FACULTY OF SCIENCE
ACADEMIC COMMITTEE

Minutes of the meeting held on 22 November 2016, at 2:30 p.m. in Arts Council Room, Arts 160.

PRESENT: Dean Bruce Lennox (Chair), Associate Dean Tamara Western, Associate Dean Laura Nilson, Director Nicole Allard, Professors Huy Bui, Monroe, Cohen, Timothy Merlis, Thomas Duchaine, Peter Grutter, Michael Hendricks, Amy Blum, Michael Langer, Jeanne Paquette, Greg Marczynski, Barbara Hales, Andrew Cumming, Ana Nijnik, Caroline Palmer; Ms. Kathy Roulet, Ms. Natalie Waters, Mr. Ryan Bouma, Ms. Jasmine Leung, Mr. Gary Tom, Ms. Christina Kim, Ms. Therese Koch

REGRETS: Professors Melania Cristescu, Anthony Mittermaier, Michel Lapointe, Axel Hundemer; Mr. Daniel da Costa, Ms. Elisabeth Sulmont, Ms. Jacqueline Chan

DOCUMENTS: AC-16-5, AC-16-8 to AC-16-27

Dean Lennox welcomed everyone to the second Academic Committee meeting of the year, and called the meeting to order at 2:30 p.m.

(1) ADOPTION OF AGENDA

Associate Dean Western noted that Prof. Monroe Cohen would be attending the meeting in order to discuss the program changes to the Major and Honours in Neuroscience and requested therefore that these agenda items be moved to after the QLS discussion.

Prof. Hales **moved,** seconded by Prof. Paquette, that the Agenda be adopted.

The motion carried.

(2) MINUTES OF 25 OCTOBER 2016

Professor Langer **moved,** seconded by Prof. Hales, that the Minutes be approved.

The motion carried.

(3) BUSINESS ARISING FROM THE MINUTES

MINOR IN NANOTECHNOLOGY **AC-16-5**

Associate Dean Western welcomed Prof. Grutter, inviting Prof. Grutter, one of the advisors to this minor. She summarized the Academic Committee's concern that this minor is almost entirely composed of 400- and 500-level courses that have a number of prerequisite courses, thus making many of these courses inaccessible to students, considering the stipulation that 18 credits must be used exclusively for the minor. She said the question before the committee now is whether to allow B.Sc. students the option to take this minor or not.

Prof. Grutter said that, depending on the courses students take outside this minor, some may be able to complete it. He also said some subfields may be better suited to B.Sc. students (for example, nano-biology) that other subfields like nano-pharmacology and that, therefore, this minor should be flagged for advising given the case-by-case nature of its feasibility.

Prof. Palmer said that she worried students may be misled into thinking they can complete this minor without considering that most courses listed require several prerequisites.

Associate Dean Western suggested that perhaps this minor could be tailored more specifically to B.Sc. students. Dean Lennox agreed and requested that roadmaps be drawn up representing several scenarios in which students electing to pursue this minor were able to complete it. He also requested that committee members let Associate Dean Western know which of the courses listed in this minor are not appropriate for or relevant to nanotechnology.

Associate Dean Western **moved** that the Minor in Nanotechnology be approved for B.Sc. students. Director Allard amended the motion to include a note about advising in the eCalendar listing of this minor.

With a final vote of seven for, nine against and two abstentions the motion failed. Dean Lennox said he will ensure this Minor listing is removed from the next iteration of the eCalendar and Prof. Grutter said that, as advisor, he will inform B.Sc. students that this Minor is not available to them.

(4) Quantitative Life Sciences PhD Program **AC-16-9**

Dean Lennox explained that a novel inter-department and inter-faculty Ph.D. training program in Quantitative Life Sciences had been proposed to him for approval. He said that, although this program did not follow the typical approval process, it was important him to have the feedback of the Academic Committee. He said the members' thoughts, concerns and recommendations would inform his vote regarding this program.

