SENATE

NOTICE OF MEETING

March 9, 2018

Please be advised that the next regular meeting of Senate will be held on Friday, March 16, 2018, at 2 p.m., in the Norman D. Hébert, LLD Meeting Room (Room EV 2.260) on the SGW Campus.

Members of Senate who cannot attend are requested to notify Evelyne Loo as soon as possible at evelyne.loo@concordia.ca or ext. 4814. You may also contact Evelyne if you have any problems accessing the documents.

D. Tessier

Danielle Tessier
Secretary of Senate

AGENDA OF THE OPEN SESSION
OF THE MEETING OF SENATE

Held on Friday, March 16, 2018, at 2 p.m.
in the Norman D. Hébert, LLD Meeting Room
(Room EV 2.260) on the SGW Campus

Item		Presenter/s	Action
1.	Call to order	A. Shepard	
1.1	Adoption of the Agenda	A. Shepard	Approval
1.2	Adoption of January 19, 2018 Minutes	A. Shepard	Approval
2.	Business arising from the Minutes not included on the Agenda	A. Shepard	
3.	President's remarks	A. Shepard	Information
4.	Academic update *(Document US-2018-2-D1)*	G. Carr	Information
5.	Report of Standing Committees:	A. Shepard	Information
5.1	Academic Planning and Priorities *(Document US-2018-2-D2)*		
5.2	Finance *(Document US-2018-2-D3)*		
5.3	Library *(Document US-2018-2-D4)*		
5.4	Research *(Document US-2018-2-D5)*		
CONSENT AGENDA		A. Shepard	
6.	Amendment to composition of the Finance Committee (*Document US-2018-2-D6)*		Approval
7.	Academic Programs Committee: Report and recommendations *(Document US-2018-2-D7)*		Approval

7.1 Undergraduate curriculum changes – Faculty of Arts and Science
7.1.1 Department of Education *(Document US-2018-2-D8)*
7.1.2 Department of History *(Document US-2018-2-D9)*
7.1.3 Department of Physics *(Document US-2018-2-D10)*
7.1.4 School of Irish Studies *(Document US-2018-2-D11)*

7.2 Undergraduate curriculum changes – Faculty of Fine Arts - Mel Hoppenheim School of Cinema *(Document US-2018-2-D12)*

7.3 Graduate curriculum changes – Faculty of Arts and Science
7.3.1 Department of Journalism *(Document US-2018-2-D13)*
7.3.2 Department of Religions and Cultures *(Document US-2018-2-D14)*

7.4 Graduate curriculum changes – John Molson School of Business
7.4.1 Graduate Certificate in Business Administration *(Document US-2018-2-D16)*
7.4.2 Graduate Diploma in Business Administration *(Document US-2018-2-D17)*
7.4.3 Master of/Magisteriate in Business Administration (Executive Option) *(Document US-2018-2-D18)*
7.4.4 Master of/Magisteriate in Science in Marketing *(Document US-2018-2-D19)*

REGULAR AGENDA

8.	Academic Programs Committee: Report and recommendations *(Document US-2018-2-D7)*		
8.1	New graduate program – Faculty of Arts and Science and Faculty of Engineering and Computer – Department of Chemistry and Biochemistry, Department of Physics, Department of Building, Civil and Environmental Engineering, Department of Electrical and Computer Engineering, Department of Mechanical, Industrial and Aerospace Engineering – Master of/Magisteriate in Science (Nanoscience and Nanotechnology) / Master of/ Magisteriate in Applied Science (Nanoscience and Nanotechnology) *(Document US-2018-2-D15)*	P. Wood-Adams/ A. Asif/ A. Roy	Approval
9.	Clarification regarding the definition of "in good standing" *(Document US-2018-2-D20)*	P. Blais	Information

10. Question period *(maximum - 15 minutes)*

11. Other business — A. Shepard

12. Adjournment — A. Shepard

US-2018-1

MINUTES OF THE OPEN SESSION OF THE MEETING OF SENATE

Held on Friday, January 19, 2018, at 2 p.m.
in the Norman D. Hébert, LLD Meeting Room
(Room EV 2.260) on the SGW Campus

PRESENT

Voting members: Alan Shepard *(Chair)*; Mohamed Allalou; Paul Allen; Amir Asif; Reena Atanasiadis; Guylaine Beaudry; Pascale Biron; Patrice Blais; Rory Blaisdell; Steven Brown; Saul Carliner; Graham Carr; Mikaela Clark-Gardner; Frank Crooks; Anne-Marie Croteau; Ricardo Dal Farra; Christine DeWolf; Jill Didur; Charles Draimin; Rebecca Duclos; Marcie Frank; Vince Graziano; Brigitte Jaumard; Tevfik Karatop; David Morris; Mahesh Natarajan; Virginia Penhune; Justin Powlowski *(Acting on behalf of Christophe Guy)*; John Potvin; Martin Pugh; Omar Riaz; André Roy; Jonathan Roy; Francesca Scala; Yousef Shayan; Ali Sherra; Thufile Sirajudeen; Matt Soar; Robert Soroka; Marc Steinberg; Julia Sutera Sardo; Leyla Sutherland; Sofiène Tahar; Christopher Trueman; Paula Wood-Adams; Sharon Yonan Renold

Non-voting members: Joanne Beaudoin; Philippe Beauregard; Denis Cossette; Roger Côté; Bram Freedman; Emmet Henchey; Tom Hughes; Lisa Ostiguy

ABSENT

Voting members: Chiranjeevi Koduri; Lorraine Oades Harald Proppe; Daniel Salée; Shaumia Suntharalingam; Jean-Philippe Warren

Non-voting members: Isabel Dunnigan; Frederica Jacobs; Daniel Therrien

1. Call to order

The President called the meeting to order at 2:05 p.m.

1.1 Approval of Agenda

R-2018-1-1 *Upon motion duly moved and seconded, it was unanimously resolved that the Agenda of the Open Session be approved, with the addition of the President's Remarks as item 2.1 as well as a discussion regarding the sexual misconduct allegations as item 11.*

1.2 Approval of the Minutes of the Open Session meeting of December 8, 2017

R-2018-1-2 *Upon motion duly moved and seconded, it was unanimously resolved that the Minutes of the Open Session meeting of December 8, 2017 be approved.*

2. Business arising from the Minutes not included on the Agenda

There was no business arising from the Minutes not included on the Agenda.

2.1 President's remarks

The President's remarks are summarized as follows:

- He thanked those who attended the Meet & Greet held last week held on both campuses.
- The funeral service for Father Emmett Johns, a Loyola alumnus and honorary doctorate recipient, will be held on January 27 at Saint Patrick Basilica.
- The 2018 Teaching and Learning Winter Festival will begin on January 26.
- A delegation of 90 JMSB undergraduate students won gold at the 2018 Jeux du commerce.
- Prof. Adrian Tsang received a $6 million grant over three years from the Genomic Application Partnership Program to support his work in the development of an alternative to antibiotics in animal feed.
- Students can now sign up to the Navigator Program and get connected to the resources they need to succeed.
- Open House will be held on Saturday, February 10.
- The past few weeks have been difficult, trying to respond to allegations of sexual misconduct and their aftermath. He will say more during the discussion under item 11.

3. Academic update (Document US-2018-1-D1)

The Provost apprised of some other University projects and initiatives not included in his written report, including the following:

⇒ The appointment of Geneviève Sioui, effective January 22, as the new Coordinator, Indigenous Directions.
⇒ SHIFT, Concordia's social innovation hub, recently went live.
⇒ A series of new online hubs linked to the Strategic Directions website, including one on cities, has also gone live.
⇒ ENCS professor Anjali Agarwal has been invited to join a panel for this upcoming Canadian Senate Open Caucus on Women and Girls in Science, Technology, Engineering and Mathematics (STEM).

4. Report of Standing Committees

4.1 Finance (Document US-2018-1-D2)

Pursuant to comments and questions in relation to the structure of eConcordia, KnowledgeOne and their relationship with the University, Prof. Shepard replied that he could bring the suggestion of a presentation on that subject for consideration at a subsequent meeting of Steering Committee. He added that the demand for online courses continues to rise and explained that net revenues come back to the University.

4.2 Library (Document US-2018-1-D3)

No questions were asked in connection with this report.

CONSENT

5. Committee appointments (Document US-2018-1-4)

R-2018-1-3 That the committee appointments, outlined in Document US-2018-1-D4, be approved.

6. Academic Programs Committee: Report and recommendations (Document US-2018-1-D5)

6.1 Undergraduate curriculum changes – Faculty of Engineering and Computer Science (Document US-2018-1-D6)

R-2018-1-4 That the undergraduate curriculum changes in the Faculty of Engineering and Computer Science, outlined in Document US-2018-1-D6 be approved, as recommended by the Academic Programs Committee in Document US-2018-1-D5.

6.2 Graduate curriculum changes – Faculty of Engineering and Computer Science (Document US-2018-1-D11)

R-2018-1-5 That the graduate curriculum changes in the Faculty of Engineering and Computer Science, outlined in Document US-2018-1-D11-be approved, as recommended by the Academic Programs Committee in Document US-2018-1-D5.

REGULAR

7. Academic Programs Committee: Report and recommendations (Document US-2018-1-D5)

7.1. New graduate programs – Faculty of Engineering and Computer – Department of Chemical and Materials Engineering

7.1.1 Graduate Certificate in Chemical Engineering (Document US-2018-1-D7)

7.1.2 Graduate Diploma in Chemical Engineering (Document US-2018-1-D8)

7.1.3 Master of/Magisteriate in Applied Science (Chemical Engineering) (Document US-2018-1-D9)

7.1.4 Doctor of/Doctorate in Philosophy (Chemical Engineering) (Document US-2018-1-D10)

Dean Wood-Adams introduced the four new programs in the Department of Chemical and Materials Engineering which was established eight month ago. Dean Asif added that these new programs have the full support of ENCS and essentially complete the entire spectrum of core programs that a faculty of engineering should offer.

Department Chair Alex de Visscher presented the highlights of the four new programs, noting that in the future a fifth course-based Master's program could be offered. He also said that over time the Graduate Certificate could be offered online. Pending Senate's approval today, the Certificate and Diploma will be offered as of Fall 2018, while the Master's and PhD will require approval of the Bureau de coopération interuniversitaire (BCI) and are expected to be offered as of Fall 2019.

In response to the comments included in the Finance Committee report filed under Document US-2018-1-D2 of today's meeting, Dean Asif said that the budget includes a 10% attrition rate each year, and that no costing reduction is foreseen in the Mechanical Engineering graduate programs due to the introduction of proposed programs in Chemical and Materials Engineering. The demand for Mechanical Engineering graduate programs remains high.

R-2018-1-6 *Upon motion duly moved and seconded, it was unanimously resolved that the graduate programs in the Faculty of Engineering and Computer Science, outlined in Documents US-2018-1-D7 to D10, be approved, as recommended by the Academic Programs Committee in Document US-2018-1-D5.*

8. Research Committee recommendation regarding Equity, Diversity and Inclusion Action Plan (Document US-2018-1-D12)

Presenting on behalf of Dr. Guy, Dr. Powlowski provided the highlights of the Equity, Diversity and Including Plan (EDI), which is required by the Canada Research Chairs (CRC) Secretariat for institutions with five or more chair allocations in order to guide institutional efforts in increasing the participation of individuals from the four designated groups (FDGs) – women, persons with disabilities, aboriginal peoples and members of visible minorities. The EDI is a shared undertaking of the Offices of the Vice-President, Research and the Provost.

It contains 15 key actions, comprised of both short- and long-term goals. A report on the progress made in meeting the EDI objectives will be required on October 31. Key stakeholders were consulted in the preparation of the plan. The draft recommended for approval by the Research Committee has received input and feedback by the University Research Committee and the Academic Cabinet.

Prof. Allen expressed a concern that the person occupying the position of Senior Lead, Equity and Diversity is a non- academic. Dr. Carr responded that Dr. Villacorta has a

PhD and will provide expertise as a resource person for all academic hiring, specifying that the position is not a voting member of the committee.

R-2018-1-7 *Upon motion duly moved and seconded, it was unanimously resolved that Senate approve Concordia University's Equity, Diversity and Inclusion (EDI) Action Plan for the Canada Research Chairs (CRC) Program, outlined in Document US-2018-1-D12.*

9. Emeritus status for retiring librarian (Document US-2018-1-D13)

Dr. Beaudry recalled that in March 2001 Senate approved the awarding of the emeritus status for all faculty members retiring in good standing. At Concordia, librarians are members of the academic staff and are appointed with ranks that parallel those of professors: assistant librarian, associate librarian, and senior librarian. Upon retirement, however, they are not awarded emeritus status even though they may continue to work on projects and research related to the University and serve on committees in a professional capacity.

Dr. Beaudry noted that other universities confer emeritus status to librarians upon retirement and opined that Concordia librarians, as members of the academic staff, should also be given the designation "Librarian Emeritus/Emeritae", specifying that the designation will be honorific only and will not have any other privileges associated with it.

Me Blais made the point that the term "in good standing" should be clarified.

R-2018-1-8 *Upon motion duly moved and seconded, it was unanimously resolved:*

That Senate approves the awarding to all librarians retiring from Concordia University in good standing a title testifying to the holder's professional relationship with the University; and

That the designation be [rank at the time of their retirement] Emeritus/Emeritae (ex: Senior Librarian Emeritus, Associate Librarian Emeritus).

10. Presentation by public scholars

Dean Wood-Adams provided the background of the public scholars program which was launched last year. The first cohort is comprised of ten doctoral students who receive $10,000 over three terms. The second cohort was chosen in December 2017.

