (taken as a whole) is required to remain in the program. A CGPA of 3.30 on the total program is also required to graduate with honours**. **Required Courses (27 credits)** **ATOC 214 Introduction: Physics of the Atmosphere (3 credits)** **ATOC 312 Rotating Fluid Dynamics (3 credits)** **ATOC 315 Thermodynamics and Convection (3 credits)** **ATOC 480 Honours Research Project (3 credits)** **COMP 208 Computers in Engineering (3 credits)** **MATH 222 Calculus 3 (3 credits)** **MATH 223 Linear Algebra (3 credits)** **MATH 314 Advanced Calculus (3 credits)** **MATH 315 Ordinary Differential Equations (3 credits)** **Complementary Courses (46 credits)** **45-46 credits** **Note: Students are required to fulfill the core complementary requirements along with one of the four streams listed below. In cases of overlap, each course can only be used once toward the satisfaction of the core complementary courses or the chosen stream.** **Core complementary courses (24 credits)** **3-6 credits selected from:** **ATOC 215 Oceans, Weather and Climate (3 credits)** **ATOC 219 Introduction to Atmospheric Chemistry (3 credits) or CHEM 219** **3 credits selected from:** **ATOC 357 Atmospheric and Oceanic Science Laboratory (3 credits)** **PHYS 257 Experimental Methods 1 (3 credits)** **3 credits selected from:** **PHYS 230 Dynamics of Simple Systems (3 credits)** **PHYS 251 Honours Classical Mechanics 1 (3 credits)** **3 credits selected from:** **PHYS 232 Heat and Waves (3 credits)** **PHYS 253 Thermal Physics (3 credits)** **3 credits selected from:** **CHEM 223 Introductory Physical Chemistry 1 (2 credits)** **CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)** **MATH 319 Introduction to Partial Differential Equations (3 credits)** **6-9 credits selected from:** **CHEM 243 Introductory Physical Chemistry 2 (2 credits)** **CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)** **CHEM 367 Instrumental Analysis 1 (3 credits)** **CHEM 575 Chemical Kinetics (3 credits)** **MATH 203 Principles of Statistics 1 (3 credits) *** **MATH 317 Numerical Analysis (3 credits)** **MATH 319 Introduction to Partial Differential Equations (3 credits)** **MATH 323 Probability (3 credits)** **MATH 324 Statistics (3 credits) *** **PHYS 333 Thermal and Statistical Physics (3 credits)** **PHYS 340 Majors Electricity and Magnetism (3 credits)**** **PHYS 342 Majors Electromagnetic Waves (3 credits)***** **PHYS 350 Honours Electricity and Magnetism (3 credits)**** **PHYS 352 Honours Electromagnetic Waves (3 credits)***** **Streams (21-22 credits)** **WEATHER ANALYSIS AND FORECASTING STREAM (22 credits)** **ATOC 309 Weather Radars and Satellites (3 credits)** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 541 Synoptic Meteorology 2 (3 credits)** **ATOC 546 Current Weather Discussion (1 credit)** **6 credits selected from:** **ATOC 513 Waves and Stability (3 credits)** **ATOC 515 Turbulence in Atmosphere and Oceans (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)**

ATOC 540 Synoptic Meteorology 1 (3 credits) ATOC 541 Synoptic Meteorology 2 (3 credits) ATOC 546 Current Weather Discussion (1 credit) ATOC 558 Numerical Methods and Laboratory (3 credits) ATOC 568 Ocean Physics (3 credits) CHEM 575 Chemical Kinetics (3 credits) EPSC 542 Chemical Oceanography (3 credits) MATH 423 Regression and Analysis of Variance (3 credits) MATH 555 Fluid Dynamics (4 credits) * PHYS 432 Physics of Fluids (3 credits) * PHYS 551 Quantum Theory (3 credits) PHYS 559 Advanced Statistical Mechanics (3 credits) * Students may take PHYS 432 OR MATH 555.	**ATOC 531 Dynamics of Current Climates (3 credits)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **ATOC 568 Ocean Physics (3 credits)** **MATH 555 Fluid Dynamics (4 credits) ****** **PHYS 432 Physics of Fluids (3 credits) ****** **<u>CLIMATE SCIENCE (21 credits)</u>** **MATH 323 Probability (3 credits)** **MATH 324 Statistics (3 credits) *** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)** **ATOC 531 Dynamics of Current Climates (3 credits)** **9 credits (6 of which must be ATOC) selected from:** **ATOC 513 Waves and Stability (3 credits)** **ATOC 515 Turbulence in Atmosphere and Oceans (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **ATOC 568 Ocean Physics (3 credits)** **EPSC 513 Climate and the Carbon Cycle (3 credits)** **EPSC 542 Chemical Oceanography (3 credits)** **MATH 423 Regression and Analysis of Variance (3 credits)** **MATH 555 Fluid Dynamics (4 credits) ****** **PHYS 432 Physics of Fluids (3 credits) ****** **<u>ATMOSPHERIC CHEMISTRY AND PHYSICS (21 credits)</u>** **ATOC 309 Weather Radars and Satellites (3 credits)** **ATOC 519 Advances in Chemistry of Atmosphere (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **CHEM 223 Introductory Physical Chemistry 1 (2 credits)** **CHEM 243 Introductory Physical Chemistry 2 (2 credits)** **CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)** **CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)** **6 credits selected from:** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)** **ATOC 513 Waves and Stability (3 credits)** **ATOC 519 Advances in Chemistry of Atmosphere (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **CHEM 367 Instrumental Analysis 1 (3 credits)** **CHEM 575 Chemical Kinetics (3 credits)** **EPSC 513 Climate and the Carbon Cycle (3 credits)** **EPSC 542 Chemical Oceanography (3 credits)** **MATH 423 Regression and Analysis of Variance (3 credits)** **<u>GENERAL (21-22 credits)</u>** **21-22 credits (at least 15 of which must be ATOC) selected from:** **ATOC 309 Weather Radars and Satellites (3 credits)** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)** **ATOC 513 Waves and Stability (3 credits)** **ATOC 519 Advances in Chemistry of Atmosphere (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)** **ATOC 531 Dynamics of Current Climates (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 541 Synoptic Meteorology 2 (3 credits)** **ATOC 546 Current Weather Discussion (1 credit)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **ATOC 568 Ocean Physics (3 credits)** **CHEM 367 Instrumental Analysis 1 (3 credits)** **CHEM 575 Chemical Kinetics (3 credits)** **EPSC 513 Climate and the Carbon Cycle (3 credits)** **EPSC 542 Chemical Oceanography (3 credits)** **MATH 423 Regression and Analysis of Variance (3 credits)** **MATH 555 Fluid Dynamics (4 credits) ****** **PHYS 432 Physics of Fluids (3 credits) ****** *** Students cannot receive credit for both MATH 203 and MATH 324** **** Students cannot receive credit for both PHYS 340 and PHYS 350** ***** Students cannot receive credit for both PHYS 342 and PHYS 352** ****** Students cannot receive credit for both PHYS 432 or MATH 555**

8.0 Consultation with Related Units ☒ Yes ☐ No

Financial Consult ☐ Yes ☐ No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name	
Phone	
Email	
Submission Date	

To be completed by ARR:

CIP Code

8.0 Consultation with Related Units Yes [x] No [ ] Financial Consult Yes [ ] No [ ]

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name	Daniel Kirshbaum
Phone	
Email	Daniel.kirshbaum@mcgill.ca
Submission Date	

To be completed by ARR:

CIP Code

Josie D'Amico

From: Daniel Kirshbaum, Prof.
Sent: March-19-14 4:30 PM
To: Josie D'Amico
Subject: Fwd: Re: AOS stream in Atmospheric Chemistry and Physics

Consultation with Chemistry on the program changes...

Dan

-------- Original Message --------
Subject: Re: AOS stream in Atmospheric Chemistry and Physics
Date: Fri, 28 Feb 2014 11:29:55 -0500
From: Amy Szuchmacher Blum <amy.blum@mcgill.ca>
To: Daniel Kirshbaum <daniel.kirshbaum@mcgill.ca>
CC: David Ronis, Dr. <david.ronis@mcgill.ca>, John R. Gyakum, Prof. <john.gyakum@mcgill.ca>, Parisa A. Ariya, Dr. <parisa.ariya@mcgill.ca>

I don't see any problems with the Atmospheric Chemistry and Physics streams as described.

Regards,

Amy

On 2/24/2014 6:01 PM, Daniel Kirshbaum wrote:
> Dear Amy,
>
> Beyond the course-numbering changes that we have already discussed, we
> are hoping to propose some additional curriculum changes at the March
> academic-committee meeting. These do not involve the addition or
> removal of any programs or any change in the fundamental content of
> our curriculum. They simply reshape our complementary courses into
> so-called "streams" that will help to articulate the different focus
> areas of our field and enable students to specialize in them. These
> four streams are entitled
>
> 1. Weather analysis and forecasting
> 2. Climate Science
> 3. Atmospheric Chemistry and Physics
> 4. General
>
> Stream 3 above is very similar to our previous Majors and Honours
> programs in Atmospheric Chemistry, which we retired in 2013. Because
> there is significant Chemistry content in this stream, we are hoping
> that you could look at it and tell us if you approve of its existence
> and/or share any comments. Given the fact that it is very similar to
> our old programs, we doubt that Chemistry would find it
> objectionable. But we still wanted to request your approval before
> formally proposing it. So, we would greatly appreciate if you could
> review the stream in the attached document and let us know if you
> approve.

>
> Thanks and best regards,
> Dan
>

--

Dr. Amy Szuchmacher Blum
Assistant Professor
McGill University
Department of Chemistry
801 Sherbrooke Street West
Montreal, QC H3A 0B8
Canada

Josie D'Amico

From: Eric Galbraith
Sent: March-19-14 10:59 AM
To: Daniel Kirshbaum, Prof.
Cc: Jeanne Paquette, Dr.; William Minarik, Dr.; John R. Gyakum, Prof.; Josie D'Amico; Alfonso Mucci, Dr.
Subject: Re: EPSC 513

Hi Dan,

Fantastic! That sounds great to me, I'd be delighted to have those students in EPSC 513 and don't forsee any problems. (It also sounds like a great idea to split up the program into three streams.)