Associate Dean Western said that the ad-hoc procedure for this program meant that there were no traditional New Program or New Course forms so she drafted these in order to help the committee better understand this program. She said the committee's vote on whether or not to approve this program and its capstone course would constitute the committee's advice to the Dean.

Prof. Grutter said that fifty potential supervisors for the PhD program were contacted and have signed on to the program. Regarding IQLS 600 – the program's capstone course – Director Allard asked what the process was regarding oversight and coordination of this team-taught course. Prof. Grutter said, between the people who've developed this course, there are some sixteen options for teachers and that, in fact, there is more interest in teaching these blocks then there are spots available. Prof. Grutter said that the Graduate Program Director is Prof. Greenwood and that the search is underway for a coordinator appointed by appointed by the GPD. He further said that, in terms of funding, this position would be under the Graduate & Postdoctoral Studies Office.

Prof. Grutter said this PhD training program is for students who have strong quantitative skills and a background in mathematics, statistics and computer science as well as a demonstrated interest in life sciences. He said that Students will have the opportunity to follow one of several well-defined streams and that, so far, three streams are proposed:

- Computational and Statistical Molecular Biology: Computational, statistical and mathematical approaches for the study of genetic and molecular biology questions.
- Biophysics: Applications of physics to the design of cutting edge tools to study biological questions, and to model biomolecules, molecular machines, cellular processes, and complete cells.
- Ecosystems: Mathematical and computational approaches in ecology, evolution, and infectious disease.

He said that, while these streams are quite different from the life sciences perspective, they each use essentially the same computational tools. He further noted that these fields usually have a hard time attracting statisticians and others with this background to them making this proposed program all the more exciting.

Prof. Grutter said students whose laboratories and offices are physically located at laboratories located across campus will have access to seminars and departmental activities, especially those highlighting related and relevant topics. Moreover, in an effort to build a sense of community amongst participants of the QLS Ph.D. Program, Prof. Grutter said there will be a mandatory monthly half-day seminar series that will move around campus to ensure all students are familiar with the laboratories and physical spaces associated with the QLS program. Prof. Grutter also noted that a full-day retreat for all students and supervisors in the program will occur once a year. QLS students will be required to present their research to the academic community through short talks and presentations. An annual meeting of all faculty members with supervisory privilege in the QLS program will also occur at the retreat as a forum for discussions regarding the status and progress of the QLS graduate program. He said the hope is that this event and others will strengthen and maintain interdisciplinary discussions and encourage new collaborations.

Prof. Grutter said that each student will be advised and mentored by an interdisciplinary supervisory committee. He further said that co-supervision is encouraged, but not mandated and that progress tracking and program compliance will be performed by the Graduate Program Director. He said that in order to become a supervisor, Faculty members would need to apply to the QLS committee who would then determine whether they are a good fit for quantitative life sciences.

Associate Dean Nilson said that, in terms of organizational structure, the Faculty overseeing this PhD program is Graduate & Postdoctoral Studies not the Faculty of Science and that this is in order to accommodate programs that lie between Faculties. She said the allocation of funds will be based on the number of students enrolled so that this program will have its own Graduate Funding budget. She said that one potential concern is whether this might compromise funding to existing programs in the Faculty, for example if, instead of new students, the QLS enrolment is comprised of students who would have otherwise enrolled in a Faculty of Science PhD program.

Prof. Palmer questioned whether it was appropriate for the Academic Committee to consider the funding and financing of this program rather than simply the program's structure and the courses included therein. Dean Lennox said that, while financing is an important part of his overall considerations, he was seeking academic advice from the committee.

Prof. Hales noted there was lots of reference to drug development but no Pharmacology courses and suggested perhaps a drug design course would be a good inclusion in this program. Prof. Grutter noted that the Complementary Courses list was not exclusive and was still at the draft stage. He said he welcomed more suggestions for courses.

Associate Dean Nilson asked how many credits the average student will take beyond the capstone course. Prof. Grutter said this largely depends on the students themselves and that they will be closely followed their supervisor(s) as they customize the program to their background and needs. Prof. Hendricks asked what would become of students who weren't sure whom they wanted to work with. Prof. Grutter said that applicants are required to provide a letter of interest so as to pair them with an appropriate mentor.