The program was developed in partnership with the *Montreal Gazette* to showcase the value that graduate students bring to Montreal and the world. Ten highly qualified PhD students were selected across our four faculties. They receive training in writing of opinion editorials, philanthropy, government relations, communications and social media to enable them to connect and share their knowledge with the wider community. Dean Wood-Adams shared some of the blogs and social media as well as a sampling of the opinion editorials.

Lucas Hof (mechanical engineering) and Nadia Naffi (educational technology), two current scholars, presented a summary of their research as well as their contributions to the program.

11. Sexual misconduct allegations

Referring to recent public statements, a press conference and a number of past and current allegations regarding sexual misconduct in the Creative Writing Program, President Shepard assured Senate that those allegations are taken seriously and apologized for the anguish and pain that were reported.

While some allegations are historical and some more recent, the University's investigation must be conducted under a legal framework which provides for due process, confidentiality and privacy. He made the point that he is not trying to hide anything but rather to protect the rights of all involved. Under his leadership, his team has worked very hard to put in place appropriate mechanisms, such as the creation of the Sexual Assault Resource Centre in 2013, which continues to be an important part of the safety network. A number of policies were reviewed in 2014, which led to the adoption in 2016 of the stand-alone *Policy regarding Sexual Violence*. In 2017, the Quebec government did its own review and adopted Law 151 specific to universities, which was largely based on the work done at Concordia. The Office of Rights and Responsibilities also has a robust process.

Prof. Shepard added that guidelines regarding intimate relationships between students and faculty were finalized recently in light of Bill 151 and were to be disseminated in a few weeks but their roll-out will be accelerated given the circumstances.

The President summarized the three steps announced at the press conference:

1- Investigating the allegations using an external investigator;
2- Conducting a climate review of the Department of English; and
3- Launching a University-wide task force to review our current environment. This will be led by Lisa Ostiguy and Nadia Hardy and composed of students, faculty and staff.

He reiterated his sadness and anger about the reported allegations, noting that the University is taking all the steps to correct the situation but must be mindful that it cannot proceed on rumors or innuendoes and without formal complaints.

A discussion ensued, during which Senators provided their comments and concerns, summarized as follows:

- The University should not only focus on academics but also on intellect to help students evolve. The administration needs to listen to students about what they want and need.

- Some students do not feel listened to or supported. There is an internal failure on the part of the administration. Only one formal complaint has been filed. What counts as evidence? Students have been dissuaded not to go forward, and issues have not been acknowledged. The problem is ongoing, not historical. How can students trust the administration? The administration needs to apologize to students who have come forward.

- At its last Council meeting, the Arts and Science Federation of Associations (ASFA) established its own task force to assess both internal responses to this ongoing situation and the University environment to propose any recommendations they see fit through their own consultations.

- A list of requests to the administration from the Concordia Association for Students in English (CASE) was read, summarized as follows:

  - Acknowledge that the concerns were brought up in 2015 following the publication of an article written by Emma Healey regarding the climate of the Creative Writing Program and apologize for their subsequent dismissal.
  - Be transparent about the third-party conducting the investigation.
  - Facilitate a clear line of communication between students and the investigative third-party.
  - Clarify what constitute legitimate and defensible evidence.
  - Hire student-approved, third-party organizations to provide survivor-oriented support to affected Concordia students and alumni.
  - Revise the current policy regarding personal relationships between faculty members and students to account for possible risks of impropriety.
  - Prior to faculty members offering personal support to students, require students be made aware that faculty members have access to institutionalized legal recourse that students do not.
  - As problematic faculty have taught courses in both the Professional Writing and Literature streams, keep all English students informed and involved.
  - Remove the Matrix Magazine from the Concordia campus.

- CASE members and other students in the Faculty of Arts and Science do not trust the University procedures, because of the power dynamic and the concern that their experiences will be denounced or ignored. There is a fear within the student body of the asymmetric power imbalances in the University, and students are afraid to come forward because of it.

- Has conversations with hundreds of students each year in his capacity of student advocate. There is a perception among some students that the University is incapable, unwilling, or does not care. Complaints brought to the Office of Rights and Responsibilities or to Faculties/Departments do not get resolved or do not result in concrete outcomes. Involvement of the Human Resources Department does not help. Contrary to infringements to the Academic Code of Conduct, there is no clear process. There is a lack of data or formal record, which drives students further away from the process.

- The negative power dynamic is a key element. The majority of incidents occur in academic spaces. This climate allows the misconduct to occur and the review should address this aspect.

- There are not just a few bad apples. We need to fix and address the conditions that allow those bad apples to exist.

- Reporting is difficult in itself. Having more and clearer signage to key offices would be helpful.

- There is a need for mandatory training for faculty members at orientation. Mandatory orientation and training on this topic should be done in person and not online.

- Deals with disciplinary issues. Cases are reported for which there are consequences, but we do not hear about those cases.

- Concerns were raised about a lack of transparency of the proposed process, that repeated demands by students for involvement in the process are being ignored, that students should participate in the selection of the investigator, that more details about the process are necessary for it to be meaningful, that the projected timeline of May-June for the report is vague.

Responding to the first item of the CASE statement read earlier on, Dean Roy indicated that the administrative response at the Department and Faculty level was swift after receiving the letter in 2015. The matter was treated very seriously. The students' concerns were heard, and advice and support was provided to them, including informing them of their rights and the process to file a complaint, encouraging them to contact the Office of Rights and Responsibilities and offering accompaniment by the Department Chair if they wished to file a complaint.

Dean Roy added that the process was conducted with the utmost respect for the confidentiality requested by the students. Measures were taken in the Department to address the concerns. The letter was not shared with the Provost or the President.

Me Sullivan noted that extreme care is exercised in choosing the investigator and that the selection process and the name of the chosen investigator are confidential in order not to compromise the confidentiality of the investigation. She added that in the past Dr. Ostiguy and she have co-chaired working groups on various policies, which always include student participation.

The President reiterated that students will be full participants in the process and that the following actions are important:

1. Establishing mandatory orientation and training for faculty and staff regarding the University's policies and guidelines on sexual misconduct.

2. Improving overall communication on existing policies and resources.
3. Putting in place a system to facilitate and preserve a formal record of incidents, even if they do not result in a formal complaint.

Dr. Ostiguy noted that Me Sullivan and she are looking into task forces set up at other universities and will communicate the University's task force mandate in due course.

12. Question period

No questions were posed.

13. Other business

There was no other business to bring before Senate.

14. Adjournment

The meeting adjourned at 4:43 p.m.

D. Tessier

Danielle Tessier
Secretary of Senate

Internal Memorandum

To: Members of Senate
From: Graham Carr, Provost and Vice-President, Academic Affairs
Date: March 7, 2018
Re: Academic Update

Concordia's Winter 2018 Open House and Portfolio Day took place on February 10. Over 4000 visitors turned up to learn more about Concordia and even apply on the spot. The Portfolio Day refers to workshops that were held to allow future fine arts students to get guidance on putting together a portfolio. This year, the Concordia recruitment team also offered participants rides for those travelling from Quebec City and Gatineau by organizing a charter bus service. The service was a well received and allowed for broader participation. Thank you to all of the faculty, students and staff who participated in Open House, and congratulations to the recruitment team for a great event!

Concordia has joined a Canada-wide AI supercluster that will help bolster Canada's leadership in artificial intelligence (AI). SCALE.AI, the AI-Powered Supply Chain Supercluster is one of only five projects that received funding last month from the Government of Canada, as part of its new $950 million Innovation Superclusters Initiative. Led by the Institute for Data Valorization (IVADO) in Montreal and the University of Waterloo, the Quebec-based SCALE.AI will focus on defining a global supply chain platform that will boost artificial intelligence and data science in Canada. Concordia is one of almost 120 industrial partners, world-class research institutions and other organizations that have joined forces to create this Canadian industry-led innovation consortium, and will both contribute research capacity to the supercluster and develop research-based training opportunities for our graduate students.

On February 16, a team of students representing JMSB won the local CFA (Chartered Financial Analyst) Challenge. The winner from each local competition advances to one of the three regional competitions, with the winner from each regional competition advancing to the global final. The CFA Institute Research Challenge is an annual global competition that provides university students with hands-on mentoring and intensive training in financial analysis. Students work in teams to research and analyze a publicly traded company – sometimes even meeting face-to-face with company management. Each team writes a research report on their assigned company with a buy, sell, or hold recommendation and may be asked to present and defend their analysis to a panel of industry professionals.

After a successful inaugural year, Concordia's Public Scholars program is back with a brand-new cohort of 10 PhD researchers. The program was designed with the *Montreal Gazette* to bridge the gap between academic research and the community. It is now part of Concordia's key initiatives to support its strategic directions for a next-generation university. The new team of graduate students will be representatives of the university's exciting new research. They will receive

extensive training in social media, government relations, op-ed writing and public speaking. The 10 students come from all four Faculties and have already been quite active in the community.

The Concordia community and general public are invited to join our first cohort of Public Scholars for an evening of short talks that promise thought-provoking reflection, investigation and discovery. These researchers will each have five minutes to tell you how their work will impact our future. The talks will be followed by a reception where guests can continue the conversation with the presenters. The event is part of Concordia's *Thinking Out Loud* lecture series, presented in partnership with the *Montreal Gazette*, and will take place on March 20 from 6:30 to 8 p.m. in the D.B. Clarke Theatre.

Younes Medkour, a PhD candidate (Biology) and a 2018 Public Scholar, and Lucas Hof, a PhD student (Mechanical, Industrial and Aerospace Engineering) and a 2017 Public Scholar, were longlisted for NSERC's Science, Action! video competition. In the first round, 25 videos with the most views will be announced on March 12. From those, 15 finalists chosen will win cash prizes and be featured as part of museum exhibits and science fairs, and during Science Odyssey and Science Literacy Week. Younes' video "The Fountain of Youth" features his aging research and his quest to increase the human lifespan and delay the onset of age-related diseases. Lucas' animated video, "Manufacturing the Future," features the glass micro-machining technology he has developed alongside his colleagues at Concordia's Electrochemical Green Engineering Group, and it was produced by Ruiting Ji, a third-year undergraduate student (Mel Hoppenheim School of Cinema).

For the fifth consecutive year, a John Molson School of Business student was among the finalists in Odgers Berndtson's annual CEO for a Day competition which matches Canadian undergraduate students with CEOs and gives finalists the opportunity to spend a day shadowing a Canadian business leader. On February 14, Lucrezia Sciascia spent the day with Mélanie Dunn, the CEO of the marketing and communications agency, Cossette.

Alex Shaheed, a student in the Masters in Public Policy and Public Administration Program, was one of five finalists in the National Student Paper Competition run by the Institute of Public Administration and the Canada School of Public Service (CSPS). His essay, "Crowdsourced Communications: My idea to help ensure that the public service will be ready to meet the needs of the future," proposes innovative ways to create opportunities for post-secondary students to contribute to democratic governance. Alex's idea of crowdsourced communications taps into a model of incentive-based competitions. He suggests government agencies organize a series of contests challenging Canadian post-secondary students to repurpose the core messages contained in public-sector documents. His paper is currently being translated and will be posted on CSPS' website.

From February 18 to 24, JMSB hosted the 10th annual student-run John Molson Undergraduate Case Competition. The world's largest international business undergraduate case competition, the event pits 96 students from 24 of the world's top business schools against each other. The organizing team of 10 students from the John Molson School of Business (JMSB) was responsible for every aspect of the program, including logistics and corporate sponsorship. They were supported by 48 volunteers and more than 100 judges, members of the business community. First place was won by the team from Chulalongkorn University from Thailand.

The Three Minute Thesis and Project competition is an annual, international event that challenges graduate students to present their research in easy-to-understand terms to a non-specialist audience. Participants present a clear, concise and engaging presentation of their work in a total of three minutes, with no props and only one non-animated PowerPoint slide. Two of our students will be selected to represent Concordia at the 3MT Eastern Canada Regional Competition at McGill and at the *Ma Thèse en 180 seconds* competition at the ACFAS congrès hosted by Université du Québec à Chicoutimi in May. This year's competition final, hosted by GradProSkills, will be held on March 15 in MB 9 and is open to all.

On April 16 in MB 9A, the School of Graduate Studies will host a second Conflict Resolution, Graduate Supervision and Mentoring Day, a half-day of activities aimed at promoting excellence in graduate supervision. Our speakers and animators include Ann English, professor of Chemistry and Biochemistry, and Concordia's recipient of the 2017-18 Award for Graduate Mentoring; Amy Fish, Concordia University Ombudsperson; and Anthony Paré, author of *Re-thinking the dissertation and doctoral supervision*. The morning will be interactive and hosted by Paula Wood-Adams, Dean of Graduate Studies. Registration is ongoing and places can be held in advance by emailing sgs.rsvp@concordia.ca.

ACADEMIC PLANNING AND PRIORITIES COMMITTEE
REPORT TO SENATE
Dr. Graham Carr
March 16, 2018

The Academic Planning and Priorities Committee met on February 5, 2018.

The Academic Planning and Priorities committee met on February 5, 2018. Prof. Anne Whitelaw, Vice-Provost, Planning and Positioning gave a presentation on Strategic Enrolment Management. She gave an overview of the new initiative and sought feedback from the committee on how to engage the Concordia community on the development of a strategic enrolment plan for Concordia.