Thanks for the heads-up,

best regards
Eric

On Mar 19, 2014, at 10:47 AM, Daniel Kirshbaum <daniel.kirshbaum@mcgill.ca> wrote:

> Dear Jeanne, Bill, and Eric,
>
> At the Academic Committee meeting next week, AOS is proposing to modify our Majors and Honours programs. We are splitting our complementary courses into "core" complementaries and "streams". The streams are in various recognizable sub-disciplines of atmospheric science (Weather Analysis and Forecasting, Climate Science, and Atmospheric Chemistry and Physics).
>
> The impact of this on Earth and Planetary Sciences is quite minor. We are simply seeking to use the new EPSC 513 as a complementary course in our "Climate Science" stream.
>
> Given that our undergraduate enrollment is quite small, there are likely to be fewer than three AOS undergraduate students taking the course at a time.
>
> Is this incorporation of EPSC 513 into our streams OK with you? If possible, please let me know by Friday the 21st.
>
> best regards,
> Dan
>
> --
> Daniel J. Kirshbaum

Josie D'Amico

From: Daniel Kirshbaum, Prof.
Sent: March-19-14 3:59 PM
To: George McCourt
Cc: Kathryn Roulet, Ms; Josie D'Amico
Subject: Re: ATOC/CHEM 419

Hi George,

Thank you for your quick reply. I'm glad that you have no problems with the course revision.

Best regards,
Dan

On 14-03-19 2:45 PM, George McCourt wrote:

> Hello Daniel,
>
> Kathy sent me your e-mail about changing ATOC/CHEM 419 and ATOC/CHEM 619 to ATOC/CHEM 519. We have no problems with this.
>
> Thanks,
>
> George
>
> Senior Faculty Lecturer, McGill School of Environment
> Associate Director Undergraduate Affairs, McGill School of Environment
>
> McGill School of Environment
> Rowles House,
> Macdonald Campus of McGill University
> 21, 111 Lakeshore Road,
> Ste-Anne-de-Bellevue, QC, H9X 3V9
>
> Tel: 514-398-7550
> E-mail: george.mccourt@mcgill.ca
>
> ---
>
> **From:** Kathryn Roulet, Ms
> **Sent:** Wednesday, March 19, 2014 2:41 PM
> **To:** George McCourt
> **Subject:** Fwd: ATOC/CHEM 419
>
> Hi George:
>
> This is fine. The course will be automatically renumbered in our programs and students will then just take it as a 500-level course.
>
> - Kathy

Kathryn Roulet, M.Sc. | Program Adviser | McGill School of Environment | (514) 398-4306

The times and locations of my drop-in hours for the Winter 2014 term are shown on the MSE website: http://www.mcgill.ca/mse/students/student-resources/advising

Begin forwarded message:

> **From:** Daniel Kirshbaum <daniel.kirshbaum@mcgill.ca>
> **Date:** March 20, 2014 at 3:32:09 AM GMT+13
> **To:** <kathy.roulet@mcgill.ca>, <sylvie.deblois@mcgill.ca>
> **Cc:** "John R. Gyakum, Prof." <john.gyakum@mcgill.ca>, Josie D'Amico <josie.damico@mcgill.ca>
> **Subject: ATOC/CHEM 419**
>
> Dear Sylvie and Kathy,
>
> At the March academic meeting next week, AOS and Chemistry are proposing to renumber ATOC/CHEM 419 to ATOC/CHEM 519. The purpose for this change is to simplify the curriculum by turning four courses (ATOC/CHEM 419 and ATOC/CHEM 619) into two (ATOC/CHEM 519). This renumbering would have a very minor impact on the following programs, all of which use ATOC 419 as a complementary course:
>
> B.Sc.
> Major Environment - Atmospheric Environment and Air Quality (60 credits)
> Major Environment -Water Environments and Ecosystems - Biological (60 credits)
>
> B.Sc. Ag
> Major Environment -Water Environments and Ecosystems - Biological (60 credits)
>
> These changes would go into effect in Fall 2014. If possible, please let me know whether you approve of them by Friday March 21. My sincere apologies for the late notice.
>
> best regards,
> Dan
>
> --
> Daniel J. Kirshbaum
> Assistant Professor, McGill University
> Dept. of Atmospheric and Oceanic Sciences
> Room 839 Burnside Hall
> 805 Sherbrooke St West
> Montréal, QC H3A OB9 (Canada)
> Tel: 1-514-398-3347

Josie D'Amico

From: Daniel Kirshbaum, Prof.
Sent: March-19-14 4:31 PM
To: Josie D'Amico
Subject: Fwd: Re: Atmospheric Chemistry and Physics

Consultation with Physics on the program changes...

Dan

-------- Original Message --------
Subject: Re: Atmospheric Chemistry and Physics
Date: Thu, 13 Mar 2014 15:33:32 -0400
From: Guy Moore <guymoore@hep.physics.mcgill.ca>
To: Daniel Kirshbaum <daniel.kirshbaum@mcgill.ca>

```
Hi Dan,

Thanks for your detailed answers.  So physics has no objections to the
changes.

guy

On Thu, Mar 13, 2014 at 02:30:44PM -0400, Daniel Kirshbaum wrote:
> Dear Guy,
>
> Thanks for taking the time to look at the proposal and for providing
> very useful feedback.  Here are my responses to your two comments:
>
> 1. We had some difficulty naming the stream "Atmospheric Chemistry
> and Physics".  Our field is broadly subdivided into so-called
> atmospheric dynamics, physics, and chemistry.  Dynamics is
> geophysical fluid dynamics, physics is radiation, thermodynamics,
> and cloud microphysics, and chemistry is air and cloud chemistry. So
> our use of the term "Atmospheric Chemistry and Physics" includes
> radiation, thermodynamics, cloud microphysics, and chemistry.  This
> proposed stream contains courses on atmospheric radiation (ATOC
> 309), cloud microphysics (ATOC 521) and chemistry (ATOC 519 and 6
> credits of physical chemistry).  So  although there are no extra
> PHYS courses in the stream (beyond the core complementaries), there
> are the ATOC courses that specialize in atmospheric physics.
>
> We didn't name the stream "Atmospheric Chemistry" or "ATmospheric
> Physical Chemistry" because that would imply a more restrictive
> focus on chemistry.  On the other hand, we didn't choose "Physical
> meteorology", which is more synonymous with atmospheric physics and
> would have belied the chemistry component.
>
> 2. This is an oversight that probably should be corrected.
> Originally our program was limited to PHYS 230 and PHYS 232 - the
> honours versions could only be taken as exceptions.  However, we
> added the honours versions last year in response to vigorous student
> complaints about PHYS 232.  Students had better experiences in the
> honours version of PHYS 253 than in the PHYS 232 so we decided to
```

> provide that option (along with the analogous option for PHYS 230).
> Now that we have the honours options for those courses, it makes
> sense to have them for E&M also. So we will add that into the
> proposal to make it consistent. Thank you for pointing this out.
>
> Well, hopefully these explanations make some sense and do not raise
> any objections.
>
> best regards,
> Dan

--
Guy D. Moore
McGill University Dept. of Physics phone (514) 398-4345
room 313, Rutherford Building fax (514) 398-3733
3600 rue University e-mail guymoore@physics.mcgill.ca
Montreal QC H3A 2T8 Canada

Josie D'Amico FROM ESS AC-13-89 to AC-13-92 (Cores)

From: Daniel Kirshbaum, Prof.
Sent: March-21-14 9:15 AM
To: William Minarik, Dr.
Cc: Josie D'Amico
Subject: Re: ATOC/CHEM 419

Hi Bill (cc Josie),

Thanks for your response. I'm glad that ESS is OK with the course-number change.

The outline and syllabus will be very similar to ATOC 419. I'll ask Parisa to forward it to you once it's complete.

Best regards,
Dan

On 14-03-20 5:54 PM, William Minarik wrote:
> Hi Dan:
>
> This should be OK. It'll have limited impact on ESS; few of our
> students take p-chem, which is a prerequisite.
>
> I'd like to see a Course Outline or Syllabus when it's available so
> that I can advise interested students.
>
> Cheers,
> Bill
>
> On 14-03-19 10:55 AM, Jeanne Paquette wrote:
>> Hello Daniel
>>
>> I have only one question myself: since the course had been offered
>> at the 400- and 600-level, is it possible to let us know if there
>> were any differences in the method of evaluation between the two
>> levels? If there were differences, what balance in expectations will
>> be struck at the 500-level?
>>
>> If there is no change in pre-requisite or evaluation method from
>> the 400-level, this will have no material impact on the inclusion of
>> the course in the Earth System Science undergraduate programs. I
>> forward this to Bill Minarik who is the adviser for the Earth System
>> Science, for further input.
>>
>> Regards,
>>

McGill

Program/Major or Minor/Concentration Revision Form

(07/2004)

1.0 Degree Title
Specify the two degrees for concurrent degree programs

Bachelor of Science

1.1 Major (Legacy= Subject) (30-char. max.)

Atmospheric Science

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

Faculty Program (FP)	Honours (HON)
Major X	Joint Honours Component (HC)
Joint Major	Internship/Co-op
Major Concentration (CON)	Thesis (T)
Minor	Non-Thesis (N)
Minor Concentration (CON)	Other
	Please specify

1.5

B.Sc. Major in Atmospheric Science

2.0 Administering Faculty/Unit

Faculty of Science/Atmospheric & Oceanic Sciences

Offering Faculty/Department

Faculty of Science/Atmospheric & Oceanic Sciences

3.0 Effective Term of revision or retirement
Please give reasons in 5.0 "Rationale" in the case of retirement
(Ex. Sept. 2004 = 200409) Retirement

Term: **201409**

4.0 Existing Credit Weight **60-61**

Proposed Credit Weight **60-61**

5.0 Rationale for revised program

These program revisions do not alter the content; they simply subdivide the complementary courses into "core" courses and "streams", the latter allowing for specialization in one of three recognizable subdomains of atmospheric science (along with a general stream for students not wishing to specialize). These streams will strengthen the link between the AOS curriculum and subjects of high interest/importance to science and society, which will aid the AOS undergraduate recruiting efforts.