Prof. Paquette noted the omission of Earth Systems Sciences (ESYS) from Table 1: Enrollment in multidisciplinary undergraduate programs at McGill in quantitative life sciences. She said she will send the annual enrollment numbers to Prof. Grutter for their inclusion. Associate Dean Western commented that Table 1 was mislabeled as it currently stands as it covers all multidisciplinary programs not just those in quantitative life sciences and thus that descriptor at the end of the title should be removed. Finally, Associate Dean Nilson noted that students might need more than one month to select an advisory

committee if they will be doing research rotations and will therefore not have selected a supervisor by then, and suggested that the section of Advisory Committees therefore be revised.

Associate Dean Western **moved**, seconded by Prof. Palmer, that the Academic Committee accept the capstone course IQLS 600. **The motion carried unanimously.**

Associate Dean Western **moved**, seconded by Prof. Cumming, that the Academic Committee accept the Quantitative Life Sciences PhD program. **The motion carried unanimously.**

(5) NEUROSCIENCE

Associate Dean Western welcomed Prof. Cohen.

Major in Neuroscience **AC-16-21**

Prof. Cohen said that this program revision included the addition of relevant courses, the deletion of courses no longer offered and changes to ensure that different streams have access to relevant courses available in other streams.

Associate Dean Western **moved**, seconded by Professor Palmer, that the program revision be approved.

The motion carried.

Honours in Neuroscience **AC-16-22**

Prof. Cohen said that this program revision included both the addition of relevant courses and the deletion of courses no longer offered.

Associate Dean Western **moved**, seconded by Professor Palmer, that the program revision be approved.

The motion carried.

(6) ANATOMY & CELL BIOLOGY

ANAT 323	Neuroanatomy Title; Corequisite 3 credits	**AC-16-10**

Prof. Bui explained that ANAT 323 is primarily offered to PT/OT students, therefore the material focuses on clinical cases making the title change to Clinical Neuroanatomy necessary. He said this clinical approach is specific to this course and the students required to take it. Regarding the new ANAT 315 corequisite, Professor Bui said ANAT 315 is an existing prerequisite for PT/OT students and that there is thus a gap in knowledge among the students who have not taken or taking ANAT 315.

Associate Dean Western **moved**, seconded by Director Allard, that the course revision be approved.

The motion carried.

ANAT 365	Cellular Trafficking Description 3 credits	**AC-16-11**

Prof. Bui said that this course has evolved in its focus and format based on student feedback over the years and that, as such, a change in the course description is needed.

Associate Dean Western **moved**, seconded by Director Allard, that the course revision be approved.

The motion carried.

Major in Anatomy and Cell Biology **AC-16-12**

Prof. Bui said that BIOL 301 is a core required course in the program and as such should not also be listed as a complementary course.

Associate Dean Western **moved**, seconded by Director Allard, that the program revision be approved.

The motion carried.

Honours in Anatomy and Cell Biology **AC-16-13**

Prof. Bui said BIOL 301 and ANAT 432 are core required courses in the program and as such should not also be listed as complementary courses. He also said that since ANAT 315 is now a corequisite for complementary course ANAT 323, ANAT 315 should be added to the list of complementary courses.

Associate Dean Western **moved**, seconded by Director Allard, that the program revision be approved.

The motion carried.

(7) <u>ATMOSPHERIC & OCEANIC SCIENCES</u>

ATOC 404	Climate Physics New Course 3 credits	**AC-16-14**

Prof. Merlis said his department has long been considering a course on 1D climate to fill a gap between the 200-level sequence and the more math/physics intensive 500-level courses that primarily serve M.Sc. students. He said this course would also serve to increase the visibility of Atmospheric & Oceanic Sciences in the university at large, which resonates with McGill's new emphasis on sustainability and could very well be an optional course for students in the Earth System Science program. Additionally, Prof. Merlis said this course fits the Faculty's goal of more interdisciplinary courses, including courses co-listed in two departments. Finally, he said this course will be required for the ATOC Climate Science stream of the undergraduate Major and Honours programs.