SENATE FINANCE COMMITTEE
REPORT TO SENATE
March 16, 2018

The meeting of the Senate Finance Committee (SFC) was held on February 16, 2018. There were two items on the agenda, eConcordia and the Audited Financial Statement.

eConcordia

This item was carried forward from the previous meeting as the Chair received an email from the Vice-Provost, Innovation in Teaching and Learning, which clarified the responsibilities of her office and that of the Concordia University Digital Strategy Steering Committee. The Vice-Provost, Dr. Gabriele, in conjunction with eConcordia, determines which courses will be developed and when they will be offered. The Digital Strategy Steering Committee reports to Dr. Beaudry, Vice-Provost, Digital Strategy and University Librarian, and will help to develop a comprehensive digital strategy for the whole University. There has been a recent call for input on this development.

Jonathan Levinson, Executive Director, Institutional Planning and Analysis, also provided more precise statistics on eConcordia. Currently, there are 55 distinct online courses offered in 67 sections with 32,479 yearly registrations.

Audited Financial Statement

Denis Cossette, the Chief Financial Officer of the University, gave the members of the SFC a comprehensive briefing on the Audited Financial statement of the University dated April 30, 2017. The Auditors bring the statement to the Audit Committee of the Board, which recommends its approval to the Board of Governors. It should be noted that Concordia's audited financial statements for the last 10 years are available on the web.

REPORT TO SENATE
FROM THE
LIBRARY COMMITTEE

(Senate Meeting – March 16, 2018)

The second meeting of the LC for the academic year was held on February 7, 2018.

1. General Information

- On Friday, March 23rd, from 11:00 am – 1:00 p.m., the Library will celebrate the end of the Webster Library transformation which debuted in 2015. The grand re-opening will be marked with the presence of Hélène David, Quebec Minister for Higher Education. Tours of the new technology sandbox and visualization room, a silent disco performed by theater students, and refreshments are some of the planned activities for this special occasion.

- On Thursday, January 25th, the Webster Library held a vernissage of the newly installed exhibition, *Remembering Expo 67*. The exhibition's curator, Professor Johanne Sloan made a presentation to a well-attended audience. The unique textual documents and objects are on display in the vitrine on the second floor of the library.

- Since the Fall of 2014, Quebec's 18 university libraries are proposing to implement a Shared Library Services Platform to replace the ten Integrated Library Management Systems (ILS) they use in order to maximize sharing opportunities, while reducing the duplication of activities without institutional added value.

2. Presentation on Collection Services Update 2017/18

Ms. Pat Riva, Associate University Librarian, Collection Services, gave a report on the library collections budget. She presented the final figures for revenues and expenditures for the 2016/17 fiscal year, and the projected revenues for the current year 2017/18. FY17 was the first year under the new budget model that separates capital budget from the non-capital (operating) budget. This budget model was in planning throughout the year and was actually implemented at the end of the year. Collection Services has had to reassess many of its processes and adapt to always take into account whether a purchase is to be from capital or no-capital funds. The final results for FY17 were favourable for the capital portion of the budget, allowing new capital resources to be purchased in late 2017. These new resources include online reference works, journals and proceedings, retrospective ebook packages, online video collections, and digitized archival collections. Additionally, the Library was able to purchase the most recent JSTOR journal collections, and commit to purchasing annually 15 ebook packages that had been purchased regularly through the Academic Plan funds.

Collections Funding 2016/17
By Source of Revenue

Capital Budget	$4,300,000
Operating (non-capital) Budget	$1,600,000
Frais indirects	$584,271
Endowment & Special Funds	$227,614
Additional Library Funding	$96,953
Lost books replacements	$16,978
Better World Books (sale of duplicates)	$2,883
TOTAL for FY 2016/17:	$6,828,699

Collections Expenditures 2016/17
By Type of Material Purchased

Online Resources (leased—non-capital)	$2,190,517
Online Journals & Databases (purchased)	$2,897,489
Print Journals	$227,885
E-Books (packages and individual titles)	$559,998
Print Books	$576,849
Media materials (DVDs, CDs, etc.)	$57,610
Lehmann Bookbinding	$17,288
TOTAL for FY 2016/17:	$6,527,636

Respectfully submitted,
Dr. Guylaine Beaudry
Vice-Provost, Digital Strategy and University Librarian
February 28, 2018

RESEARCH COMMITTEE
REPORT TO SENATE
Dr. Christophe GUY (Chair)
March 16, 2018

Meeting of February 16, 2018

1. **Modifications to *Procedures for Research Units and Infrastructure Platforms* (for VPRGS-8 - *Policy on Research Units and Infrastructure Platforms*)**
   Committee members reviewed and approved the proposed modifications to the *Procedures for Research Units and Infrastructure Platforms*. These will now be forwarded to the Faculty Deans for their final approval.

2. **Research Unit Renewals**
   The Committee reviewed the renewal dossiers received from:
   - Centre for Microscopy and Cellular Imaging (CMCI)- *Established Infrastructure Platform – Renewal for 6 years*
   - Centre for Oral History and Digital Storytelling (COHDS) - *Established Research Centre (with an Established Infrastructure Platform) – Renewal for 6 years*
   - Centre for the Study of Learning and Performance (CSLP) – *Established Research Centre (with an Established Infrastructure Platform) – Renewal for 6 years*
   - Centre for Zero Energy Building Studies (CZEBS) - *Established Research Centre (with an Established Infrastructure Platform) – Renewal for 6 years*
   - Hexagram Concordia – Centre for Research-Creation in Media Art and Technology - *Established Research Centre (with an Established Infrastructure Platform) – Renewal for 6 years*
   - Technoculture, Art and Games Research Centre (TAG) - *Established Research Centre– Renewal for 6 years*

   Committee members agreed that the six above-mentioned units met the renewal criteria outlined in the *Policy on Research Units and Infrastructure Platforms* (VPRGS-8) and "under the authority of Senate, through the Senate Research Committee", unanimously approved the renewal of **University-recognized status** for six years.

US-2018-2-D6

SENATE
OPEN SESSION
Meeting of March 16 2018

AGENDA ITEM: Amendment to the composition of the Finance Committee

ACTION REQUIRED: For approval

SUMMARY: Senate approval is sought to amend the composition of the Finance Committee to replace the position of Vice-Provost, Faculty Relations by that of Vice-Provost, Planning and Positioning.

BACKGROUND: The current composition of the Finance Committee includes the Vice-Provost, Faculty Relations as an ex-officio, non-voting member.

The mandate of the Vice-Provost, Planning and Positioning is better aligned with the mandate of the Finance Committee. It is therefore proposed to substitute the position of Vice-Provost, Planning and Positioning for that of Vice-Provost, Faculty Relations as a non-voting member of the Finance Committee.

DRAFT MOTION: That, on recommendation of Steering Committee, the membership of the Finance Committee be amended by substituting the position of Vice-Provost, Planning and Positioning for that of Vice-Provost, Faculty Relations as a non-voting member.

PREPARED BY:

Name: Danielle Tessier
Date: February 20, 2018

UNIVERSITÉ Concordia UNIVERSITY

US-2018-2-D7

ACADEMIC PROGRAMS COMMITTEE
REPORT TO SENATE
Sandra Gabriele, PhD
March 16, 2018

The Academic Programs Committee requests that Senate consider the following undergraduate changes for the 2019-20 Undergraduate Calendar:

Following approval of Faculty Councils, on **February 22, 2018** APC members reviewed the undergraduate curriculum submissions from the Faculties of Arts and Science and Fine Arts. As a result of discussions APC resolved that the following undergraduate curriculum proposals be forwarded to Senate for approval:

Faculty of Arts and Science

Department of Education (For September 2018 Implementation) **(US-2018-2-D8)**
[The proposal involves updating two course titles and descriptions.]
• BA Major in Child Studies
• Courses

Department of History (For September 2018 Implementation) **(US-2018-2-D9)**
[The proposal involves updating course titles, notes and a course description, converting five slot courses to permanent offerings, and updating the lists of electives for the programs.]
• BA Honours in History, Public History with Internship Option
• Minor in Law and Society
• Course Offerings
• Requirements

Department of Physics (For May 2019 Implementation) **(US-2018-2-D10)**
[The proposal involves introducing two new laboratory courses and subsequently updating the prerequisites of two research courses, and the course lists for the programs.]
• Core Program
• BSc Honours in Physics (Concentration in Physics and Concentration in Biophysics)
• BSc Specialization in Physics (Option A Physics and Option B Biophysics)
• Courses
• Requirements

School of Irish Studies (For May 2018 Implementation) **(US-2018-2-D11)**
[The proposal involves renaming three programs by removing "Canadian" from the "Canadian Irish Studies" titles, updating course titles and descriptions, converting two slot courses to permanent offerings, and updating a list of electives for a program.]
• BA Major in Irish Studies – Program Name Change
• Minor in Irish Studies – Program Name Change
• Certificate in Irish Studies – Program Name Change
• Course Offerings
• Requirements

Faculty of Fine Arts

Mel Hoppenheim School of Cinema (For September 2018 Implementation) **(US-2018-2-D12)**

[The proposal involves revising two course titles and descriptions, and updating a list of electives for a program.]
• BFA Specialization in Film Studies
• Course Offerings
• Requirements

The Academic Programs Committee requests that Senate consider the following graduate changes for the Fall 2018 Graduate Calendar[1]:

Following approval of Faculty Councils, the Graduate Curriculum Committee, and the Council of the School of Graduate Studies for applicable proposals, on **February 22, 2018** APC members reviewed the graduate curriculum submissions from the Faculties of Arts and Science, Engineering and Computer Science and the John Molson School of Business. As a result of discussions APC resolved that the following graduate curriculum proposals be forwarded to Senate for approval:

Faculty of Arts and Science
Department of Journalism (For Fall 2018 Implementation) **(US-2018-2-D13)**
[The proposal involves introducing a new course and updating a list of electives and a related note for a program.]
• Master of/Magisteriate in Arts (Digital Innovation in Journalism Studies)
• Course Offerings
• Requirements

Department of Religions and Cultures (For Fall 2018 Implementation) **(US-2018-2-D14)** *[The proposal involves editorial updates and revising the topics title of a group of courses.]*
• Doctor of/Doctorate in Philosophy (Religion)
• Editorial
• Requirements

Faculty of Arts and Science and Faculty of Engineering and Computer Science
Departments of Chemistry and Biochemistry; Physics; Building, Civil and Environmental Engineering; Electrical and Computer Engineering; Mechanical, Industrial and Aerospace Engineering
(US-2018-2-D15)
[The proposal involves creating a new program.]
• Master of/Magisteriate in Science (Nanoscience and Nanotechnology) / Master of/Magisteriate in Applied Science (Nanoscience and Nanotechnology) - **New Program**

John Molson School of Business
(For Fall 2018 Implementation) **(US-2018-2-D16)**
[The proposal involves decreasing the required core courses by three credits and introducing a three-credit elective course option.]
• Graduate Certificate in Business Administration
• Courses
• Course Offerings
• Requirements

[1] New programs requiring MEES approval shall be included in the relevant calendar upon final approval.

(For Fall 2018 Implementation) **(US-2018-2-D17)**
[The proposal involves introducing five special topics courses and converting two slot courses to permanent offerings.]
• Graduate Diploma in Business Administration
• Course Offerings
• Requirements

(For Fall 2018 Implementation) **(US-2018-2-D18)**
[The proposal involves combining two courses into one by deleting two courses and creating a new one, and revising a course title and description.]
• Master of/Magisteriate in Business Administration (Executive Option)
• Courses
• Requirements

(For Fall 2018 Implementation) **(US-2018-2-D19)**
[The proposal involves converting six slot courses to permanent offerings and updating the titles and notes of two courses.]
• Master of/Magisteriate in Science in Marketing
• Course Offerings
• Requirements

Sandra Gabriele, PhD
Vice-Provost, Innovation in Teaching and Learning
February 28, 2017

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning
Office of the Provost and Vice-President, Academic Affairs
Chair, Academic Programs Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: January 30, 2018

SUBJECT: 2019-20 Undergraduate Calendar Curriculum Changes
Department of Education
EDUC-33
Title and course description changes to EDUC 460, 461

The Arts and Science Faculty Council has reviewed and approved the following proposal and requests that it be considered at the next meeting of APC.

The **Department of Education** is modifying the course titles and descriptions for EDUC 460 *Child Studies Field Experience: Early Childhood Settings* and EDUC 461 *Child Studies Seminar: Early Childhood Settings.* These changes more clearly define early childhood as the ages 0 to 5 to "meet the directives of the Ministère de la Famille et des Ainés".

Thank you for your consideration of this proposal for which there are no additional resource implications.