6.0 Revised Program Description (Maximum 150 words)

The revised Major program offers the same courses as the previous program but introduces streams that allow students to specialize in one of three recognizable areas.

7.0 List of existing program and proposed program	
Required Courses (24 credits) ATOC 214 Introduction: Physics of the Atmosphere (3 credits) ATOC 312 Rotating Fluid Dynamics (3 credits) ATOC 315 Thermodynamics and Convection (3 credits) COMP 208 Computers in Engineering (3 credits) MATH 222 Calculus 3 (3 credits) MATH 223 Linear Algebra (3 credits) MATH 314 Advanced Calculus (3 credits) MATH 315 Ordinary Differential Equations (3 credits)	**Required Courses (24 credits)** ATOC 214 Introduction: Physics of the Atmosphere (3 credits) ATOC 312 Rotating Fluid Dynamics (3 credits) ATOC 315 Thermodynamics and Convection (3 credits) COMP 208 Computers in Engineering (3 credits) MATH 222 Calculus 3 (3 credits) MATH 223 Linear Algebra (3 credits) MATH 314 Advanced Calculus (3 credits) MATH 315 Ordinary Differential Equations (3 credits)
Complementary Courses (37 credits) 36-37 credits ~~Note: All students are encouraged to consult with the Undergraduate Adviser for help selecting from among the complementary courses. As general recommendations (but not programmatic requirements), students wishing to comply with Environment Canada recommendations for careers in operational meteorology are advised to take ATOC 215, 309, 512, 513, 540, 541, and 546. Students interested in atmospheric chemistry, aerosols, and cloud physics are advised to take ATOC 219, 309, 419, 521, 525, 540 and CHEM 223, 253. Suggested minors include math, physics, chemistry, computer science, earth and planetary science, and geography.~~	**Complementary Courses (37 credits)** 36-37 credits **Note: Students are required to fulfill the core complementary requirements along with one of the four streams listed below. In cases of overlap, each course can only be used once toward the satisfaction of the core complementary courses or the chosen stream.**
3-6 credits selected from: ATOC 215 Oceans, Weather and Climate (3 credits) ATOC 219 Introduction to Atmospheric Chemistry (3 credits)	**Core complementary courses (21 credits)** 3-6 credits selected from: ATOC 215 Oceans, Weather and Climate (3 credits) ATOC 219 Introduction to Atmospheric Chemistry (3 credits) or CHEM 219
3 credits selected from: ATOC 357 Atmospheric and Oceanic Science Laboratory (3 credits) PHYS 257 Experimental Methods 1 (3 credits)	3 credits selected from: ATOC 357 Atmospheric and Oceanic Science Laboratory (3 credits) PHYS 257 Experimental Methods 1 (3 credits)
3 credits selected from: PHYS 230 Dynamics of Simple Systems (3 credits) PHYS 251 Honours Classical Mechanics 1 (3 credits)	3 credits selected from: PHYS 230 Dynamics of Simple Systems (3 credits) PHYS 251 Honours Classical Mechanics 1 (3 credits)
3 credits selected from: PHYS 232 Heat and Waves (3 credits) PHYS 253 Thermal Physics (3 credits)	3 credits selected from: PHYS 232 Heat and Waves (3 credits) PHYS 253 Thermal Physics (3 credits)
~~21-25 credits selected from the following (at least 12 credits must come from ATOC):~~ ~~ATOC 309 Weather Radars and Satellites (3 credits)~~ ~~ATOC 419 Advances in Chemistry of Atmosphere (3 credits)~~ ~~ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)~~ ~~ATOC 513 Waves and Stability (3 credits)~~ ~~ATOC 515 Turbulence in Atmosphere and Oceans (3 credits)~~ ~~ATOC 521 Cloud Physics (3 credits)~~ ~~ATOC 525 Atmospheric Radiation (3 credits)~~ ~~ATOC 531 Dynamics of Current Climates (3 credits)~~ ~~ATOC 540 Synoptic Meteorology 1 (3 credits)~~ ~~ATOC 541 Synoptic Meteorology 2 (3 credits)~~ ~~ATOC 546 Current Weather Discussion (1 credit)~~ ~~ATOC 558 Numerical Methods and Laboratory (3 credits)~~ ~~ATOC 568 Ocean Physics (3 credits)~~ ~~CHEM 223 Introductory Physical Chemistry 1 (2 credits)~~ ~~CHEM 243 Introductory Physical Chemistry 2 (2 credits)~~ ~~CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)~~ ~~CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)~~ ~~CHEM 367 Instrumental Analysis 1 (3 credits)~~ ~~CHEM 575 Chemical Kinetics (3 credits)~~ ~~EPSC 320 Elementary Earth Physics (3 credits)~~ ~~EPSC 340 Earth and Planetary Inference (3 credits)~~ ~~EPSC 542 Chemical Oceanography (3 credits)~~ ~~GEOG 322 Environmental Hydrology (3 credits)~~ ~~GEOG 372 Running Water Environments (3 credits)~~ ~~MATH 203 Principles of Statistics 1 (3 credits)~~ ~~MATH 317 Numerical Analysis (3 credits)~~ ~~MATH 319 Introduction to Partial Differential Equations (3 credits)~~ ~~MATH 323 Probability (3 credits)~~ ~~MATH 324 Statistics (3 credits)~~ ~~MATH 423 Regression and Analysis of Variance (3 credits)~~ ~~MATH 555 Fluid Dynamics (4 credits) *~~ ~~PHYS 241 Signal Processing (3 credits)~~ ~~PHYS 331 Topics in Classical Mechanics (3 credits)~~ ~~PHYS 333 Thermal and Statistical Physics (3 credits)~~ ~~PHYS 340 Majors Electricity and Magnetism (3 credits)~~ ~~PHYS 342 Majors Electromagnetic Waves (3 credits)~~ ~~PHYS 432 Physics of Fluids (3 credits) *~~ ~~* Students may take PHYS 432 OR MATH 555.~~	**6-9 credits selected from:** **CHEM 223 Introductory Physical Chemistry 1 (2 credits)** **CHEM 243 Introductory Physical Chemistry 2 (2 credits)** **CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)** **CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)** **CHEM 367 Instrumental Analysis 1 (3 credits)** **CHEM 575 Chemical Kinetics (3 credits)** **MATH 203 Principles of Statistics 1 (3 credits) *** **MATH 317 Numerical Analysis (3 credits)** **MATH 319 Introduction to Partial Differential Equations (3 credits)** **MATH 323 Probability (3 credits)** **MATH 324 Statistics (3 credits) *** **PHYS 333 Thermal and Statistical Physics (3 credits)** **PHYS 340 Majors Electricity and Magnetism (3 credits) **** **PHYS 342 Majors Electromagnetic Waves (3 credits) ***** **PHYS 350 Honours Electricity and Magnetism (3 credits) **** **PHYS 352 Honours Electromagnetic Waves (3 credits) ***** **Streams (15-16 credits)** **WEATHER ANALYSIS AND FORECASTING STREAM (16 credits)** **ATOC 309 Weather Radars and Satellites (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 541 Synoptic Meteorology 2 (3 credits)** **ATOC 546 Current Weather Discussion (1 credit)** **3 credits selected from:** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)** **ATOC 513 Waves and Stability (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 531 Dynamics of Current Climates (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **ATOC 568 Ocean Physics (3 credits)** **GEOG 322 Environmental Hydrology (3 credits)** **GEOG 372 Running Water Environments (3 credits)** **MATH 555 Fluid Dynamics (4 credits) ****** **PHYS 432 Physics of Fluids (3 credits) ****** **CLIMATE SCIENCE STREAM (15 credits)** **MATH 203 Principles of Statistics 1 (3 credits) *** **ATOC 531 Dynamics of Current Climates (3 credits)** **9 credits (at least 6 of which must be ATOC) selected from:** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)**

	ATOC 513 Waves and Stability (3 credits) **ATOC 519 Advances in Chemistry of Atmosphere (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **ATOC 568 Ocean Physics (3 credits)** **GEOG 322 Environmental Hydrology (3 credits)** **GEOG 372 Running Water Environments (3 credits)** **EPSC 513 Climate and the Carbon Cycle (3 credits)** **EPSC 542 Chemical Oceanography (3 credits)** **MATH 323 Probability (3 credits)** **<u>ATMOSPHERIC CHEMISTRY AND PHYSICS STREAM (15 credits)</u>** **ATOC 309 Weather Radars and Satellites (3 credits)** **ATOC 519 Advances in Chemistry of Atmosphere (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **CHEM 223 Introductory Physical Chemistry 1 (2 credits)** **CHEM 243 Introductory Physical Chemistry 2 (2 credits)** **CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)** **CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)** **<u>GENERAL STREAM (15-16 credits)</u>** **15-16 credits (at least 12 of which must be ATOC) selected from:** **ATOC 309 Weather Radars and Satellites (3 credits)** **ATOC 512 Atmospheric and Oceanic Dynamics (3 credits)** **ATOC 513 Waves and Stability (3 credits)** **ATOC 519 Advances in Chemistry of Atmosphere (3 credits)** **ATOC 521 Cloud Physics (3 credits)** **ATOC 525 Atmospheric Radiation (3 credits)** **ATOC 530 Paleoclimate Dynamics (3 credits)** **ATOC 531 Dynamics of Current Climates (3 credits)** **ATOC 540 Synoptic Meteorology 1 (3 credits)** **ATOC 541 Synoptic Meteorology 2 (3 credits)** **ATOC 546 Current Weather Discussion (1 credit)** **ATOC 558 Numerical Methods and Laboratory (3 credits)** **ATOC 568 Ocean Physics (3 credits)** **CHEM 367 Instrumental Analysis 1 (3 credits)** **CHEM 575 Chemical Kinetics (3 credits)** **EPSC 513 Climate and the Carbon Cycle (3 credits)** **EPSC 542 Chemical Oceanography (3 credits)** **GEOG 322 Environmental Hydrology (3 credits)** **GEOG 372 Running Water Environments (3 credits)** **MATH 555 Fluid Dynamics (4 credits) **** **PHYS 432 Physics of Fluids (3 credits) **** *** Students cannot receive credit for both MATH 203 and MATH 324** **** Students cannot receive credit for both PHYS 340 and PHYS 350** ***** Students cannot receive credit for both PHYS 342 and PHYS 352** ****** Students cannot receive credit for both PHYS 432 or MATH 555**

8.0 Consultation with Related Units Yes ☒ No ☐ Financial Consult Yes ☐ No ☐

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department	John R. Eyakuam	John R. Eyakuam	23 April 2014
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name	Daniel Kirshbaum
Phone	
Email	Daniel.kirshbaum@mcgill.ca
Submission Date	

To be completed by ARR:

CIP Code

McGill

Program/Major or Minor/Concentration Revision Form

(07/2004)

1.0 Degree Title
Specify the two degrees for concurrent degree programs

B.Sc.