Associate Dean Western **moved**, seconded by Professor Paquette, that the new course be approved.

The motion carried.

Major in Atmospheric Science **AC-16-15**

Prof. Merlis said the revision to the Major adds a new proposed course and adds to the list of complementary courses. The new proposed course is ATOC/PHYS 404 Climate

Physics and will be added to the complementary course list for three of the Streams of the Major and will be added as a required course for the Climate Science Stream, where it replaces MATH 203. In the proposed Major, MATH 203 is a complementary course across all streams. In addition, two ESYS courses (ESYS 300 and ESYS 301) have been added to the complementary course lists for three streams (Weather Analysis and Forecasting, Climate Science, and General), as these are appropriate for the Atmospheric Science major and distinct from other complementary courses.

Associate Dean Western **moved**, seconded by Professor Paquette, that the program revision be approved.

The motion carried.

Honours in Atmospheric Science **AC-16-16**

Prof. Merlis said the revision to the Honours program adds a new proposed course and adds to the list of complementary courses. The new proposed course is ATOC/PHYS 404 Climate Physics and will be added to the complementary course list for three of the Streams of the Major and will be added as a required course for the Climate Science Stream. In addition, two ESYS courses (ESYS 300 and ESYS 301) have been added to the complementary course lists for three streams, as these are appropriate for the Atmospheric Science major and distinct from other complementary courses.

Associate Dean Western **moved**, seconded by Professor Paquette, that the program revision be approved.

The motion carried.

Minor in Atmospheric Science **AC-16-17**

Prof. Merlis said the current Atmospheric Science Minor has limited flexibility with five required courses and only one complementary course. He said the proposed revision is intended to increase the flexibility of the Minor, so that students have a broader range of options that reflects the full range of course offerings by the Atmospheric & Oceanic Sciences department. The proposed Minor has one required course and the remaining five courses (15 credits) are complementary courses. The list of complementary courses has been expanded list by 10 additional courses. Finally, Prof. Merlis said the current Minor has certain required courses that are Complementary for the Major, while the proposed Minor program does not and that this has been corrected in the proposed Minor.

Associate Dean Western **moved**, seconded by Professor Paquette, that the program revision be approved.

The motion carried.

(8) <u>PHYSICS</u>

PHYS 404	Climate Physics New Course 3 credits	**AC-16-18**

Prof. Cumming said the Physics Department strongly supports this double prefix course. He said this course would introduce physics undergrads to climate and atmospheric science, which would serve as valuable background to those interested in pursuing planetary science or exoplanet graduate degrees after completing their undergraduate Physics degree.

Associate Dean Western **moved**, seconded by Professor Cumming, that the new course be approved.

The motion carried.

(9) CHEMISTRY

CHEM 557	Computer Modeling of Molecules & Materials New Course 3 credits	**AC-16-19**

Prof. Blum said computer modeling of molecular systems and materials is now routinely used in all branches of fundamental science – chemistry, physics, and materials science – but that there is currently no course offered at McGill that covers this material. She said this course was being proposed to give students a greater understanding of the structure of programming.

Associate Dean Western **moved**, seconded by Professor Blum, that the new course be approved as CHEM 505.

The motion carried.

(10) COMPUTER SCIENCE

COMP 550	Natural Language Processing New Course 3 credits	**AC-16-20**

Prof. Langer said that natural language processing is one of the main subareas of artificial intelligence, but there is currently no course in the Faculty of Science on this topic. While acknowledged that the Department of Linguistics offers a course on computational linguistics (LING 550) which focuses on linguistic analysis using computational techniques, he said that COMP 550 assumes significantly more computational background, and is aimed towards technological applications. He said this course will prepare students for graduate-level research in natural language processing, and give them the background to qualify for internship and job opportunities in this field in industry. Finally, he said this course has previously been offered as a topics course (COMP 599) with enrollment numbers of 39 in Fall 2015 and 44 in Fall 2016.