Reference documents:
FCC 2017.2/U_EDUC-33
ASFC 2018-1M-C

Department of Education

EDUC-33

Memo from Interim Chair

Title and Course Description Change

EDUC 460 *Child Studies Field Experience: Early Childhood Settings*

EDUC 461 *Child Studies Seminar: Early Childhood Settings*

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Paul Joyce
Associate Dean, Academic Programs

FROM: Saul Carliner
Interim Chair, Department of Education

DATE: November 13, 2017

SUBJECT: **EDUC-33: EDUC 460 and EDUC 461, BA Child Studies Curriculum Changes**

Would you please consider the attached dossier (EDUC-33), which was approved at the November 8, 2017 Department of Education Council meeting, with the following modifications to the courses EDUC 460 and EDUC 461: title and course description changes to clarify that the field placement settings are limited to early childhood settings (children ages 0 to 5 years), to meet the directives of the Ministère de la Famille et des Ainés.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **EDUC-33** VERSION: 5

COURSE CHANGE: EDUC 460 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: Education
Program: Major in Child Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.090

Type of Change:

[ ] Course Number	[X] Course Title	[ ] Credit Value	[ ] Prerequisite
[X] Course Description	[ ] Editorial	[ ] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 2018/2019) calendar	**Proposed Text**
EDUC 460 ***Child Studies Field Experience: Childhood Settings*** (3 credits) Prerequisite: Enrolment in Major in Child Studies; EDUC 302; EDUC 304 or 406; EDUC 461 concurrently. Students develop skills in observation and in planning curriculum for children in childhood settings. Students are required to ~~participate~~ in a field placement one day per week, for a total of 60 hours in ~~settings such as~~ child care centres~~, after-school programs, recreation~~ centres~~, libraries, museums, fine art~~ centres ~~or community organizations~~. *NOTE: Students who have received credit for EDUC 374 may not take this course for credit.*	**EDUC 460** ***Child Studies Field Experience: Early Childhood Settings*** (3 credits) Prerequisite: Enrolment in Major in Child Studies; EDUC 302; EDUC 304 or 406; EDUC 461 concurrently. Students develop skills in observation and in planning curriculum for children in early childhood settings. Students are required to complete a field placement for two half-days or one full-day per week, for a total of 60 hours, in a centre-based child care or preschool setting for children ages 0 to 5 years. *NOTE: Students who have received credit for EDUC 374 may not take this course for credit.*

Rationale:
Modification of the course title and course description to clarify that the field placement settings are limited to early childhood settings (children ages 0 to 5 years), in order to meet the directives of the Ministère de la Famille et des Ainés. The term, "0 to 5 years", reflects the exact wording used by the Ministère de la Famille et des Ainés. The option of two half-days allows for flexibility, in the event that a student does not have a full-day for Field Placement due to other courses/scheduling conflict.

Resource Implications:
None

Other Programs within which course is listed:

None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **EDUC-33** VERSION: 5

COURSE CHANGE: EDUC 461 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: Education
Program: Major in Child Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.090

Type of Change:

[ ] Course Number	[X] Course Title	[ ] Credit Value	[ ] Prerequisite
[X] Course Description	[ ] Editorial	[ ] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 2018/2019) calendar	**Proposed Text**
EDUC 461 ***Child Studies Seminar: Childhood Settings*** (3 credits) Prerequisite: Enrolment in Major in Child Studies; EDUC 302; EDUC 304 or 406; EDUC 460 concurrently. This course complements EDUC 460 and covers theoretical and applied aspects of working with children in early childhood settings. This course focuses on reflective practices, curriculum planning and using observational techniques. *NOTE: Students who have received credit for EDUC 374 may not take this course for credit.*	**EDUC 461** ***Child Studies Seminar: Early Childhood Settings*** (3 credits) Prerequisite: Enrolment in Major in Child Studies; EDUC 302; EDUC 304 or 406; EDUC 460 concurrently. This course complements EDUC 460 and covers theoretical and applied aspects of working with children in early childhood settings. This course focuses on reflective practices, curriculum planning and using observational techniques, and organization of childcare settings that promote the health, safety and education of children ages 0 to 5 years. *NOTE: Students who have received credit for EDUC 374 may not take this course for credit.*

Rationale:
Modification of the course title and description adds elements of health and safety and clarifies that the field placement settings are limited to early childhood settings (children ages 0 to 5 years), in order to meet the directives of the Ministère de la Famille et des Ainés. The term, "0 to 5 years", reflects the exact wording used by the Ministère de la Famille et des Ainés.

Resource Implications:
None

Other Programs within which course is listed:

None

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning
Office of the Provost and Vice-President, Academic Affairs
Chair, Academic Programs Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: January 30, 2019

SUBJECT: 2019-20 Undergraduate Calendar Curriculum Changes
Department of History
HIST-22
Revisions to Minor in Law and Society; new courses HIST 274, 329, 339, 351, 390; course title change to HIST 381, 388

The Arts and Science Faculty Council has reviewed and approved the following proposal and requests that it be considered at the next meeting of APC.

The **Department of History** proposes updating the Minor in Law and Society by adding HIST 339 *Crime and Punishment in Canadian History* which has been successfully offered as a slot course. In addition, replacing the six credit POLI 350 *(Canadian and Québec Law)* with the three credit POLI 321 *(Canadian and Québec Law)* in the Minor will correct an oversight from document US-2017-4-D21.

In addition, they propose converting four successful slot courses (HIST 274 *The Atlantic World*, HIST 329 *Music in History,* HIST 351 *England in the Reign of Henry VIII,* and HIST 390 *Urban History Laboratory*) into permanent courses. These courses which have had good enrolments, fit well into areas of expertise within the department.

Finally, they are updating the titles of HIST 381 *The Politics of the Past* and HIST 388 *Oral History and Creative Practice* to represent better the content and purpose of each course.

Thank you for your consideration of this proposal for which there are no additional resource implications. The new courses will come from the department's current allotment.

Reference documents:
FCC 2017.2/U_HIST-22
ASFC 2018-1M-D

Department of History

HIST-22

Memo from Chair

Program change

Minor in Law and Society

Public History with Internship Option

New course

HIST 274 *The Atlantic World*

HIST 329 *Music in History*

HIST 339 *Crime and Punishment in Canadian History*

HIST 351 *England in the Reign of Henry VIII*

HIST 390 *Urban History Laboratory*

Exclusion note removed

HIST 333 *History of Haiti: From Contact to Independence*

HIST 334 *History of Haiti: From Independence to Present*

Course title and description changed

HIST 381 *The Politics of the Past*

Course title changed

HIST 388 *Oral History and Creative Practice*

UNIVERSITÉ Concordia UNIVERSITY

FACULTY OF ARTS AND SCIENCE

Department of History

To: Paul Joyce, Associate Dean, Academic Programs, FAS

From: Peter Gossage, Chair, Department of History

Date: 30 November, 2017

Re.: History Department Undergraduate Curriculum Change Proposal

The following revisions to the Department of History's undergraduate curriculum were unanimously approved at a department meeting on Friday, November 17, 2017.

A modification to the "Approved Courses" section of the Minor in Law and Society is required to reflect the replacement of the six credit POLI 350 (Canadian and Quebec Law) with the three credit POLI 321 (Canadian and Quebec Law) which will take effect 2018-2019.

We also propose adding a small number of classes to the curriculum that reflect the developing teaching interests of faculty members. These courses have been on offer as slot courses, and have had successful enrolment and interest from both History students as well as the general Concordia student community. Of particular importance is the proposed HIST 339 Crime and Punishment in Canadian History, which meets the needs of the burgeoning Law and Society program. Previous to these changes, the calendar descriptions of HIST 333 (History of Haiti: From Contact to Independence) and HIST 334 (History of Haiti: From Independence to Present) had included an exclusion note for HIST 339 (The History of Haiti). Since the latter number has been assigned to a new course – and has not been used by another course in the past decade – the exclusion note has been removed.

The Special Topics in Oral History course, HIST 390 Urban History Laboratory, will be added to the list of 300-level courses curriculum for the Public History with Internship stream of our BA Honours in History program. At the request of their instructors, some course title revisions have been proposed to both economize title space and better reflect the current directions of these activities.

None of the proposed changes are major, nor do they involve any resource implications. All reassigned course numbers have been inactive for more than five years.

1455 de Maisonneuve W., Montreal, Quebec, Canada H3G 1M8
Tel. 514-848-2424 concordia.ca

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

PROGRAM CHANGE: Minor in Law and Society

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program: Minor in Law and Society
Degree:
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2018/2019) calendar	**Proposed Text**
24 Minor in Law and Society 3 ANTH/HIST/POLI/SOCI 285[3] 6 Chosen from ANTH 202[3]; HIST 205[3]; POLI 204[3]; SCPA 204[3]; SOCI 261[3]; students whose major program is in one of these units must draw from the other units 15 Chosen from ANTH 363[3], 380[3]; FPST 301[3], 321[3]; HIST 309[3], 315[3], 359[3], 360[3]; PHIL 343[3], 345[3]; POLI 311[3], 320[3], 324[3], 328[3], ~~350[6]~~, 388[3]; PSYC 242[3]; RELI 312[3]; SOCI 262[3], 263[3], 362[3], 363[3], 366[3], 367[3], 380[3]; of which no more than 3 credits may be at the 200 level; of which no more than 12 credits may be from one department. *NOTE: For details on the course descriptions in the program listed above, please refer to the individual departmental course listings.*	**24 Minor in Law and Society** 3 ANTH/HIST/POLI/SOCI 285[3] 6 Chosen from ANTH 202[3]; HIST 205[3]; POLI 204[3]; SCPA 204[3]; SOCI 261[3]; students whose major program is in one of these units must draw from the other units 15 Chosen from ANTH 363[3], 380[3]; FPST 301[3], 321[3]; HIST 309[3], 315[3], 339[3], 359[3], 360[3]; PHIL 343[3], 345[3]; POLI 311[3], 320[3], 321[3], 324[3], 328[3], 388[3]; PSYC 242[3]; RELI 312[3]; SOCI 262[3], 263[3], 362[3], 363[3], 366[3], 367[3], 380[3]; of which no more than 3 credits may be at the 200 level; of which no more than 12 credits may be from one department. *NOTE: For details on the course descriptions in the program listed above, please refer to the individual departmental course listings.*

Rationale:
POLI 350[6] (Canadian and Quebec Law) is being replaced with POLI 321[3] (Canadian and Quebec Law).

POLI 350 was replaced by POLI 321 under US-2017-4-D21 (POLI-38) in the 2018-19 Undergraduate calendar.

HIST 339[3] (Crime and Punishment in Canadian History) is being submitted for review in this dossier to become a permanent course and will be offered regularly to meet the needs of the Minor in Law and Society.

Resource Implications:
None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

PROGRAM CHANGE: Addition of Course to Honours Public History stream

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program: Honours History, Public History with Internship
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2018/2019) calendar	**Proposed Text**
C. Public History with Internship Option 6 Chosen from HIST 200-level courses with History Skills Workshops (courses denoted as HISW in the Undergraduate Class Schedule) 3 History of Europe (HIST 202[3], 206[3], 207[3], 208[3], 211[3], 235[3]) 3 History of Asia or Africa (from among HIST 242[3], 261[3], 262[3], 263[3], 264[3]) 3 History of the Americas (from among HIST 203[3], 205[3], 209[3], 210[3], 251[3], 253[3], 276[3], 277[3]) 3 HIST 200-level courses 6 HIST 300-level courses 3 HIST 300-level courses or elective credits from related disciplines 3 HIST 306[3] 6 Chosen from HIST 379[3], 380[3], 381[3], 387[3], 388[3], 389[3], 397[3] 3 HIST 402[3] (*The Philosophy and Practice of History*) 3 HIST 403[3] (*Methodology and History*) 9 HIST 400-level seminars 3 HIST 481[3] 3 HIST 485[3] 3 HIST 486[3]	**C. Public History with Internship Option** 6 Chosen from HIST 200-level courses with History Skills Workshops (courses denoted as HISW in the Undergraduate Class Schedule) 3 History of Europe (HIST 202[3], 206[3], 207[3], 208[3], 211[3], 235[3]) 3 History of Asia or Africa (from among HIST 242[3], 261[3], 262[3], 263[3], 264[3]) 3 History of the Americas (from among HIST 203[3], 205[3], 209[3], 210[3], 251[3], 253[3], 276[3], 277[3]) 3 HIST 200-level courses 6 HIST 300-level courses 3 HIST 300-level courses or elective credits from related disciplines 3 HIST 306[3] 6 Chosen from HIST 379[3], 380[3], 381[3], 387[3], 388[3], 389[3], 390[3], 397[3] 3 HIST 402[3] (*The Philosophy and Practice of History*) 3 HIST 403[3] (*Methodology and History*) 9 HIST 400-level seminars 3 HIST 481[3] 3 HIST 485[3] 3 HIST 486[3]

Rationale:
Due to the success of the HIST 387 Special Topics course, Urban History Laboratory, a request is being presented with this curriculum package to create a permanent number. This course would then be added to the selection of approved courses at the 300-level.

Resource Implications:
None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 274 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20XX/20XX) calendar	**Proposed Text**
	HIST 274 ***The Atlantic World*** (3 credits) This course examines how an 'Atlantic world' emerged between the 15th and 19th centuries. As societies in Africa, the Americas, and Europe came into increasingly regular contact, the ocean became a nexus rather than a gulf between them. By studying historical documents from the period and scholarly debates about how to interpret them, we explore why and how these long-distance connections provoked a range of unprecedented transformations for people on four continents. *NOTE: Students who have received credit for this topic under a HIST 298 number may not take this course for credit.*

Rationale:
The History Department, following the trends of the discipline, has increasingly moved toward a *transnational* perspective on the past: rather than understanding history in terms of the evolution of nation states, the emphasis has been on finding connections between societies. This course introduces students to the concept of Atlantic history, which is located *between* rather than *within* national boundaries and which ties together the histories of Europe, Africa and the Americas. The course will serve as an introduction to a wide range of upper-level History courses that will build upon its themes, such as HIST 308, HIST 332, HIST 353, HIST 354, HIST 376, HIST 394, and HIST 395. The enrolment numbers from the last two academic years are as follows: Fall 2016: 80/85, Fall 2017: 87/90.