1.1 Major (Legacy= Subject) (30-char. max.)

Major Computer Science

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

Faculty Program (FP)	Honours (HON)
Major	Joint Honours Component (HC)
Joint Major	Internship/Co-op
Major Concentration (CON)	Thesis (T)
Minor	Non-Thesis (N)
Minor Concentration (CON)	Other
	Please specify

1.5 B.Sc.; Major in Computer Science

2.0 Administering Faculty/Unit

Science/Computer Science

Offering Faculty/Department

Science / Computer Science

3.0 Effective Term of revision or retirement
Please give reasons in 5.0 "Rationale" in the case of retirement
(Ex. Sept. 2004 = 200409) Retirement

Term: 201409

4.0 Existing Credit Weight: 60-63

Proposed Credit Weight: 60-63

5.0 Rationale for revised program

We add to our program the requirement that at least 6 credits must be taken at the 400-level or above. We did not have this requirement before because there were very few COMP courses at the 300-level, thus, students would automatically be required to take courses at the 400-level or above. With the introduction of several 300-level courses this is no more the case. Therefore, the requirement is explicitly added to the program.

6.0 Revised Program Description (Maximum 150 words)

7.0 List of existing program and proposed program

MAJOR PROGRAM IN COMPUTER SCIENCE (60-63 credits)

*Students who have sufficient knowledge in a programming language do not need to take COMP 202.

Required Courses (30-33 credits)
COMP 202* (3) Foundations of Programming
COMP 206 (3) Introduction to Software Systems
COMP 250 (3) Introduction to Computer Science
COMP 273 (3) Introduction to Computer Systems
COMP 251 (3) Algorithms and Data Structures
COMP 302 (3) Programming Languages & Paradigms
COMP 303 (3) Software Development
COMP 310 (3) Operating Systems
MATH 222 (3) Calculus 3
MATH 223 (3) Linear Algebra
MATH 240 (3) Discrete Structures 1

Complementary Courses (30 credits)

Students should talk to an academic adviser before choosing their complementary courses.

At least 6 credits selected from:
COMP 330 (3) Theory of Computation
COMP 350 (3) Numerical Computing
COMP 360 (3) Algorithm Design

3-9 credits selected from:
MATH 318 (3) Mathematical Logic
MATH 323(3) Probability
MATH 324(3) Statistics
MATH 340(3) Discrete Structures 2

The remaining credits selected from computer science courses at the 300-level or above (except COMP 364, COMP 396, COMP 400).

Note: Students have to make sure that they have the appropriate prerequisites when choosing upper-level courses.

Revised program

MAJOR PROGRAM IN COMPUTER SCIENCE (60-63 credits)

*Students who have sufficient knowledge in a programming language do not need to take COMP 202.

Required Courses (30-33 credits)
COMP 202* (3) Foundations of Programming
COMP 206 (3) Introduction to Software Systems
COMP 250 (3) Introduction to Computer Science
COMP 273 (3) Introduction to Computer Systems
COMP 251 (3) Algorithms and Data Structures
COMP 302 (3) Programming Languages & Paradigms
COMP 303 (3) Software Development
COMP 310 (3) Operating Systems
MATH 222 (3) Calculus 3
MATH 223 (3) Linear Algebra
MATH 240 (3) Discrete Structures 1

Complementary Courses (30 credits)

Students should talk to an academic adviser before choosing their complementary courses.

At least 6 credits selected from:
COMP 330 (3) Theory of Computation
COMP 350 (3) Numerical Computing
COMP 360 (3) Algorithm Design

3-9 credits selected from:
MATH 318 (3) Mathematical Logic
MATH 323(3) Probability
MATH 324(3) Statistics
MATH 340(3) Discrete Structures 2

At least 6 credits at the 400-level or above (except COMP 400)

The remaining credits selected from computer science courses at the 300-level or above (except COMP 364, COMP 396, COMP 400).

Note: Students have to make sure that they have the appropriate prerequisites when choosing upper-level courses.

Attach extra page(s) as needed

8.0 Consultation with Related Units ☐ Yes ☐ No

Financial Consult ☐ Yes ☐ No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department		G Dudek	March 14/14
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name	
Phone	
Email	
Submission Date	

To be completed by ARR:

CIP Code

McGill

Program/Major or Minor/Concentration Revision Form

(07/2004)

1.0 Degree Title
Specify the two degrees for concurrent degree programs

1.1 Bachelor of Science

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

Physiology and Physics

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

Liberal Program	Honours (HON)
Faculty Program (FP)	Joint Honours Component (HC)
Major	Internship/Co-op
X Joint Major	Thesis (T)
Major Concentration (CON)	Non-Thesis (N)
Minor	Other
Minor Concentration (CON)	Please specify

1.5 B.Sc.; Physiology and Physics

2.0 Administering Faculty/Unit

Faculty of Science

Offering Faculty/Department

Faculty of Medicine/Department of Physiology

3.0 Effective Term of revision or retirement
Please give reasons in 5.0 "Rationale" in the case of retirement
(Ex. Sept. 2004 = 200409) Retirement

Term: 201409

4.0 Existing Credit Weight: 80

Proposed Credit Weight: 80

5.0 Rationale for revised program

PHGY 209 and 210 are now added in the U1 year as required courses as it was incorrectly listed in the complementary listing and they are prerequisites to U2 required courses.
MATH 315 (or MATH 325) must be taken in U1, and not in U2 as presently listed, since it is a prerequisite to MATH 437 and PHYS 413, one of which is taken by all students in U2 (MATH 437 and PHYS 413 are given in alternate years).
PHYS 241 is added in the U1 year as a required course to replace PHYS 328, which was incorrectly included in the program (in fact, PHYS 241 is a prerequisite to PHYS 328). PHYS 241 must be taken in U1as it is a prerequisite to PHYS 339, a required U2 course.

6.0 Revised Program Description (Maximum 150 words)

Major in Physiology & Physics (80 credits)

U1 Required Courses (17 credits)
* The corequisite BIOL 200, BIOL 201 is waived for this program.

MATH 222 Calculus 3 (3 credits)
PHGY 212 Introductory Physiology Laboratory 1(1 credit) *
PHGY 213 Introductory Physiology Laboratory 2(1 credit) *
PHYS 230 Dynamics of Simple Systems (3 credits)
PHYS 232 Heat and Waves (3 credits)
PHYS 257 Experimental Methods 1 (3 credits)
PHYS 258 Experimental Methods 2 (3 credits)

U2 Required Courses (21 credits)
MATH 326 Nonlinear Dynamics and Chaos (3 credits)
PHGY 311 Channels, Synapses & Hormones (3 credits)
PHGY 312 Respiratory, Renal, & Cardiovascular Physiology (3 credits)
PHGY 313 Blood, Gastrointestinal, & Immune Systems Physiology (3 credits)
PHGY 314 Integrative Neuroscience (3 credits)
PHYS 328 Electronics (3 credits)
PHYS 339 Measurements Laboratory in General Physics (3 credits)

U2 or U3 Required Courses (6 credits)

MATH 437 Mathematical Methods in Biology (3credits)
PHYS 413 Physical Basis of Physiology (3 credits)

U3 Required Courses (21 credits)

BMDE 519 Biomedical Signals and Systems (3 credits)
PHGY 461D1 Experimental Physiology (4.5 credits)
PHGY 461D2 Experimental Physiology (4.5 credits)
PHYS 333 Thermal and Statistical Physics (3 credits)
PHYS 340 Majors Electricity and Magnetism (3 credits)
PHYS 446 Majors Quantum Physics (3 credits)

Major in Physiology & Physics (80 credits)

U1 Required Courses (~~17~~ 26 credits)
* The corequisite BIOL 200, BIOL 201 is waived for this program.