Associate Dean Western **moved**, seconded by Professor Langer, that the new course be approved.

The motion carried.

(11) BACHELOR OF ARTS & SCIENCE

Minor Concentration History and Philosophy of Science **AC-16-23**

Associate Dean Western said this revision instituted some housekeeping changes to update the program.

Associate Dean Western **moved**, seconded by Director Allard, that the program revision be approved.

The motion carried.

Major Concentration Political Science **AC-16-24**

Joint Honours Component Political Science **AC-16-25**
Minor Concentration Political Science **AC-16-26**

Associate Dean Western said these revisions served to clarify program requirements and formalize many of the permissions and explanations that advisors have been giving to students on an ad-hoc basis.

Associate Dean Western **moved**, seconded by Director Allard, that these three program revisions be approved.

The motion carried.

(12) <u>BIO-PHYSICAL SCIENCES UMBRELLA & ALIGNMENT EXERCISE</u> AC-16-27
For Information in advance of the 12/12/2016 Academic Committee meeting

Associate Dean Western informed the committee of that she has been working in conjunction with the Departments of Biology, Chemistry, Mathematics & Statistics, Physics, Physiology and the School of Computer Science to create an "umbrella framework" for undergraduate bio-physical sciences program. She said the goal of this umbrella structure is to bring together all integrative bio-physical science programs and that this includes the four current joint programs (i.e. Math-Biology, Biology-Computer Science, Physiology-Physics, and Physiology-Math) as well as the interdisciplinary departmental options (i.e. Biology-Quantitative Biology and the proposed Physics-Biophysics and Chemistry-Biophysical Chemistry). She said the proposal is to make explicit the courses these programs already share in order to streamline timetabling as well as to develop integrative courses to contribute to these programs to make them truly interdisciplinary. Finally, she said the programs would each continue to exist as streams (or pillars) within the umbrella structure, but with their shared portions identified and aligned so that students would more easily be able to choose and move between them. She said that students taking interdisciplinary biosciences have already begun identifying with one another by forming a grass-roots society known as the McGill Integrated Bioscience Society (MIBS).

Associate Dean Western said that she wanted to give the committee time to reflect before bringing the new courses, new programs and program revisions associated with this umbrella framework to the Academic Committee meeting of December 12, 2106. She listed the items as follows:

- Two new courses:
  - BIOL 219 - Physical Biology of the Cell (4 credits)
  - PHYS 329 - Statistical Physics with Biophysical Application (3 credits)
- Five revised programs:
  - Biology – Quantitative Biology (Major & Honours)
  - Biology & Mathematics (Major)
  - Computer Science & Biology (Major & Honours)
  - Physiology & Mathematics (Major)
  - Physiology & Physics (Major)
- Two new programs:
  - Chemistry – Biophysical Chemistry (Major & Honours)
  - Physics – Biological Physics (Major & Honours)

Dean Lennox encouraged committee members to send their questions and comments to Associate Dean Western. He said it was important to consider not only the course and program details but also the broader concepts behind integrating physical and life sciences programs. He said he hoped for a robust discussion as to whether and why this is something the Faculty of Science should pursue.

(13) SUS ACTIVITIES

Ms. Jasmine Leung, V.-P. (Academic Affairs), of the Science Undergraduate Society (SUS), informed the committee of a number of successful events the SUS has put on this semester. These include the 11th Annual Graduate and Professional Schools Fair in which 66 programs were represented and 553 students attended, the 1st Annual Wine & Cheese Networking Event for first-year students to be introduced to professors and other students in prospective majors and an undergraduate research information session with Mr. Chisholm of the Science Office of Undergraduate Research. She also noted that Academia Week planning was going well and on schedule to be held in the second week of February 2017. Finally, Ms. Leung noted that the SUS was in the process of coordinating a field trip for interested students to visit the Albany College of Pharmacy Vermont Campus.

(14) OTHER BUSINESS

There being no further business, the meeting adjourned at 4:25 p.m.