Resource Implications:
None. This course will be offered in rotation from our existing course allotment.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 329 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number	[ ] Course Title	[ ] Credit Value	[ ] Prerequisite
[ ] Course Description	[ ] Editorial	[X] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 20XX/20XX) calendar	**Proposed Text**
	HIST 329 ***Music in History*** (3 credits) Prerequisite: See N.B. number (1). This course examines music as a medium for understanding the past. Depending on the historical focus, issues such as colonialism, nationalism, social movements, urban culture, youth culture, race, gender, and class through the prism of contemporaneous music genres may be considered. The course may also address the transformation of acoustic spaces and musical instruments, the rise of sound recording, radio broadcasting, online streaming, and the history of music copyright in relation to its composition, performance, recording, broadcasting, and streaming. Students have an option to create a podcast or curate a DJ set for a term project. *NOTE: Students who have received credit for this topic as HIST 398R Post-1945 United States History Through Music or under a HIST 398 number may not take this course for credit.*

Rationale:
This title differs from the slot course HIST 398 (Post-1945 United States History Through Music) to allow for flexibility in the time period and geography. This course was offered as a slot course in Winter 2014 with an enrolment that was 45/45, and in Fall 2017 with an enrolment of 41/44. This course expands our offerings in cultural history, which is a key strength of the department.

Resource Implications:
This course will be regularly alternated within the regular course allotment to provide variety in course selections for 300-level history courses.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 333 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree:
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [X] Other - Specify: Exclusion note removed

Present Text (from 2018/2019) calendar	**Proposed Text**
HIST 333 ***History of Haiti: From Contact to Independence*** (3 credits) Prerequisite: See N.B. number (1). This course is a study of Haitian history from early colonization through French control to independence in 1804. It covers pre-Columbian Taino society and the Spanish conquest; the period of piracy and French buccaneering in the 16th and 17th centuries; the emergence of a colonial slave society in the 18th century; the Haitian revolution and the rise of Toussaint Louverture; questions of class and colour; the emergence of the state; contingencies of citizenship and independence. The legacies of the colonial and revolutionary periods are fundamental to an understanding of post-independence and present-day Haiti. ~~*NOTE: Students who have received credit for HIST 339 may not take this course for credit.*~~	**HIST 333** ***History of Haiti: From Contact to Independence*** (3 credits) Prerequisite: See N.B. number (1). This course is a study of Haitian history from early colonization through French control to independence in 1804. It covers pre-Columbian Taino society and the Spanish conquest; the period of piracy and French buccaneering in the 16th and 17th centuries; the emergence of a colonial slave society in the 18th century; the Haitian revolution and the rise of Toussaint Louverture; questions of class and colour; the emergence of the state; contingencies of citizenship and independence. The legacies of the colonial and revolutionary periods are fundamental to an understanding of post-independence and present-day Haiti.

Rationale:
The exclusion note is outdated and is no longer relevant to the course.

Resource Implications:
None.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 334 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree:
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [X] Other - Specify: Exclusion note removed

Present Text (from 2018/2019) calendar	**Proposed Text**
HIST 334 ***History of Haiti: From Independence to Present*** (3 credits) Prerequisite: See N.B. number (1). This course is a study of Haitian history from independence to the present. It covers the early post-independence regimes; the demise of the plantation economy and the emergence of the Haitian peasantry; the indemnity to France; later 19th-century neo-colonialism and political instability; the U.S. Marine Occupation (1915 – 1934); culture, race and politics during and after the Occupation; the rise of the Duvalieriest state; and post-Duvalierist political instability. ~~*NOTE: Students who have received credit for HIST 339 may not take this course for credit.*~~	**HIST 334** ***History of Haiti: From Independence to Present*** (3 credits) Prerequisite: See N.B. number (1). This course is a study of Haitian history from independence to the present. It covers the early post-independence regimes; the demise of the plantation economy and the emergence of the Haitian peasantry; the indemnity to France; later 19th-century neo-colonialism and political instability; the U.S. Marine Occupation (1915 – 1934); culture, race and politics during and after the Occupation; the rise of the Duvalieriest state; and post-Duvalierist political instability.

Rationale:
The exclusion note is outdated and is no longer relevant to the course.

Resource Implications:
None.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 339 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program: Minor in Law and Society
Degree:
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20XX/20XX) calendar	**Proposed Text**
	HIST 339 ***Crime and Punishment in Canadian History*** (3 credits) Prerequisite: See N.B. number (1). This course examines the history of crime and punishment in Canada. Topics include the definition and regulation of deviance; policing; trials and the criminal law; prisons and theories of punishment; the death penalty; crime and the media. Students engage with a variety of primary and secondary sources in readings and assignments. *NOTE: Students who have received credit for this topic under a HIST 398 number may not take this course for credit.*

Rationale:
This course fits well in the burgeoning Minor in Law and Society and has been offered successfully as a slot course with enrolments of 45/45 in Fall 2016, 43/45 in Winter 2016 and 45/45 in Fall 2017.

Resource Implications:
None. This course will be offered regularly as part of the existing course allotment to meet the needs of the Law and Society program.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 351 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20XX/20XX) calendar	**Proposed Text**
	HIST 351 ***England in the Reign of Henry VIII*** (3 credits) Prerequisite: See N.B. number (1). This course examines English history in the first half of the 16th century. In addition to specifically examining the personality and politics of Henry VIII himself, lectures and assignments examine broader social, religious, economic, and legal developments in the kingdom during his reign. *NOTE: Students who have received credit for this topic under a HIST 398 number or as HIST 398L Tudor England may not take this course for credit.*

Rationale:
This course has been offered three times as a 398 Special Topics course (2014-15, 2015-16, 2016-17) with post-DNE enrolment remaining close to capacity each time. Winter 2015: 43/45; Winter 2016: 44/45; Fall 2016: 44/45. This course expands the range of courses that touch on the history of Late Medieval and Early Modern England, using the reign of a single king as a means of exploring the political, social and cultural world of the country. Not only does the course introduce students to the field of Tudor England, it also offers them an opportunity to use the abundant resources on the subject in the Concordia Library - which include a wide range of monographs, primary sources, documents and online databases.

Resource Implications:
None. This course will be offered under the department's regular allotment.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 381 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [X] Course Title [ ] Credit Value [ ] Prerequisite
[X] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 2018/2019) calendar	**Proposed Text**
HIST 381 ~~***History and Public Policy***~~ (3 credits) Prerequisite: See N.B. number (1). This course examines the uses of history and the role of the historian in the political~~, legal, and social~~ arena~~s~~, focusing on cases in which the past has underwritten social movements or mediated public controversies. Topics may include ~~professional work with government and non-governmental organizations, expert analyses and testimony before tribunals and truth commissions in human rights cases, Native land claims,~~ reparations, restorative justice, and the repatriation of cultural artifacts	**HIST 381** ***The Politics of the Past*** (3 credits) Prerequisite: See N.B. number (1). This course examines the uses of history and the role of the historian in the political arena, focusing on cases in which the past has underwritten social movements or mediated public controversies. Topics may include controversies over political recognition, historical apologies, reparations, restorative justice, and the repatriation of cultural artifacts.

Rationale:
The new title reflects the content of and purpose of the course more accurately, and the new description more accurately describes the way in which the course has been taught over the past decade.

Resource Implications:
None.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 388 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [X] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 2018/2019) calendar	**Proposed Text**
HIST 388 ~~*Telling Stories:*~~ ***Oral History***~~*, Memoryscapes and Digital Storytelling*~~ (3 credits) Prerequisite: See N.B. number (1). This course is an introduction to oral history theory, ethics, and practice, and surveys the many oral history projects underway in Montreal and around the globe.	**HIST 388** ***Oral History*** ***and Creative Practice*** (3 credits) Prerequisite: See N.B. number (1). This course is an introduction to oral history theory, ethics, and practice, and surveys the many oral history projects underway in Montreal and around the globe.
Rationale: New title is succinct and offers a broader scope for creative practices in oral history.	
Resource Implications: None.	
Other Programs within which course is listed: None.	

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **HIST-22** VERSION: 2

COURSE CHANGE: HIST 390 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: September 2018

Faculty/School: Arts and Science
Department: History
Program:
Degree: BA
Calendar Section/Graduate Page Number: 31.160

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20XX/20XX) calendar	**Proposed Text**
	HIST 390 ***Urban History Laboratory*** (3 credits) Prerequisite: See N.B. number (1). Students conduct original archival and/or oral history research on a selected aspect of Montreal's history and then go public with their research in creative and engaging ways. *NOTE: Students who have received credit for this course topic under a HIST 387 number may not take this course for credit.*

Rationale:
This course will be added to the selection of approved courses for the Honours in Public History stream. It has been taught twice as a special topics course in the past year to excellent effect. In one case, working with the Concordia Library, Special Collections, students delved into the Negro Community Centre Archives. In the second, working in partnership with the Atwater Library, students explored the history of Canada's first subscription library (founded 1828). Both times, more than 200 community members came out to a public showcase of student projects which also generated significant media attention, allowing students the opportunity to go public with their research in a very real way. This new course will continue and build on these efforts, but now anchored explicitly within our Public History program, which continues to be one of the department's great strengths.

This course was offered in Fall 2017 with an enrolment of 20/45, and was incorporated in the course HIST 388 Telling Stories: Oral History, Memoryscapes and Digital Storytelling during Winter 2017 with an enrolment of 33/45.

Resource Implications:
None. This course will be offered under the department's regular allotment. The use of the word Laboratory in the title reflects the exploratory nature of the course and does not require any additional physical space.

Other Programs within which course is listed:

None.

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning
Office of the Provost and Vice-President, Academic Affairs
Chair, Academic Programs Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: November 17, 2017

SUBJECT: Undergraduate Calendar Curriculum Changes
Department of Physics
PHYS-5
New courses PHYS 230, 330

The Arts and Science Faculty Council has reviewed and approved the following proposal and requests that it be considered at the next meeting of APC.

The Department of Physics is updating and improving its laboratory course offerings. Rather than offer many one and two credit laboratory courses which cover disparate topics and do not build on one another, they will consolidate this material into two well-defined and sequential 3-credit laboratory courses, PHYS 230 *Experimental Physics I* and PHYS 330 *Experimental Physics II.* These "new proposed 3-credit courses will allow students to develop a much higher level of data analysis and scientific communication competencies than was ever possible in the series of one and two credit courses" and "the skill set developed in these courses will better prepare…students for their continuing studies or professional careers".

These changes will strengthen the part of the Physics programs dealing with performing experiments, and will solve many of the organizational issues (both for students and the department) associated with one and two credit courses. The addition of these two dedicated 3-credit laboratory courses will allow this laboratory component to be included effectively in all of the Specialization and Honours programs in the department. These laboratory courses also are good preparation and logical prerequisites to both the Honours and Specialization research courses (PHYS 496 *Honours Research Project* and PHYS 497 *Specialization Research Project*) and have been added as such.

Thank you for your consideration of this proposal for which there are no additional resource implications. These changes result from a careful reorganization and restructuring of existing laboratory courses (PHYS 290, 291, 293, 297, 394).

Reference documents:
FCC 2017.1/PHYS-5
ASFC 2017-6M-B_PHYS-5

Department of Physics

PHYS-5

Memo from Chair

Program Changes

Core Program

BSc Honours in Physics

BSc Specialization in Physics (Option A)

BSc Specialization in Physics (Option B)

New Course

PHYS 230 *Experimental Physics I*

PHYS 330 *Experimental Physics II*

Prerequisite Change

PHYS 496 *Honours Research Project* (6 credits)

PHYS 497 *Specialization Research Project*

Concordia University
Arts and Science
Department of Physics

October 30th, 2017

Dr. Paul Joyce
Associate Dean, Academic Programs
Faculty of Arts and Science

Subject: New laboratory courses PHYS 230 and 330 for the BSc Physics programs.

Appendices:
1) Syllabus for PHYS 230.
2) Syllabus for PHYS 330.
3) Data summary of the study of five Canadian universities' experimental physics programs.

Dear Dr. Joyce,

We propose two new 3-credit BSc laboratory courses (PHYS 230 *Experimental Physics I*, and PHYS 330 *Experimental Physics II)* which would greatly improve the depth and coherence of our experimental physics teaching in all of our BSc programs (Major, Specializations, Honours). These courses would replace an equal number (six credits) of existing laboratory courses made up of 1-credit and 2-credit courses (students already in the programs would not be affected). *There are no new resource needs.* Our laboratory courses are taught by staff with support from the Undergraduate Teaching Lab Director, as was previously done for the other courses. This proposal would address long-standing needs to improve our laboratories and answer student demands, by creating full-fledged 3-credit courses. The course content would focus on teaching a clear sequence of experimental methods and skills, rather than simply demonstrating various theoretical concepts as was often the case in the current 1-credit courses. We note that we conducted an exhaustive study of the best practices in five top experimental physics departments across Canada and aligned this proposal with these high performing programs, while taking into account our resources (class size, equipment) and the research foci in our unit.

Currently, our BSc program experimental courses have 1-credit, 2-credit or 3-credit values. The Major in Physics program requires three (3) mandatory one-credit courses (PHYS 291, PHYS 293, PHYS 297), while Specialization in Biophysics and Honours in Biophysics programs require the same three 1-credit courses, plus one 3-credit (Specialization: PHYS 497) or 6-credit (Honours: PHYS 496) research project course. The Specialization in Physics and the Honours in Physics programs both require the three 1-credit courses, as well as the research courses (Specialization: PHYS 497, Honours: PHYS 496), in addition to one more 1-credit (PHYS 394) and one 2-credit (PHYS 290) course. We propose two 3-credit courses which would replace the equivalent of the 6-credit current teaching lab courses (PHYS 291, 293, 297, 394, and 290) in all of our programs. *The existing courses will stay in the calendar for the time being to serve students already in program.* First, we propose the replacement of the one-credit courses **PHYS 291** ***Experimental Mechanics I***, **PHYS 293** ***Experimental Electricity and Magnetism I*** and **PHYS 297** ***Experimental Optics***, by one 3-credit course, **PHYS 230** ***Experimental Physics I***. Secondly, we propose the replacement of courses **PHYS 290** ***Experimental Electronics*** (2 credits) and **PHYS 394** ***Experimental Atomic Physics*** (1 credit), by one 3-credit course, **PHYS 330** ***Experimental Physics II.*** These course replacements are intended to strengthen the experimental part of our Physics programs, and

to solve many organizational issues associated with the present experimental physics curriculum. In light of these course modifications, we propose that both courses PHYS 230 and PHYS 330 will become prerequisites to courses PHYS 496, *Honours Research Project* (6 credits) and PHYS 497, *Specialization Research Project* (3 credits).