MATH 222 Calculus 3 (3 credits)
PHGY 209 Mammalian Physiology 1 (3 credits)*
PHGY 210 Mammalian Physiology 2 (3 credits) *
PHGY 212 Introductory Physiology Laboratory 1(1 credit) *
PHGY 213 Introductory Physiology Laboratory 2(1 credit) *
PHYS 230 Dynamics of Simple Systems (3 credits)
PHYS 232 Heat and Waves (3 credits)
PHYS 241 Signal Processing (3 credits)
PHYS 257 Experimental Methods 1 (3 credits)
PHYS 258 Experimental Methods 2 (3 credits)

U2 Required Courses (~~21~~ 18 credits)
MATH 326 Nonlinear Dynamics and Chaos (3 credits)
PHGY 311 Channels, Synapses & Hormones (3 credits)
PHGY 312 Respiratory, Renal, & Cardiovascular Physiology (3 credits)
PHGY 313 Blood, Gastrointestinal, & Immune Systems Physiology (3 credits)
PHGY 314 Integrative Neuroscience (3 credits)
~~PHYS 328 Electronics (3 credits)~~
PHYS 339 Measurements Laboratory in General Physics (3 credits)

U2 or U3 Required Courses (6 credits)
(Note: These courses are offered in alternate years)

MATH 437 Mathematical Methods in Biology (3credits)
PHYS 413 Physical Basis of Physiology (3 credits)

U3 Required Courses (21 credits)
BMDE 519 Biomedical Signals and Systems (3 credits)
PHGY 461D1 Experimental Physiology (4.5 credits)
PHGY 461D2 Experimental Physiology (4.5 credits)
PHYS 333 Thermal and Statistical Physics (3 credits)
PHYS 340 Majors Electricity and Magnetism (3 credits)
PHYS 446 Majors Quantum Physics (3 credits)

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)	Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)
U1 Complementary Courses (9 credits) 3 credits, one of: MATH 223 Linear Algebra (3 credits) MATH 247 Honours Applied Linear Algebra (3 credits) 6 credits selected as follows: ** The corequisite BIOL 200, BIOL 201 is waived for this program. PHGY 209 Mammalian Physiology 1 (3 credits) PHGY 210 Mammalian Physiology 2 (3 credits) ** **U2 Complementary Courses (6 credits)** 3 credits, one of: MATH 315 Ordinary Differential Equations (3 credits) MATH 325 Honours Ordinary Differential Equations (3 credits) 3 credits, one of: MATH 248 Honours Advanced Calculus (3 credits) MATH 314 Advanced Calculus (3 credits) Attach extra page(s) as needed	**U1 Complementary Courses (9 6 credits)** 3 credits, one of: **MATH 315 Ordinary Differential Equations (3 credits)** **MATH 325 Honours Ordinary Differential Equations (3 credits)** 3 credits, one of: MATH 223 Linear Algebra (3 credits) MATH 247 Honours Applied Linear Algebra (3 credits) ~~6 credits selected as follows:~~ ~~** The corequisite BIOL 200, BIOL 201 is waived for this program.~~ ~~PHGY 209 Mammalian Physiology 1 (3 credits)~~ ~~PHGY 210 Mammalian Physiology 2 (3 credits) **~~ **U2 Complementary Courses (6 3credits)** ~~3 credits, one of:~~ ~~MATH 315 Ordinary Differential Equations (3 credits)~~ ~~MATH 325 Honours Ordinary Differential Equations (3 credits)~~ 3 credits, one of: MATH 248 Honours Advanced Calculus (3 credits) MATH 314 Advanced Calculus (3 credits)

B.Sc. Physiology & Physics

8.0 Consultation with Related Units ☒ Yes ☐ No

Financial Consult ☐ Yes ☒ No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department	Dr. John Orlowski		Feb. 13/14
Curric/Acad Committee	Dr. Ragsdale, Chair		27 feb 2014
Faculty 1	Dr. Davis, Assoc Dean		Feb 27 '14
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name	Sonia Viselli
Phone	514-398-3689
Email	sonia.viselli@mcgill.ca
Submission Date	February 13, 2014

To be completed by ARR:

CIP Code

CONSULTATION REPORT FORM
RE COURSE/PROGRAM PROPOSALS

DATE: February 13, 2014

TO: Professor G. Moore
Department of Physics

FROM: Sonia Viselli
Department of Physiology

The attached proposal will be submitted to the Curriculum/Academic Committee in Faculty of Science, and since it is the joint Major Physiology and Physics it is necessity that we consult with your department.

Can you please review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal.

___X___ NO OBJECTIONS _____ SOME OBJECTIONS

COMMENTS: Physics views these changes as long overdue and necessary to free the program from unlisted prerequisites and prerequisite conflicts.

Signature: **Guy D Moore (sent electronically)**

Date: **26 February 2014**

McGill

Program/Major or Minor/Concentration Revision Form

(2013)

1.0 Degree Title
Specify the two degrees for concurrent degree programs

Doctor of Philosophy (Ph.D.); Mathematics & Statistics

1.1 Major (Legacy= Subject) (30-char. max.)

Mathematics & Statistics

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

- ☐ Faculty Program (FP)
- ☐ Major
- ☐ Joint Major
- ☐ Major Concentration (CON)
- ☐ Minor
- ☐ Minor Concentration (CON)
- ☐ Honours (HON)
- ☐ Joint Honours Component (HC)
- ☐ Internship/Co-op
- ☒ **Thesis (T)**
- ☐ Non-Thesis (N)
- ☐ Other

Please specify

1.5 Complete Program Title

Doctor of Philosophy (Ph.D.); Mathematics and Statistics

2.0 Administering Faculty/Unit

Graduate and Postdoctoral Studies/ Mathematics & Statistics

Offering Faculty/Department

Science/ Mathematics & Statistics

3.0 Effective Term of revision or retirement
Please give reasons in 5.0"Rationale" in the case of retirement
(Ex. Sept. 2004 = 200409) ☐ Retirement

Term: **201409**

4.0 Existing Credit Weight **0**

Proposed Credit Weight **0**

5.0 Rationale for revised program

Many students entering the Ph.D. program already have a Master's degree, and are exempted from a number of the required credits. The proposed changes will simply formalize what is already the case in practice, thereby reducing administrative work.
For students without a Master's degree or without the appropriate background, the department can always add additional requirements at the time of admission. Therefore, the change to the program will yield benefits without damaging the integrity of the Ph.D. program.

6.0 Revised Program Description (Maximum 150 words)

7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)	Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)
Doctor of Philosophy (Ph.D.); Mathematics and Statistics **Program Requirements** **Thesis** A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain. **Required Courses** MATH 700 Ph.D. Preliminary Examination Part A (0) MATH 701 Ph.D. Preliminary Examination Part B (0) **Complementary Courses** ~~Twelve approved graduate courses, at the 500, 600, or 700 level, of 3 or more credits each.~~	**Doctor of Philosophy (Ph.D.); Mathematics and Statistics** **Program Requirements** **Thesis** A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain. **Required Courses** MATH 700 Ph.D. Preliminary Examination Part A (0) MATH 701 Ph.D. Preliminary Examination Part B (0) **Complementary Courses** **At least six approved graduate courses for a total of 21 credits or more, with at least two courses at the 600-level or above.**

Attach extra page(s) as needed

8.0 Consultation with Related Units ☐ Yes ☐ No Financial Consult ☐ Yes ☐ No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
CGPS			
SCTP			
APC			
Senate			

Submitted by

Name	Spencer Keys-Schatia
Phone	
Email	grad.mathstat@mcgill.ca
Submission Date	

To be completed by ARR:

CIP Code

10. FQRSC (Research) Indicator (for GPS): Yes No

TO: Academic Committee, Faculty of Science
Arts Curriculum Committee, Faculty of Arts

FROM: Laurie Hendren, Chair
B.A. & Sc. PAC

DATE: April 2, 2014

SUBJECT: Proposal to Allow B.A. & Sc. Students to Take Geography Major Concentrations in BOTH Arts and Science

The Department of Geography offers several undergraduate programs leading to B.A. and B.Sc. degrees, as well as the B.A. & Sc degree. Currently, B.A. & Sc. students can select *either* their Arts component *or* their Science component from Geography. However, the Major Concentration in Geography (Urban Studies) (Arts component) and the Major Concentration in Geography (Physical Geography) (Science component) contain very little overlap.

Proposal:
That B.A. & Sc. students be permitted to choose *both* the Major Concentration in Geography (Urban Studies) and the Major Concentration in Geography (Physical Geography) for their program, as Arts and Science components, respectively. For the small amount of overlap that exists between the Major Concentrations, students would replace overlapped courses with other Complementary Courses.

This proposal was approved by the B.A. & Sc. PAC on March 26, 2014.

March 2014

Department of Geography

Memo/ proposal

GEOG 205 addition to the Science Freshman program
List of Approved Science course

Background

The Faculty of Science Freshman Program currently includes 6 courses covering general math and science breadth, plus a 7th Science Complementary course from a *List of Approved Freshman Science Courses.* Students can choose one course for a list of 19 approved courses offered by departments in the Faculty of Science. Currently, there is only a single course (ESYS 104: The Earth System) included in this list to reflect the combined interests and topics in the Departments of Geography, Earth and Planetary Sciences (EPS), and Atmospheric and Ocean Sciences (ATOC). There is limited growth in enrolment in ESYS 104, and there is negligible evidence that it has contributed to recruitment and 'marketing' of these departments and disciplines among freshman science students.

The option of ESYS 104 in the Science Freshman Program does not currently reflect the topics, theories, perspectives, and teachings available in individual departments, including Geography. The course does not currently provide freshman students with a sense of '*what is geography'* and has not been an effective mechanism for recruitment into Geography BSc programs from the science freshman cohort.

Proposal

We herein propose that an introductory level physical geography course (GEOG 205) be added to the List of Approved Freshman Science courses.

GEOG 205 (Global Change: Past, Present & Future) is one of the Department of Geography's introductory physical geography (i.e. science-based) courses, and is not currently a component of the department's programs. The course cannot be used by geography students for program credit except by special permission of the advisor. GEOG 205 is accepted in programs of other departments/schools or is used as an elective course.

This proposed addition would aim to: 1) Educate freshman science students on the content, topics, and application of geographic concepts and perspectives, predominantly focusing on physical geography, but also including interactions with human geography and sustainability, 2) Increase enrolment in GEOG programs by BSc students, and 3) Increase enrolment in GEOG courses.

This proposal could in theory be combined with, or followed by, similar proposals from ATOC and EPS.

Dr. Lea Berrang Ford
Assistant Professor
Chair, Undergraduate Affairs Committee
McGill Department of Geography

AC-13-96

Freshman Program (30 credits)

Offered by: Science **Degree:** Bachelor of Science

Program Requirements

Students who need 97-120 credits to complete their degree requirements will normally be registered in the Science Freshman Program until they complete their first year. They must consult an adviser in the Science Office for Undergraduate Student Advising (SOUSA) to obtain advice and approval of their course selection. Full details are available on the SOUSA website at http://www.mcgill.ca/science/student/newstudents/u0 (http://www.mcgill.ca/science/student/newstudents/u0). Academic advising is also available by email. The address is newstudentadvising.science@mcgill.ca (mailto:newstudentadvising.science%40mcgill.ca).