PHYS 230 will be a required course in all of the undergraduate programs of the Department of Physics (Major, Specializations and Honours) as are the courses it replaces (PHYS 291, 293, 297). It will be open to in-program Physics students having completed or currently registered in nine Physics course credits.

PHYS 330 will be a required course in the BSc Specialization/Honours in Physics program (for both the Physics and Biophysics concentrations). The courses that it will replace were previously offered as elective courses for the Specialization in Physics (Option A) (PHYS 290, 394). The total number of available lab credits will therefore remain the same for Specialization (nine credits) and Honours (12 credits) in Physics students, and increase by three credits for Specialization and Honours in Biophysics students to nine and 12 credits, respectively. This course will be open to in-program Physics students who have completed PHYS 230; **or** PHYS 291, 293, 297.

PHYS 496 currently has the following prerequisite: Enrolment in Honours in Physics; permission of the Department. We propose changing the prerequisite to the following: PHYS 330; **or** PHYS 290, 291, 293, 297, 394; enrolment in Honours in Physics; a minimum of 45 Physics course credits completed; or permission of the Department.

PHYS 497 currently has the following prerequisite: Enrolment in the Specialization in Physics; permission of the Department. We propose changing the prerequisite to the following: PHYS 330; or PHYS 290, 291, 293, 297, 394; Enrolment in the Specialization in Physics; 45 credits completed in Physics; or permission of the Department.

Why make changes to our lab courses? In their present form, each lab course is attached to a specific theoretical course. In order to have labs related to a certain number of subjects, their credit values have been kept low (one or two credits). This has in turn created many issues that we intend to solve with this curriculum modification. In an experimental physics course, students need to learn data acquisition and analysis techniques based on error analysis and how to write complete laboratory reports to discuss their results. This is an unreasonable amount of work for only one course credit. Furthermore, the present arrangement does not allow students to build on the skills they have acquired in previous laboratory courses. These courses have no required sequence and are often taken concurrently, forcing us to teach the same very limited introductory level data analysis in each of them. In our current courses, students must reserve timeslots in which they will perform the required experiments. This system also has its shortcomings: there is no time reserved for teaching the concepts needed to analyse experimental data, it is difficult for students to form a community, it is often difficult for students to find three consecutive hours in which to perform experiments, the students are almost exclusively in contact with teaching assistants that serve as their instructors and these instructors never see the whole class at once to communicate important information or to give feedback that would benefit all students. This “open lab” system does have the advantage of being flexible for students and of making them feel welcome in our

laboratories. We intend to keep this last characteristic by still giving students access to our laboratories outside of their scheduled class times.

How did we design the new courses? This curriculum modification proposal has been created after studying the experimental physics curricula of five Canadian universities with flourishing experimental physics programs, and **adapting the identified best practices to the context of our Department of Physics' teaching laboratories**. The universities chosen for this study were: McGill, Queen's, University of British Columbia, Université de Montréal and Université de Sherbrooke. A summary of the study's findings has been included as an appendix to this letter. When studying the experimental Physics curricula of these Canadian departments of physics, we found that none of their courses are associated with a specific theoretical class but instead are stand-alone courses where the emphasis is placed on learning experimental Physics skills, not simply demonstrating theoretical principles. Their courses are all worth at least three credits and are set in a logical sequence of three mandatory courses (for Specialization or Honours programs). The initial physics lab courses of all of these universities feature lectures to teach the fundamentals of data analysis. Having analyzed our own present lab curriculum and those of fellow departments of Physics, we are confident that both of our new proposed 3-credit courses will allow students to develop a much higher level of data analysis and scientific communication competencies than was ever possible in our series of one and two credit courses. We believe that the skill set developed in these courses will better prepare our students for their continuing studies or professional careers, and for taking part in scientific research during their *Honours Research Project* (PHYS 496) or their *Specialization Research Project* (PHYS 497). These courses encourage a multi-disciplinary approach to science, as the experiments are taken from various fields of physics, often studying principles beyond physics/biophysics and including topics in chemistry, biochemistry and medical physics.

In line with what is done at these institutions: (i) Our new lab courses will be taught in regular time slots of three hours per week. Having a regularly scheduled class will open the possibility of teamwork, encourage exchange between students, facilitate the teaching of data analysis through lectures and tutorials, and encourage students to complete the course in a timely manner. (ii) Both of the proposed courses will focus on teaching experimental methods and will not rely on in-depth knowledge of the theory associated with each experiment. They will cover a wide variety of data analysis methods, with experiments taken from different fields of Physics. (iii) The evaluation of the courses will be mostly based on lab reports. (iv) The total number of lab credits offered (including the senior courses not being modified) will be nine for both of our Specialization programs, and 12 for our Honours programs.

Why fewer elective courses? Beginning with our program redesign about five years ago, we intended to increase the number of mandatory experimental lab credits in our Specialization (from six to nine) and Honours (from nine to 12) programs, but did not do so because the benefits of additional lab work were mitigated by the known limitations of our existing lab courses. The courses could not be re-designed earlier because of resource issues, which have been resolved (as discussed below). Now we can have higher quality lab courses, where Experimental Physics II can clearly add another layer of experimental knowledge and experiential learning to what is covered in Experimental Physics I and we can increase the number of lab credits to what we originally intended.

While these changes slightly reduce elective options in some programs, this is outweighed by the increased depth and experiential learning options provided by the new courses. Typically, in the Physics Specialization, some of the other courses were seldom offered in any event. Thus effectively, there is no change in the number of elective options for our students in the Physics specialization. For the Biophysics specialization, PHYS 290 and 394 were not integral to that program because they did not properly overlap with experimental biophysics as opposed to traditional physics. The new course PHYS 330 will be a balanced course (50%-50%) between Physics and Biophysics and will bring substantial added value to our Biophysics program students. These additional benefits more than balance the loss of one elective course.

No additional faculty resources are needed for these modifications. The existing team, comprised of the Teaching Laboratories Director and the Teaching Laboratories Coordinator, will give about three 3-hour lectures as part of their course mandates: two in **PHYS 230** and one in **PHYS 330.** The laboratory sessions for both new courses will be taught by a team of Teaching Assistants, led by the Teaching Laboratories Coordinator. The number of required Teaching Assistants would be roughly the same as for the present experimental physics courses and leading the in-lab classes would be part of the mandate of Teaching Laboratories Coordinator. One additional teaching assistant would likely be necessary in the short term to ensure that the courses being replaced can still be offered during the first years following this curriculum modification.

The proposed calendar descriptions of PHYS 230 and PHYS 330 are presented below, along with a few comments relevant to each course.

PHYS 230 ***Experimental Physics I***
Developed by: Physics Teaching laboratories team.
Prerequisite: Enrolment in a Physics program; nine credits in Physics previously or concurrently.

Calendar entry: This course introduces the basic techniques, methods and tools used in experimental physics. Students acquire basic measurement, data analysis and report writing skills through a series of physics experiments, lectures and tutorials. They learn to use electronic instruments, to evaluate the uncertainty of measurements, and to analyze their data with different methods, using proper data analysis software to display and discuss their results correctly through the production of laboratory reports.

Following the present curriculum modifications, students who have successfully completed one of the courses (PHYS 291, PHYS 293 or PHYS 297) will be required to complete that series of courses and will not be allowed to register for PHYS 230 (except with permission of the Undergraduate Program Director) while students who have not completed any of PHYS 291, 293 or 297 will be required to register for PHYS 230 and will not be allowed to register for PHYS 291, 293 or 297. As such, PHYS 291, PHYS 293 and PHYS 297 will remain in the Calendar for a period of three years following this experimental Physics curriculum modification to ensure that current students can complete these courses.

Experimental Physics I acts as a broad introduction to the methods used in experimental physics, teaching students the many skills necessary for Physics lab work: using measurement instruments, using data acquisition and analysis software, performing a specified analysis (*e.g*. linear and non-linear regressions, comparison to a theoretical curve, signal analysis, analysis of a normal distribution, counting experiment methods), interpreting experimental results, keeping a good experimental log and writing lab reports. Since this is an introductory course, the students will be given detailed procedures on how to conduct their experiments and clear indications as to what discussion points are expected to be included in their lab reports. As this course is planned to have a 16 student per section maximum, we can accommodate multiple sections without additional resources. We plan to offer one PHYS 230 section during the Fall term, two in the Winter term and one during the Summer.

PHYS 330 ***Experimental Physics II***
Developed by: Physics Teaching laboratories team.
Prerequisite: PHYS 230; or PHYS 291, 293, 297.

Calendar entry: This course builds on the competencies developed in Experimental Physics I, introducing various physics experiments that require a higher level of experimental skills and deeper insight into how an experiment should be conducted. The data analysis required by these experiments is more involved than that of Experimental Physics I. Students develop their scientific communication skills through the production of reports and an oral presentation.

Experimental Physics II is designed to reinforce the competencies acquired from Experimental Physics I, introducing students to more complex physics apparatus, often involving multiple physical concepts and more challenging data analysis methods, including comparison to computational results and more numerical methods such as Fourier transforms. This course will also offer students freedom in determining the procedure to be used when performing the experiments; they will be invited to decide how to analyze their data, which will, in turn, orient their data acquisition procedure. As this pedagogical method is more time consuming and the experiments are more challenging than those of PHYS 230, students will have two weeks to perform each experiment. Because of the additional responsibilities in choosing how to acquire and analyze their data, students will be expected to write an in-depth procedure, explaining their data-acquisition process. Whereas in PHYS 230, students will be told what to discuss about their results, PHYS 330 students will be expected to decide how to discuss their results in their reports. Students will be offered a selection of experiments to choose from. Depending on their choices, they will have the opportunity to develop a set of important experimental skills, including scientific programing, circuit building, experiment automation, and creating (*e.g*. 3D printing) new components of an experimental setup. This course introduces many of the competencies that will be of use to students doing PHYS 496 (*Honours Research Project*) or PHYS 497 (*Specialization Research Project*); in these courses, students perform a capstone physics research project in one of the Research laboratories of the Department of Physics.

Students who have successfully completed PHYS 290 (2 credits) or PHYS 394 (1 credit) may complete their three credits of lab work in this block by completing the other course, but will not be allowed to register for PHYS 330. However, students who have not completed either course (PHYS 290 or

PHYS 394) will be required to register for PHYS 390 and will not be allowed to register for PHYS 290 or 394. As such, PHYS 290 and PHYS 394 will remain in the Calendar for a period of three years following this experimental Physics curriculum modification to ensure that current students can complete these courses. After this point PHYS 291, 293, 297, 290, and 394 will be removed as prerequisites from courses PHYS 496 and PHYS 497.

PHYS 330 is planned to have a 12-student capacity per section initially, which could be expanded by developing additional experiment choices. We expect to open two PHYS 330 sections during Fall terms, one for Winter terms, and one section during the Summer. No additional resources of any kind are needed to implement this proposal.

The proposed curriculum modifications have been approved unanimously by the Departmental Curriculum Committee on September 25th, 2017. The proposed curriculum modifications **have been approved unanimously by the Departmental Council on October 2nd, 2017.**

Thank you for your consideration, and please do not hesitate to contact us if additional information are needed.

Alexandre Champagne
Chair

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

PROGRAM CHANGE: Physics Core Program

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Honours, Specialization, Major in Physics
Degree: BSc
Calendar Section/Graduate Page Number: 32.230

Type of Change:

[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2018/2019) calendar	**Proposed Text**
42 Core Program 6 MAST 218^{3}, 219^{3} ~~33~~ PHYS 232^{3}, 236^{3}, 245^{3}, 252^{3}, 253^{3}, 334^{3}, 335^{3}, 354^{3}, 367^{3}, 377^{3}, 435^{3} ~~3 PHYS 291^{1}, 293^{1}, 297^{1}~~	**42 Core Program** 6 MAST 218^{3}, 219^{3} 36 PHYS 230^{3}, 232^{3}, 236^{3}, 245^{3}, 252^{3}, 253^{3}, 334^{3}, 335^{3}, 354^{3}, 367^{3}, 377^{3}, 435^{3}

Rationale:
This course replacement will improve the depth and coherence of our experimental physics teaching in all of our BSc programs. PHYS 230 replaces an equal amount (3 credits) of current core laboratory courses made up of 1-credit courses (students already in the programs would not be affected). This change addresses long-standing needs to improve our laboratories and answer student demands, by creating a full-fledge 3-credit course. Its content will focus on teaching a clear sequence of experimental methods and skills, rather than simply demonstrating various theoretical concepts as was often the case in the current 1-credit courses.

Resource Implications:
None. Resources and time that previously were invested in the PHYS 291^{1}, 293^{1}, 297^{1} labs will now be directed to PHYS 230^{3}.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

PROGRAM CHANGE: Honours in Physics

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Honours in Physics
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:
[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2018/2019) calendar	**Proposed Text**
69 BSc Honours in Physics 42 Core Program 6 PHYS 496[6] AND *Concentration in Physics* ~~15~~ PHYS 345[3], 355[3], 459[3], 468[3], 478[3] 3 Chosen from PHYS 436[3], 458[3] ~~3 Chosen from PHYS 290[2], 370[3], 394[1], 440[3], 443[3], 445[3], 498[3]~~ OR *Concentration in Biophysics* ~~9~~ BIOL 266[3]; PHYS 260[3], 460[3] ~~9~~ Chosen from CHEM 235[3], 271[3], 431[3]; PHYS 345[3], 370[3], 440[3], 445[3], 459[3], 461[3], 462[3], 463[3] 3 Chosen from BIOL 261[3], 340[3], 367[3], 371[3]; PHYS 443[3]	**69 BSc Honours in Physics** 42 Core Program 6 PHYS 496[6] AND *Concentration in Physics* 18 PHYS 330[3], 345[3], 355[3], 459[3], 468[3], 478[3] 3 Chosen from PHYS 370[3], 436[3], 440[3], 443[3], 445[3], 458[3], 498[3] OR *Concentration in Biophysics* 12 BIOL 266[3]; PHYS 260[3], 330[3], 460[3] 6 Chosen from CHEM 235[3], 271[3], 431[3]; PHYS 345[3], 370[3], 440[3], 445[3], 459[3], 461[3], 462[3], 463[3] 3 Chosen from BIOL 261[3], 340[3], 367[3], 371[3]; PHYS 443[3]

Rationale:
Adding the new required course, PHYS 330, will improve the depth and coherence of our experimental physics teaching in all of our BSc programs. This change addresses long-standing needs to improve our laboratories and answer student demands by creating a more in-depth 3-credit course. It will build on the competencies acquired from the new class PHYS 230, introducing new data analysis methods and further developing the students' experimental physics skill set. A list of experiments taken from the fields of both concentrations (Physics and Biophysics) will be available for students to choose from.

The total number of lab credits will remain the same for students in the Specialization, Option in Physics (nine credits) or Honours, Concentration in Physics (12 credits) and will increase by three credits for students in the Specialization (nine credits) or Honours (12 credits) in Biophysics.

Resource Implications:
None. Resources and time that previously were invested in the PHYS 290 and PHYS 394 labs will now be directed to PHYS 330.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

PROGRAM CHANGE: Specialization in Physics Option A

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Specialization in Physics Option A: Physics
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:

[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2018/2019) calendar	**Proposed Text**
66 BSc Specialization in Physics *Option A: Physics* 42 Core Program ~~18~~ PHYS 345[3], 355[3], 459[3], 468[3], 478[3], 497[3] 3 Chosen from PHYS 436[3], 458[3] ~~3 Chosen from PHYS 290[2], 370[3], 394[1], 440[3], 443[3], 445[3], 498[3]~~	**66 BSc Specialization in Physics** *Option A: Physics* 42 Core Program 21 PHYS 330[3], 345[3], 355[3], 459[3], 468[3], 478[3], 497[3] 3 Chosen from PHYS 370[3], 436[3], 440[3], 443[3], 445[3], 458[3], 498[3]

Rationale:
Adding the new required course, PHYS 330, will improve the depth and coherence of our experimental physics teaching in all of our BSc programs. This change addresses long-standing needs to improve our laboratories and answer student demands by creating a more in-depth 3-credit course. It will build on the competencies acquired from the new class PHYS 230, introducing new data analysis methods and further developing the students' experimental physics skill set. A list of experiments taken from the fields of both specialization options (Physics and Biophysics) will be available for students to choose from.
The total number of lab credits on offer will remain the same for Specialization, Physics option, students at nine credits (Specialization) and 12 credits (Honours, Concentration in Physics), where PHYS 330[3] replaces choices PHYS 290[2] and 394[1]. This course replacement will improve the depth and coherence of our experimental physics teaching in all of our BSc programs.

Resource Implications:
None. Resources and time that previously were invested in the PHYS 290 and PHYS 394 labs will now be directed to PHYS 330.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

PROGRAM CHANGE: Specialization in Physics Option B

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Specialization in Physics Option B: Biophysics
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:

[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2018/2019) calendar	**Proposed Text**
66 BSc Specialization in Physics *Option B: Biophysics* 42 Core Program ~~12~~ BIOL 266^3; PHYS 260^3, 460^3, 497^3 ~~9~~ Chosen from CHEM 235^3, 271^3, 431^3; PHYS 345^3, 370^3, 440^3, 445^3, 459^3, 461^3, 462^3, 463^3, 468^3 3 Chosen from BIOL 261^3, 340^3, 367^3, 371^3; PHYS 443^3	**66 BSc Specialization in Physics** *Option B: Biophysics* 42 Core Program 15 BIOL 266^3; PHYS 260^3, 330^3, 460^3, 497^3 6 Chosen from CHEM 235^3, 271^3, 431^3; PHYS 345^3, 370^3, 440^3, 445^3, 459^3, 461^3, 462^3, 463^3, 468^3 3 Chosen from BIOL 261^3, 340^3, 367^3, 371^3; PHYS 443^3

Rationale:
Adding the new required course, PHYS 330, improves the depth and coherence of our experimental physics teaching in all of our BSc programs. This change addresses long standing needs to improve our laboratories and answers student demand by creating a more in-depth 3-credit course. It builds on the competencies acquired from the new class PHYS 230, introducing new data analysis methods and further developing the students' experimental physics skill set. A list of experiments taken from the fields of both specialization options (Physics and Biophysics) will be available for students to choose from.

The total number of lab credits will increase by three credits for students in the Specialization (nine credits) or Honours (12 credits) in Biophysics.

Resource Implications:
None. Resources and time that previously were invested in the PHYS 290 and PHYS 394 labs will now be directed to PHYS 330.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

COURSE CHANGE: PHYS 230 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Physics core
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	PHYS 230 ***Experimental Physics I*** (3 credits) Prerequisite: Enrolment in a Physics program; nine credits in Physics previously or concurrently. This course introduces the basic techniques, methods and tools used in experimental physics. Students acquire basic measurement, data analysis and report writing skills through a series of physics experiments, lectures and tutorials. They learn to use electronic instruments, to evaluate the uncertainty of measurements, and to analyze their data with different methods, using proper data analysis software to display and discuss their results correctly through the production of laboratory reports. *NOTE: Students who have received credit for PHYS 291, 293, or 297 may not take this* course *for credit.*

Rationale:
This course replaces PHYS 291, 293 and 297 (all 1-credit courses) in our core program. This replacement improves the depth and coherence of our experimental physics teaching in all of our BSc programs. PHYS 230 replaces an equal number of current core laboratory course credits (3) made up of 1-credit courses (students already in the programs would not be affected). This change addresses long-standing needs to improve our laboratories and answers student demand by creating a full-fledged 3-credit course. Its content focuses on teaching a clear sequence of experimental methods and skills, rather than simply demonstrating various theoretical concepts as was often the case in the current 1-credit courses. The entries for PHYS 291, 293 and 297 will be deleted from the Undergraduate Calendar at a later time, when students having started this course series before the proposed curriculum modification will have taken all three of these classes.

Resource Implications:
None. Resources and time that previously were invested in the PHYS 291^1, 293^1, 297^1 labs will now be directed to PHYS 230^3.

Other Programs within which course is listed:

None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

COURSE CHANGE: PHYS 330 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Physics core
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:

[ ] Course Number	[ ] Course Title	[ ] Credit Value	[ ] Prerequisite
[ ] Course Description	[ ] Editorial	[X] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	PHYS 330 ***Experimental Physics II*** (3 credits) Prerequisite: PHYS 230; or PHYS 291, 293, 297. This course builds on the competencies developed in Experimental Physics I, introducing various physics experiments that require a higher level of experimental skills and deeper insight into how an experiment should be conducted. The data analysis required by these experiments is more involved than that of Experimental Physics I. Students develop their scientific communication skills through the production of reports and an oral presentation. *NOTE: Students who have* received *credit for PHYS 290 or 394 may not take this course for credit.*

Rationale:
This new course, PHYS 330 will be required for Physics Specialization and Honours students and will improve the depth and coherence of our experimental physics teaching in all of our BSc programs. This change addresses a long-standing need to improve our laboratories and answers student demand by creating a more in-depth 3-credit course. It will build on the competencies acquired from the new class PHYS 230, introducing new data analysis methods and further developing the students' experimental physics skill set. A list of experiments taken from the fields of both concentration fields (Physics and Biophysics) will be available for students to choose from.

The total number of lab credits will remain the same for students in the Specialization, Option in Physics (nine credits) or Honours, Concentration in Physics (12 credits) and will increase by three credits for students in the Specialization (nine credits) or Honours (12 credits) in Biophysics.

Resource Implications:
None. Resources and time that previously were invested in the PHYS 290 and PHYS 394 labs will now be directed to PHYS 330.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

COURSE CHANGE: PHYS 496 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Honours in Physics
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [X] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 2018/2019) calendar	**Proposed Text**
PHYS 496 ***Honours Research Project*** (6 credits) Prerequisite: ~~E~~nrolment in Honours in Physics; permission of the Department. A research project for honours students that is carried out on a special topic in physics, biophysics, or applied physics under the supervision of a faculty member.	**PHYS 496** ***Honours Research Project*** (6 credits) Prerequisite: PHYS 330; or PHYS 290, 291, 293, 297, 394; and enrolment in Honours in Physics; and 45 credits completed in Physics; or permission of the Department. A research project for honours students that is carried out on a special topic in physics, biophysics, or applied physics under the supervision of a faculty member.

Rationale:
The knowledge acquired in PHYS 330 is required to engage in a research project at the level of PHYS 496. Specific skills acquired in laboratory courses are a necessary prerequisite for honours research projects. PHYS 330 replaces PHYS 290 and 394, and the prerequisite for PHYS 330 is PHYS 230 (replacing all of PHYS 291, 293 and 297). The prerequisite of 45 credits completed in Physics ensures that students who take this course are in the final year of their program and have the appropriate background.
Permission is not needed in general, however in special cases during the transition period, a permission could be given to wave certain prerequisites.

Resource Implications:
None.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **PHYS-5** VERSION: 5

COURSE CHANGE: PHYS 497 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2019

Faculty/School: Arts and Science
Department: Physics
Program: Specialization in Physics
Degree: BSc
Calendar Section/Graduate Page Number: 31.230

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [X] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 2018/2019) calendar	**Proposed Text**
PHYS 497 ***Specialization Research Project*** (3 credits) Prerequisite: ~~E~~nrolment in the Specialization in Physics; permission of the Department. This is an independent studies course for advanced specialization students in which a special topic in physics, biophysics, or applied physics is studied under the supervision of a faculty member. The student is required to write a report and give a brief presentation.	**PHYS 497** ***Specialization Research Project*** (3 credits) Prerequisite: PHYS 330; or PHYS 290, 291, 293, 297, 394; and enrolment in the Specialization in Physics; and 45 credits completed in Physics; or permission of the Department. This is an independent studies course for advanced specialization students in which a special topic in physics, biophysics, or applied physics is studied under the supervision of a faculty member. The student is required to write a report and give a brief presentation.

Rationale:
The knowledge acquired in PHYS 330 is required to engage in a research project at the level of PHYS 497. Specific skills acquired in laboratory courses are a necessary prerequisite for specialization research projects. PHYS 330 will replace PHYS 290 and 394, and the prerequisite for PHYS 330 is PHYS 230 (replacing all of PHYS 291, 293 and 297). The prerequisite of 45 credits completed in Physics ensures that students who take this course are in the final year of their program and have the appropriate background.

Permission is not needed in general, however in special cases during the transition period, a permission could be given to wave certain prerequisites.

Resource Implications:
None.

Other Programs within which course is listed:

None

PHYS 230 Experimental Physics 1

Department of Physics, Concordia University

PHYS 230 Prerequisite: Open to in-program Physics students having completed or currently registered in 9 Physics course credits.

(PHYS 230 Calendar entry) Experimental Physics 1. This course aims to introduce the basic techniques used in experimental physics. Students will acquire basic measurement, data analysis and report writing skills through a series of physics experiments, lectures and tutorials. They will learn to use electronic instruments, to evaluate the uncertainty of measurements, to analyze their data with different methods, using proper data analysis software and to display and discuss their results correctly through the production of laboratory reports.

Objectives

The purpose of this course is to give students the basic competencies needed to perform physics experiments. In a few introductory lectures, the foundations of data analysis will be presented: statistical distributions, error analysis, linear and non-linear curve fitting, uncertainty and its propagation. These concepts will be used directly for a few tutorial styled experiments during which basic lab skills will also be developed. Students will learn to use multi-meters, oscilloscopes, function generators, simple circuits, a basic data acquisition system and the software that will be used to analyze their data, OriginPro. In the process, they will acquire techniques to increase their measurements' precision and evaluate their uncertainty. In subsequent weeks, the students will perform a number of experiments taken from different fields of physics. These experiments are chosen to introduce a wide variety of measurement and data analysis methods, among which, linear and non-linear regressions, comparison to a theoretical curve, signal analysis, analysis of a normal distribution and counting experiment methods. Each experiment will be performed in teams of two and lead to the production of one scientific report per student. Guidelines for formatting tables and graphs and for writing reports will be presented and available in the provided laboratory manual. No specific theoretical physics knowledge is prerequisite for this course even though most experiments will be based on demonstrating a physics theory. Every experiment will be self-contained and give a sufficient, functional knowledge of the theory it refers to. Emphasis will be put on the experimental methods to prove a model rather than on developing the theory itself.

Learning outcomes

- The ability to assemble a basic circuit.
- The ability to use experimental apparatus to acquire scientific data.
- The ability to use contemporary data analysis tools.
- The ability to analyze quantitative results using prescribed data analysis methods
- The ability to interpret and discuss scientific results.
- The ability to communicate scientific results in written reports.
- The ability to work in teams.