Students normally complete 30 credits which must include at least seven courses from the list of Approved Freshman Science Courses, selected as follows:

General Math and Science Breadth

Six of the Freshman courses to satisfy one of the following:

Option 1) 2 courses from MATH and 4 courses from BIOL, CHEM or PHYS;
or
Option 2) 3 courses from MATH and 3 courses from BIOL, CHEM or PHYS.

Science Complementary

The seventh course is chosen from the list of Approved Freshman Science Courses.

Notes:
1. Students who have not studied all of Biology, Chemistry, and Physics at the grade 12 level or equivalent are strongly advised to include at least one course in the missing discipline in their Freshman Program.
2. Many students will complete more than seven courses from the Approved Freshman Science Courses list, particularly those who wish to leave several options open for their choice of major.
3. Students entering the Freshman Program should be aware of the department specific requirements when selecting their courses. Detailed advising information is available at http://www.mcgill.ca/science/student/newstudents/u0/bscfreshman/specific (http://www.mcgill.ca/science/student/newstudents/u0/bscfreshman/specific).
4. The maximum number of courses per term, required, complementary, and elective, is five.
5. Some medical and dental schools have specific freshman course requirements. Check the admission requirements of the school(s) to which you intend to apply.

List of approved Freshman Science Courses

Select the approved courses according to the instructions above.

BIOL 111 Principles: Organismal Biology (3 credits) (/study/2014-2015/courses/biol-111)

BIOL 112 Cell and Molecular Biology (3 credits) (/study/2014-2015/courses/biol-112)

CHEM 110 General Chemistry 1 (4 credits) (/study/2014-2015/courses/chem-110)

CHEM 115 Accelerated General Chemistry: Giants in Science (4 credits) * (/study/2014-2015/courses/chem-115)

CHEM 120 General Chemistry 2 (4 credits) * (/study/2014-2015/courses/chem-120)

COMP 202 Foundations of Programming (3 credits) (/study/2014-2015/courses/comp-202)

ESYS 104 The Earth System (3 credits) (/study/2014-2015/courses/esys-104)

MATH 133 Linear Algebra and Geometry (3 credits) ** (/study/2014-2015/courses/math-133)

MATH 134 Enriched Linear Algebra and Geometry (3 credits) *** (/study/2014-2015/courses/math-134)

PSYC 100 Introduction to Psychology (3 credits) (/study/2014-2015/courses/psyc-100)

* CHEM 115 (/study/2014-2015/courses/chem-115) is not open to students who are taking or have taken CHEM 110 (/study/2014-2015/courses/chem-110) or CHEM 120 (/study/2014-2015/courses/chem-120).
* CHEM 120 (/study/2014-2015/courses/chem-120) is not open to students who have taken CHEM 115 (/study/2014-2015/courses/chem-115).
** Not open to students who are taking or taken MATH 134 (/study/2014-2015/courses/math-134).
*** MATH 134 (/study/2014-2015/courses/math-134) is an enriched version of MATH 133 (/study/2014-2015/courses/math-133). MATH 134 (/study/2014-2015/courses/math-134) may be used instead of MATH 133 (/study/2014-2015/courses/math-133) to: (1) provide a course prerequisite; and (2) satisfy program requirements.

First calculus course, one of:

MATH 139 Calculus 1 with Precalculus (4 credits) (/study/2014-2015/courses/math-139)

MATH 140 Calculus 1 (3 credits) (/study/2014-2015/courses/math-140)

MATH 150 Calculus A (4 credits) (/study/2014-2015/courses/math-150)

Second calculus course, one of:

MATH 141 Calculus 2 (4 credits) (/study/2014-2015/courses/math-141)

MATH 151 Calculus B (4 credits) (/study/2014-2015/courses/math-151)

First physics course, one of:

PHYS 101 Introductory Physics - Mechanics (4 credits) (/study/2014-2015/courses/phys-101)

GEOG 205 GLOBAL CHANGE: PAST, PRESENT + FUTURE (3 credits)

PHYS 131 Mechanics and Waves (4 credits) (/study/2014-2015/courses/phys-131)

Second physics course, one of:

PHYS 102 Introductory Physics - Electromagnetism (4 credits) (/study/2014-2015/courses/phys-102)

PHYS 142 Electromagnetism and Optics (4 credits) (/study/2014-2015/courses/phys-142)

Electives

Students wishing to take elective courses may choose them from introductory courses offered by departments in the Faculties of Science or of Arts. A list of recommended courses is found at http://www.mcgill.ca/science/student/newstudents/u0/bscfreshman/suggeste... (http://www.mcgill.ca/science/student/newstudents/u0/bscfreshman/suggested-elective-courses). Certain courses offered by other faculties may also be taken, but some restrictions apply. Consult the SOUSA website at http://www.mcgill.ca/science/student/continuingstudents/bsc/outside/ (http://www.mcgill.ca/science/student/continuingstudents/bsc/outside/) for more information about taking courses from other faculties.

Faculty of Science—2014-2015 (last updated Feb. 18, 2014) (disclaimer (/study/2014-2015/disclaimer))

McGill University Department of Geography
GEOG 205 Global Change: Past, Present and Future (Winter 2014)

Prof. Gail Chmura Room 628, Burnside Hall; (514)926-6854, gail.chmura@mcgill.ca **Office hours by appointment.**	**Prof. Navin Ramankutty** Room 627, Burnside Hall; 398-8428, navin.ramankutty@mcgill.ca **Office hours: Wed 11am-noon; Thurs 1-2pm.**

Teaching Assistants: Contact Teaching Assistants at GEOG205TA@hotmail.com

To contact us, email the addresses above and please put GEOG205 in the subject line.

This course examines the changes that have occurred in the global environment, through the last 2 million years (Quaternary) to the present day, and the possible changes in this century associated with the greenhouse effect, climate change and land use change. The course has three components:

1. Present-day climate & climate change: how the present-day patterns of climate and vegetation are generated and distributed, basics of climate change; (Ramankutty/Chmura)
2. Changes in the Earth's climate, vegetation and landscapes during the last 2 million years (through the last "Ice Age" to the recent past); the ways in which we study these changes; can these past variations be used as evidence against global warming or human's role in it? (Chmura)
3. Future climate change: predictions of climate change, attributing to human activities, climate change impacts, solutions. We will also briefly touch on land use change. (Ramankutty)

This course has no prerequisites, but is a science course.

Lectures will be Tuesday and Thursday, 10:05 - 11:25 hr in Maass Chemistry Building 112.

Required Reading:

The following are required texts available for purchase at the bookstore and on reserve at McClennan Library (Humanities and Social Sciences).

1. Mann, M.E. and L.R. Kump, 2008. *Dire Predictions: Understanding global warming*. DK Publishing Inc., London (see reading list for required sections to read for each lecture)
2. Imbrie, J. and K.P. Imbrie, 1979. *Ice Ages: Solving the Mystery*. Harvard University Press, Cambridge, MA. (The entire, short book is required reading.)

Powerpoints (from Prof. Ramankutty) and lecture texts (from Prof. Chmura) and other additional material will be posted on the Mycourses site.

Supporting material is on reserve at the Humanities and Social Sciences Library:

- Christopherson, R. and Byrne, M.L.. 2009. *Geosystems*, Prentice Hall.
- Strahler, A and Strahler, A. 2005. *Physical Geography.* Wiley.

Marking:

The final grade for the course will be composed of the following:

Two term tests, in-class Feb 11 (25%), Mar 18 (25%)	50%
Two assignments (12.5% each)	25%
Final exam (centrally scheduled during exam period)	25%

The final exam is cumulative in the sense that the science is cumulative (later material builds on earlier material), but each test and final exam will focus on material not covered by previous exams.

Schedule Conflicts. In the past, some students have signed up for this class at the same time as another class or lab, and missed most lectures. First, this is illegal. Second, please do not use this as an excuse. We expect you attend all classes, and if you will miss a class, to make alternate arrangements to catch up on material or find out vital announcements.

Class Etiquette. Out of common courtesy, your professors request a few things of you. While students are in class, they are expected to give their full attention to the professor or the videotape, if one is being shown. Mobile computing and communications devices are permitted in class insofar as their use does not disrupt the teaching and learning process. It is impolite to read, talk, sleep, or otherwise conduct yourselves in a way that disrupts the class. If you know before class that you will have to leave early sit towards the back near the door so as not to disrupt the class. Likewise, if you arrive late, please enter from the back of the class.

Late Assignments. Unless you have received permission to miss the deadline (e.g., you have a medical excuse or other crisis) your score will be reduced by 10 percentage points for every day it is late, including weekends. If you do not submit a late assignment in person you must notify us that you have turned it in.

Missed Exam. Make-up exams will be available only to those students who have valid reasons for missing the exam. These include medical problems (a doctor's note is necessary) and family emergencies. If you have missed an exam contact a Prof or TA as soon as possible. We cannot provide a make-up for the final exam; this is arranged by the University.

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest for more information).
Although you may discuss your assignment questions, preparation of answers must be an individual effort. Your written material must be your own and unique.

Other matters

- *For information on university and department policies for student assessment, please go to http://www.mcgill.ca/geography/studentassessment*
- In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.
- © Instructor generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.
- While we endeavor to provide an inclusive learning environment, if you experience barriers to learning in this course, do not hesitate to discuss them with us and the Office for Students with Disabilities, 514-398-6009.
- In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

McGill University Department of Geography
GEOG 205 Global Change: Past, Present and Future (Winter 2014)

Tentative Lecture Schedule winter term 2014

Date	Topic	Instructor
Jan-7	Introduction to class	Chmura/Ramankutty
Jan-9	Is our planet in peril? What are the major global challenges?	Ramankutty
Jan-14	Film: The Great Global Warming Swindle	Chmura/Ramankutty
Jan-16	What are biomes? How are they distributed globally and why?	Chmura
Jan-21	What determines the Earth's climate today?	Ramankutty
Jan-23	Climate change basics	Ramankutty
Jan-28	Observations of climate change	Ramankutty
Jan-30	Intro to geologic time, dating techniques and critical climate events in Earth's history	Chmura
Feb-4	The Ice Ages: the Evidence on the Land; Film: the Recent Ice Age	Chmura
Feb-6	Ice Ages Evidence in the ocean and ice; Film: Coring the Greenland Ice Cap	Chmura
Feb-11	**Exam 1 (covers material through & including Feb 4, but not after)**	Chmura/Ramankutty
Feb-13	Changes in the levels of land and sea **(Assignment 1 distributed)**	Chmura
Feb-18	Enormous lakes and serious erosion: the story of the melting ice	Chmura
Feb-20	Rapid climate change!: The "Younger Dryas"	Chmura
Feb-25	Megafaunal Extinctions – the mammoth almost made it	Chmura
Feb-27	Film: Land of the Mammoth **(Assignment 1 due)**	Chmura
Mar-4	Reading Week	
Mar-6	Reading Week	
Mar-11	Slow climate change: the "Climatic Optimum or Hypsithermal",	Chmura
Mar-13	The "Medieval Warm Period" the "Little Ice Age"	Chmura
Mar-18	**Exam 2 (covers material through & including Mar 11)**	Chmura
Mar-20	Film: "Earth: The Operators' Manual"	Ramankutty
Mar-25	Climate models and what they say about the future **(Assignment 2 distributed)**	Ramankutty
Mar-27	How do we know that humans are causing climate change?	Ramankutty
Apr-1	Why should we worry? What are some impacts of climate change?	Ramankutty
Apr-3	How can we stabilize climate?	Ramankutty
Apr-8	Another inconvenient truth: Global land use change **(Assignment 2 due)**	Ramankutty
Apr-10	Course review	Ramankutty

Deadline for course changes is Jan 21

FINAL EXAM (date & time centrally scheduled) Ramankutty/Chmura

Academic Mission
Faculty of Science, McGill University

May 15, 2014

1 Introduction

The Faculty of Science prides itself on its undergraduate academic programs. This document summarizes the academic programs offered by Faculty, outlines the guiding principles, and summarizes the structure and functioning of the Academic Committee.

2 Summary of Academic Programs

The Faculty of Science offers B.Sc. degrees through the departments and Schools in the Faculty of Science (Atmospheric and Oceanic Sciences, Biology, Chemistry, Computer Science, Earth and Planetary Sciences, Geography, Mathematics and Statistics, Physics and Psychology) as well as administering and awarding degrees in five biomedical areas where the actual departmental units are part of the Faculty of Medicine (Anatomy and Cell Biology, Biochemistry, Microbiology and Immunology, Pharmacology and Physiology). In addition to department-specific programs, there are many joint programs which combine studies from two departments, and there are two interdisciplinary programs: (1) the Neuroscience program jointly offered by Biology, Physiology and Psychology; and (2) the Earth System Science program offered by Atmospheric and Oceanic Sciences, Earth and Planetary Sciences and Geography. In addition to the departments, Redpath Museum offers some courses and a Minor.

The Faculty of Science offers a significant number of programs in the B.A. and B.A.&Sc. Degrees as well. The B.A. programs include those in Computer Science, Geography, Mathematics and Statistics, and Psychology. In the case of Geography and Psychology, the majority of students in those departments follow B.A. programs.

The B.A.&Sc degree programs are jointly offered by the Faculty of Science and the Faculty of Arts and students follow a program from both faculties. Most units in Science have a 36-credit major concentration available in the B.A.&Sc. Degree. In addition, Science units participate in the three inter-faculty B.A.&Sc programs, namely: Cognitive Science; Environment; Sustainability, Science and Society.

There are two major differences between the B.Sc. and B.A. programs. First, the entrance requirements are different. Entry into the B.Sc. programs requires a Science CEGEP DEC or the completion of the Science Freshman Program. Second, most of the B.A. programs are multi-track ones, consisting of a 36-credit major concentration, plus a minor or a second major. In contrast, most of existing B.Sc. programs are significantly larger, requiring at least 54 credits, but do not

require a second program (except for the B.Sc. Liberal, which is closer to the Arts multi-track model).

2.1 The three kinds of B.Sc. degrees

There are three main kinds of degrees offered: Major, Honours, and Liberal. The current descriptions of these programs, as paraphrased from the 2014-2015 Undergraduate Calendar, are as follows.

Major Program: A major is a versatile, comprehensive primary area of study. Most major programs require about two-thirds of the total program credits. The remaining credits can be used for electives, or to take a minor (a small program which is usually 18-24 credits) which can be chosen from a wide variety of areas both within and outside Science.

Honours Program: Honours programs typically involve an even higher degree of specialization than majors, include supervised research, and require students to maintain a high academic standard. An honours program provides solid preparation for graduate school. Honours programs also help develop critical thinking approaches and analytical perspectives which are skills that are highly desirable for students contemplating further studies in graduate schools or in professional schools such as medicine, law or management.

Liberal Program: The Liberal program is a flexible and modular program which combines a core science component (CSC) in a Science discipline with a breadth component, which may be a minor from a wide variety of areas, a major concentration from the Faculty of Arts, or a second CSC from any group in Science.

2.2 The structure of a B.Sc.

A B.Sc. degree at McGill consists of four years of study (120 credits) for students entering from outside Quebec, and three years of study (90 credits) for Quebec students coming from the CEGEP system. A normal course load is five 3-credit courses per term and each year has two terms, Fall and Winter.

Students entering McGill from a high school outside of Quebec complete a special 30-credit Freshman program and then a 90-credit departmental program. Students entering McGill from the Quebec CEGEP start directly into the 90-credit departmental program. Students entering with advanced placement credits are evaluated on an individual basis and can receive up to 30 credits towards the Freshman program. Students in the Freshman program are said to be in their U0 year, whereas the three years of the departmental programs are called U1, U2 and U3.

All programs are expressed in terms of required and complementary courses. Required courses must be taken by all students in the program, whereas the complementary courses offer some choice and allow students to specialize within their program. Usually, but not always, the complementary courses are in the same discipline as the program. The number of program credits is the sum of the number of credits of required courses and the number of credits of complementary courses. A typical Major Program requires around 60 credits. Normally Liberal programs require about 45 program credits, and the Honours programs require more program credits than Major programs. All students must complete 90 credits and the credits that remain after the required and complementary courses have been accounted for are called elective courses. For example, if a program specifies 60 credits of required/complementary courses, then a student has 30 credits of electives (for students

starting in the freshman program, they may have additional elective credits in their freshman (U0) year). There are currently very few restrictions on which elective courses may be taken. Any course offered by the Faculty of Science or the Faculty of Arts is an acceptable elective course and many courses from other faculties are also allowed. Some students use their elective courses to complete a second program such as a minor.

2.3 The structure of a B.A.&Sc.

The B.A.&Sc. degree has its own version of the 30 credit U0 Freshman program, which includes core math and science courses, as well as some Arts requirements.

After many years of clarifying the purpose of the B.A.&Sc. degree, the structure has been simplified so that the the 90 credit main program comes in two main flavours, a multi-track version and an interfaculty version. The multi-track version requires students to complete two 36-credit major concentrations, one in Arts and one in Science. The interfaculty version allows students to choose one of the predefined interdisciplinary programs which currently includes: Cognitive Science; Environment; and Sustainability, Science and Society. There are also Honours versions of the multi-track and interfaculty programs. In addition to their program, all B.A.&Sc. students must complete a special integrative course, BASC 201.

2.4 Course Levels and Numbering

The Faculty of Science has taken a principled approach to the numbering of courses.[1]

There is a set group of freshman courses (those taken by students coming from outside of Quebec, directly from high school), which mostly have 100 course numbers (the current exception is COMP 202). In addition, at the 100-level there are three special categories of courses: (1) FIGS 196 are non-credit First-Year Interest Groups, (2) 199 courses are First-Year Seminar Courses, which are small seminar-style courses, and (3) 18x courses are General Interest Courses. Courses numbered at the 200, 300 and 400 levels form the core of the discipline-specific programs. Courses at the 500 level are typically advanced undergraduate courses that are also suitable for beginning graduate students.

3 Guiding Principles for Academic Programs

3.1 Quality: Students, Professors and Programs

The Faculty of Science prides itself on the high quality of its students, professors and academic programs.

The quality of students is maintained by ensuring that the entrance requirements, for all applicant groups, are kept at a very high level. Students accepted into the Faculty of Science must have demonstrated a very high overall academic average, as well as demonstrating high-level grades in core mathematics and science courses. The high quality of the professors is maintained by hiring the best professors, and ensuring that those professors take pride in good undergraduate teaching. The high quality of the academic programs is ensured by each department designing the courses

[1] The guidelines are available at: `https://www.mcgill.ca/science/sites/mcgill.ca.science/files/CourseLevelsDraft2-1.pdf`.

and programs carefully, as well as the peer-review of all course and program changes through the Academic Committee.

3.2 Teaching and Research: the Teacher-Scholar Model

Professors in the Faculty of Science are active researchers, and it is those same active researchers who are also in front of the classrooms teaching the undergraduates. Most of the professors also actively include undergraduates in their research through undergraduate research courses, lab placements, and summer undergraduate research projects. As of 2014, over half of the graduating B.Sc. students had completed at least one undergraduate research course in their degree.

Teaching is a key part of the job for all Faculty of Science professors, and the quality of the teaching is evaluated for merit and promotion, including promotion to Full Professor.

There are also many professors from the Faculty of Medicine who make important contributions to teaching undergraduate courses in the B.Sc. programs.

3.3 A Spectrum of Choices

As outlined in the first part of this document, students in the Faculty of Science have a wide variety of programs to choose from. They may select a broad-based Liberal program, a more focused Major program, or a highly-specialized Honours program. They also have the opportunity to choose between a single discipline or an interdisciplinary program. Students may follow an interdisciplinary program in many ways, including: (1) choosing a joint-major or joint-honours program, (2) choosing an explicitly interdisciplinary program like Neuroscience or Earth System Science, or (3) adding a minor to their program.

Interdisciplinary programs have become much more popular in recent years. In 2007 just over 10% of the B.Sc. students with a declared major (not including freshman or undeclared students) were in a joint or interdisciplinary program, whereas this has grown to over 25% in 2013. This growth is due to both an increased interest in well established joint programs like Mathematics & Physics, Physiology & Physics, and Physiology & Mathematics; as well as the introduction of new interdisciplinary programs such as Neuroscience and the new joint Biology and Mathematics, and Computer Science and Biology programs.

3.4 Depth and Breadth

Whether a single discipline, or an interdisciplinary program, the Faculty of Science ensures that all programs have both depth and breadth. Programs are designed so that students must complete a core component, and that they must also proceed to some advanced courses (courses at the 400 or 500 level), in at least one specialized area.

3.5 Fundamentals, Work and Learning

Courses and programs in the Faculty of Science are designed to ensure that students are exposed to the correct fundamentals of their discipline, and they are provided with a wide variety of homework exercises, assignments, writing exercises, labs, and field trips to aid them in their learning. It is understood that students must take an active part in their own learning, and that it is through their hard work that they master the material.

3.6 Extras

Students in the Faculty of Science have many ways in which they can enrich their academic experience. Over the last decade the Faculty has spearheaded the growth of undergraduate research, which is coordinated by the Office of Undergraduate Research. There has also been an active development of local and international field courses, and complete field study programs such as the Field Study Semesters in Panama and Africa, which are managed by the Faculty of Science. In addition, students may participate in paid internships.

4 Academic Committee

Courses and programs in the Faculty of Science are constantly being updated to adapt to new material, subjects, and the hiring of new faculty members.

The Academic Committee (AC) of the Faculty of Science is where all course and program proposals are discussed and fine-tuned. The committee is chaired by the Dean, and is composed of faculty representatives from each department, a representative from the library, student representatives, the Director of Advising, and the Associate Dean (Academic).

The committee considers all proposals that originate from the departments, as well as faculty-wide issues like teaching guidelines, program guidelines, or faculty-wide initiatives such as the 396 research courses. The committee works in a very collegial fashion, and forms an important bridge between the departments.

In the case of the biomedical units, course and program proposal originate with the departments, and then are discussed and approved by the Undergraduate Biomedical Curriculum Committee before submission to the Academic Committee.

The administrative staff in the Faculty offices, including the Associate Dean (Academic), the Assistant to the Dean (currently Josie D'Amico) and the Administrative Coordinator, all work to help the departments put forward changes to their courses and programs. They are always available to help the departments, as well as providing on-line documentation at `https://www.mcgill.ca/science/about/administration/help-minerva-course-proposal-revision`.

Trottier Institute for Science and Public Policy

Martin Grant, Dean, Faculty of Science. 16 April 2014.

1. Introduction and rationale

An integral academic duty is service, service which is informed by and makes use of our academic mission of teaching and research. In a University, we recognize and accept a duty to spread knowledge to the world through outreach and engagement in public policy. In particular, the application of science to public policy is one of the ways scientific knowledge is disseminated, and an area in which our approach to the creation and in particular the validation of knowledge must play a larger role. Being a great University, or aspiring to be one, confers upon one not only the praise and respect of colleagues at other institutions, but it further confers upon one responsibility: the responsibility to disseminate our approach. In particular, promoting the application of rigorously tested ideas and methods to the apparent anarchy which can sometimes drive public policy in science.

Through the visionary support of Lorne Trottier, this mission will be undertaken by the Trottier Institute for Science and Public Policy. The Trottier Institute will be committed to developing and promoting policies that expand the contribution of science to human welfare. Its aim is to enhance the positive contribution of science and technology to society. The mission is two-fold. Firstly, to provide leadership in advancing science-driven policy, and to prepare future generations of leaders for this responsibility. This leadership will come from scientists themselves, whose research will be funded based on ability to affect matters of public policy. Secondly, with the help of the Office of Science and Society, the Trottier Institute for Science and Public Policy will help improve the ability of non-scientists to make decisions on issues that involve science, medicine, and technology, through public education and outreach. The Institute will coordinate activities with other related initiatives, including in particular, the Trottier Institute for Sustainability in Engineering Design in the Faculty of Engineering, and the Wolfe Chair in Scientific and Technological Literacy in the Faculty of Arts.

2. Trottier Professors

One way the Institute will enact this mandate is through the Trottier Professors which are Fellowships in Science and Public Policy. These are academic awards that enable the University to encourage a policy element in scientific inquiry conducted by world-class scholars at the University. Such Fellowships will rotate at intervals of approximately two years, and are open to scientists in all Faculties

throughout the University.

The Fellowships act to give a research boost to scientists doing excellent work, where that work will have impact or potential impact upon public policy. Letters of intent are welcome from scientists or teams of scientists within the Faculty of Science, or any other Faculty at McGill. The intention of the Fellowships is (a) to recognize and support excellence, (b) to recognize and support scientific leadership, particularly the collaborative leadership of a research agenda, (c) to provide seed money for emerging research directions, including those of an interdisciplinary nature, and (d) to have impact or potential impact upon public policy. As such, the Fellowships are consistent with the Faculty and University strategic plans. The program is structured in parallel to Science's Fessenden Professor program for commercialization: letters of intent are requested when the Trottier Public Science Policy Fellow endowment has sufficient funds to plausibly support Fellowships. As such it functions as a "Venture Capital" (VC) fund, albeit a VC fund devoted to public science policy impact. It is expected that most Fellowships will be for no more than two years in duration, and that the amount of total funding will be of order 50K-100K of research funds, typically to provide partial support for graduate student funding. It is expected that between one to three Fellowships will be approved per round of proposals.

In accord with the terms of the gift, the first three Professorship appointments have been made to Professor Lea Berrang-Ford (Department of Geography, Faculty of Science), Professor Elena Bennett (McGill School of Environment and Department of Natural Resource Sciences, Faculty of Agricultural and Environmental Sciences), and Professor Catherine Potvin (Department of Biology, Faculty of Science).

3. Governing Board

A Board will lead the Trottier Institute. The Board consists of the Director, the Dean of Science, the Director of the Office of Science and Society, a representative of the Trottier Family Foundation, a previous Trottier Public Policy Fellow, and other representatives as named by the Dean. The Director will be responsible for, amongst other activities, coordinating the calls for proposals for the Trottier Professors, and identifying appropriate reviewers for applications to provide advice to the Dean on these appointments. The first interim Director will be Professor Vicky Kaspi, Trottier Chair in Astrophysics.

The reviewers will be drawn from a college of public science policy experts inside and outside of academia. The interim Director will act to begin creating the college, which will consist of, at least, current and previous Trottier Public Science

Policy Professors, the Wolfe Chair in Science and Technological Literacy, and the Director of the Trottier Institute for Sustainability in Engineering Design.

4. Coordination with outreach activities

In accord with the terms of the gift, the Institute will coordinate outreach activities in Science, and ensure good coordination with other outreach activities at McGill and elsewhere. Science Outreach at McGill disseminates our scientific expertise to a wider community through programmes and activities such as talks, lab visits, family workshops, in-school presentations, and documentary films. These activities within Science include, at least, the previously mentioned activities at the Office of Science and Society, the Astrophysics outreach program, the program at the Redpath Museum, and the "inreach" program to support staff, Science Talks about Research for Staff (STARS).

Outreach is a responsibility of service. Further it is one way we express our values of excellence and respect for achievement — at the international level — within the local community. Outreach connects the public to the fun and excitement of science at a leading research university, shares our research and lets us discuss scientific issues in our community, and cultivates an interest and appreciation of science. It is a way to show how our research-intensive university contributes to society, by making science education accessible and interactive for students, teachers, and the community. This is well expressed by the Lorne Trottier Public Science Symposium, established in 2005, whose goal is "to inform, inspire debate and raise public awareness on contemporary issues confronting society today" as well as by the parallel annual Miniscience series endowed by the Trottier Family Foundation which provides an educational outreach program on topics of interest and importance over seven weeks, designed to offer the public an insider's view of science.

Our outreach programs provide us with a platform to go forward. In particular, they provide the strong foundation to make the leap from outreach to public policy, in partnership with the Humanities. It is a long-term grand challenge to address the re-integration and re-convergence of the Sciences and the Humanities.

5. Coordination with undergraduate research program

Finally, the Institute will act to administer the undergraduate research activities in the Faculty of Science, established in 2005, including the summer undergraduate research award program, the annual undergraduate research conference, and related academic and outreach activities. These initiatives have been justifiably popular with students and staff, they are key to our future success as a Fac-

ulty and as a University. activities. Appropriate administrative resources will be allocated from the Faculty to facilitate this.

This is in recognition of the support from the Trottier Family Foundation to provide a matching fund for the award of Summer Undergraduate Research Awards. Beyond facilitating the activities of the Undergraduate Research Office, the Institute will introduce programs for involvement in outreach and public policy impact for undergraduates, graduate students, and postdocs, and work towards this involvement being a routine part of their McGill experience.

S-13-34

TO: Members of the Faculty of Science

DATE: April 16, 2014

SUBJECT: **Results of Science e-Election for Senate**

Following the recent Call for Nominations to elect four Science Senators, only four nominations were received. Thus the four nominees are elected to the Senate by acclamation. The following people are the new Science Senators.

Professor Masad Damha (Chemistry)
Professor Peter Grütter (Physics)
Professor John Gyakum (Atmospheric & Oceanic Sciences)
Professor Alfonso Mucci (Earth & Planetary Sciences)

These new Senators will start their terms on September 1, 2014. Their terms will end on August 31, 2017.

Continuing Faculty representatives on Senate, and the number of years they have yet to serve are:

Professor Graham Bell (Biology)	- one year
Professor Gregory Dudek (Computer Science)	- two years
Professor David Harpp (Chemistry)	- one year
Professor Jacques Hurtubise (Mathematics & Statistics)	- two years
Professor Timothy Moore (Geography)	- two years

Congratulations to the four new Senators, and a message of appreciation for the work of the continuing Senators.

Josie D'Amico
Secretary of Faculty