Required Text

Experimental Physics 1 Laboratory Manual: PHYS 230 Course pack, available at the Loyola Campus Bookstore.

Tentative syllabus and schedule

Week	Topic
1	Lecture: Writing a scientific laboratory report, reporting data in properly formatted tables and graphs; data analysis introduction on measurements, their uncertainties and the propagation of uncertainties through calculations.
2	Experiment 1: Simple circuit experiment performed by all students as an introduction to using measurement instruments; tutorial on using the provided software to create tables and graphs and perform simple data analysis.
3	Lecture: The normal distribution, least-square fitting, chi-squared test.
4	Experiment 2: RLC circuit experiment performed by all students as an application to what was learned in the data analysis lectures; tutorial on extended data analysis software functionalities.
5	Each team of 2 students performs one of the experiments #3 to #10
6	Each team of 2 students performs one of the experiments #3 to #10
7	Each team of 2 students performs one of the experiments #3 to #10
8	Each team of 2 students performs one of the experiments #3 to #10
9	Each team of 2 students performs one of the experiments #3 to #10
10	Each team of 2 students performs one of the experiments #3 to #10
11	Each team of 2 students performs one of the experiments #3 to #10
12	Each team of 2 students performs one of the experiments #3 to #10
13	Students hand in their last lab report.

Experiments

1. Simple DC Circuits
2. RLC Circuits with Alternating Current
3. Kater's Pendulum
4. The Electron's Charge to Mass Ratio
5. Surface Tension
6. Magnetic Field of Coils
7. Waves in Transmission Lines
8. The Beer-Lambert Law
9. Light Intensity Mapping
10. The Photo-electric Effect

Evaluation of the course

- 10% Prelab tests before experiments #3 to #10
- 10% Two assignments following the lectures of weeks 1 and 3
- 80% Laboratory reports for all experiments

All experiments are done in teams of 2 students, but the data must be analyzed and the laboratory reports must be written separately.
Following both the lectures of weeks 1 and 3, you will be given an assignment to be handed in at the beginning of your next class (in the laboratory), this is to make sure that you have understood the concepts that were presented before using them in the laboratory setting. Following experiments #1 and #2, you will have to complete the required analysis and hand in your results in proper table and graph formats at the beginning of the following class.

At the beginning of the semester, you will be given the order in which your team will perform experiments #3 to #10. At the beginning of each of these experiments, you will have to complete a prelab test to ensure that you have carefully read and understood the theory and procedure concerning your experiment. If this prelab test is passed (60% or more), you will be awarded full marks for it. If it is failed, you will be invited to take a moment to read and understand the experiment's procedure, after which time you will be allowed to complete the pretest once more. If it is failed again, you will be given 0% for this prelab test. You should be well aware that coming unprepared to a lab session will also reduce the amount of time you have to complete your experiment.

You are welcome to come back to the Physics laboratories during their opening hours, after the lab session of a given experiment. As long as the required setup is not being used, you will be allowed to take additional data.

It is expected that you will need to work an average of 4 hours per week outside of class, to produce the required reports and complete the assignments.

You will hand in the reports for these experiments (#3 to #10) before the following class. All your reports will be handed in as a pdf file on the *Moodle* account of this course. The files you submit will be checked for plagiarism by an online service. For a late lab report, 5% will be deducted from its grade for each day of lateness.

PHYS 330 Experimental Physics 2

Department of Physics, Concordia University

PHYS 330 Prerequisite: PHYS 230 (Experimental Physics 1)

(PHYS 330 Calendar entry) Experimental Physics 2. This course builds on the competencies developed in Experimental Physics 1, introducing various physics experiments that require a higher level of experimental skills and deeper insight on how an experiment should be conducted. The data analysis required by these experiments will also be more involved than that of *Experimental Physics 1*. The scientific communication skills of students will further be developed through the production of reports, posters and/or oral presentations.

Objectives

The purpose of this course is to consolidate and expand the experimental physics competencies developed in the PHYS 230 course. With this in mind, the student is presented with a set of experiments that are more complex in nature, requiring more sophisticated data measurement methods. During these experiments, the students will be expected to do calibrations, adjustments of their setup and to make certain choices about the best procedure for acquiring their data. Students will be required to make certain decisions on how to analyze their data; this will, in turn, help them develop the measurement procedure that should be used. Students will have the opportunity to choose between experiments that will develop more deeply certain desired skills like programming the automated data acquisition of an experiment, machining certain components of a setup or building certain circuit components needed for an experiment. Students will continue developing scientific communication skills by writing reports, as they learned in PHYS 230 but they will be expected to write an in-depth procedure, explaining and justifying the data-acquisition process that they will have developed. In this course, students will not be told what specific points to discuss in analyzing their results (contrary to what was done in PHYS 230); they will therefore need to develop an understanding of how to make a detailed argument, highlighting the tests performed to validate their hypotheses and explaining the shortcomings of their methods. Students will also develop their scientific communication skills through the production of an oral presentation. This course will build on the data analysis skills developed in PHYS 230, assuming students have a good knowledge of statistical error analysis and are adept at using the OriginPro data analysis software. They will also come to learn basic programing skills by creating data-acquisition codes used to control sensors and by performing numerical calculations to find the expected results of some of their experiments. No specific theoretical physics knowledge is prerequisite for this course even though most experiments will be based on demonstrating a physics theory. Every experiment will be self-contained and give a sufficient, functional knowledge of the theory it refers to. Emphasis will be put on the experimental methods to prove a model rather than on developing the theory itself.

Learning outcomes

- The ability to use experimental apparatus to acquire scientific data.
- The ability to plan and produce the calibration of a scientific instrument.
- The ability to develop an experimental procedure, leading to precise and accurate results.
- The ability to devise and control an automated data-acquisition.

- The ability to use contemporary data analysis tools.
- The ability to analyze and interpret quantitative results using different data analysis methods.
- The ability to devise an analytical process to reach an experiment's goals.
- The ability to develop an argument, demonstrating the validity (or absence of such) of a series of hypotheses.
- The ability to communicate scientific results in written reports and oral presentations.
- The ability to work in teams.

Required Text

Experimental Physics 2 Laboratory Manual: PHYS 330 Course pack, available at the Loyola Campus Bookstore.

Tentative syllabus and schedule

Week	Topic
1	Lecture: Introduction of the course, presentation of lab report requirements, discussion on the planning of an experiment and its analysis in various contexts. Introduction to the basic programing skills required.
2-3	Each team of 2 students performs one of their selected experiments
4-5	Each team of 2 students performs one of their selected experiments
6-7	Each team of 2 students performs one of their selected experiments
8-9	Each team of 2 students performs one of their selected experiments
10-11	Each team of 2 students performs one of their selected experiments
12-13	Each team of 2 students performs one of their selected experiments
Final Exam Period	Students perform their oral presentations in class.

Experiment choices

1. The Physical Pendulum
2. Speed of Light Measurement
3. Fresnel's Laws
4. Microwave Optics
5. X-ray Diffraction
6. Fourier Analysis of Waveforms
7. Millikan's Oil Drop Experiment
8. ESR Spectroscopy
9. Magnetic Resonance Imaging
10. NIR Spectroscopy

Evaluation of the course

- 10% Prelab tests before experiments
- 10% Laboratory notebooks
- 70% Laboratory reports for all experiments
- 10% Oral presentation

All experiments are done in teams of 2 students, but the data must be analyzed and the laboratory reports must be written separately.

At the beginning of the semester, you will be asked to form your teams and select which labs you will perform from the experiment list in your lab manual. Each team will be given the order in which they are to perform these labs. At the beginning of each of these experiments, you will have to complete a prelab test to ensure that you have carefully read and understood the theory and procedure concerning your experiment. If this prelab test is passed (60% or more), you will be awarded full marks for it. If it is failed, you will be invited to take a moment to read and understand the experiment's procedure, after which time you will be allowed to complete the pretest once more. If it is failed again, you will be given 0% for this prelab test. You should be well aware that coming unprepared to a lab session will also reduce the amount of time you have to complete your experiment.

You have two classes to complete the lab work for a given experiment and you will hand in the report at the beginning of the class following these two lab sessions. For a late lab report, 5% will be deducted from its grade for each day of lateness. All your reports will be handed in as a pdf file on the *Moodle* account of this course. The files you submit will be checked for plagiarism by an online service.

During your experiments you will fill out one laboratory notebook per team, writing down your experimental procedure, your observations and your data. The specific requirements for keeping a proper notebook are described in your laboratory manual. These notebooks will be graded after each experiment is concluded.

There will be a class during the final exam period during which each team will do an oral presentation on one of their performed experiments. You will be informed at the beginning of the semester which experiment your team will be presenting.

You are welcome to come back to the Physics laboratories during their opening hours, after the initial lab session of a given experiment. As long as the required setup is not being used, you will be allowed access to it.

It is expected that you will need to work an average of 4 hours per week outside of class, to produce the required reports and prepare your oral presentation.

Study of the experimental physics programs of 5 Canadian universities

To help in developing a new experimental physics curriculum for Concordia's Department of Physics, the experimental curriculum of the following Physics Departments were studied:

- Mcgill
- Queen's
- UBC
- Université de Montréal
- Université de Sherbrooke

Here are the main results of this study, comparing these 5 departments on various curriculum characteristics. Note that only courses of the level of Quebec's undergraduate program were considered (Cegep level classes are not included in these results).

Number of laboratory courses

BSc Phys (Honours or Specialization)

- **All 5 universities have 3 mandatory Lab courses**
- **3 credit courses** except queen's 3rd: 6 credits
- McGill & U de S: 1 extra optional advanced lab

Joint programs / Majors

- McGill: Labs 1 & 2 the same as honors, Lab 3: version for major students
- Queen's: Labs 1 & 2
- UBC: Labs 1 & 2 (Chemistry, Computer Sc., Math joint programs)
  Lab 1 & optional lab 3 (Astronomy program)
- U de M: Only lab 1 (Math, Computer Sc. joint programs)

Note: UBC's 1st and Queen's 1st & 2nd labs **last 2 semesters** (fall, winter)

Lab Schedule

Lab Time

Most cases: 3 hour lab time every week
U de S 2nd, 3rd and 4th lab; Queen's 3rd lab: 6 hours (2 x 3 hour blocks)

Weekly Schedule

Most cases: Predetermined 3 hour block (or 2 blocks) with all the students of a section
McGill 3rd & 4th lab, UBC 3rd lab: Open lab

Number of Experiments

	Lab 1	Lab 2	Lab 3	Lab 4
McGill	9	5 + 1 project	3 of 20 (choice)	3 of 20 (choice)
Queen's	F: 8 W: 7	F: 4 W: 1 project	5 of 20 (choice)	
UBC	F: 7 W: 4 of 8	4	2 of 14 (choice)	
U de M	7	6	5 of 9 (choice)	
U de S	7	7	8	3 of 8 (choice)

Note: UBC's 1st and Queen's 1st & 2nd labs **last 2 semesters** (fall, winter)

Lectures

McGill

- Lab 1: 1h20min/week on data analysis. 25% of grade
- Lab 2: 1h20min/week on Matlab, programing, LaTex and writing a research paper. 20% of grade

Queen's

- Lab 1: 2h/week for half the semester on data analysis. 25% of grade

UBC

- Lab 1 (Fall): 1h/week on data analysis and to prepare for experiments. Not directly evaluated

U de M

- Lab 1: 2h/week on using Matlab and data analysis. Not evaluated

U de S

- Lab 1: 2h/week on data analysis and to prepare for experiments. 15% of grade

Experiment Subject

Most courses

- Experiments in various fields
- Later courses have more in depth experiments (usually modern physics) that may need calibrations, making their own procedures and more complex data analysis.

First course

- Queen's: 2 first weeks of basic electronics
- UBC (fall), U de S: Basic electronics labs

Marking

	Lab 1	Lab 2	Lab 3	Lab 4
U de M	15% prelab homework 85% lab reports	60% reports 5% lab skills evaluation 35% Midterm + Final	100% reports	
McGill	5% online prelab 70% reports 25% quizzes (2)	50% regular labs 30% project lab 20% quizzes (2)	100% reports	100% reports
U de S	5% lab prep 80% report 15% test+homework	10% lab prep 10% work quality 50% 4 reports 20% 2 oral present. 10% a data acq. Program	10% lab prep 10% work quality 80% report	70% reports (2) 10% indiv. test on experiments 20% Presentation (1)
UBC	60% Lab notebook 30% Formal report for one of the exp. at the end 10% Assignments	20% prelab assignments 40% Notebooks 20% Exam 20% formal lab report	50% per project for each project: 5% logbook 3% Lit review 10% formal discussion 20% Presentation 10% Sc. Paper style report	
Queen's	15% lab notebook 20% analysis binder (5 per semester) 40% Formal reports (2 per semester) 25% quizzes (2)	12% Lab books 26% 2 formal reports 7% Shop and electronics workshop classes 5% Project written proposal 5% Presentation of proposal 25% Project report 15% Report presentation	10% lab notebook /professional conduct /preparedness 90% Lab reports – written or oral (one teammate does a written, the other, an oral)	

Team Work

In most courses, experiments are performed in teams of 2 students
Exceptions:

- Queen's: 2nd lab – 2 to 4 students for the project
- UBC: 1st and 3rd labs – individual
- U de S: 4th lab – 2-3 students

Lab reports are

- McGill – Lab 1: Individual
  Labs 2, 3 and 4: 1 per team
- Queen's – Individual
- UBC – Individual
- U de M – Labs 1 & 3: Individual,
  Lab 2: 1 per team
- U de S – 1 per team

Software

Mandatory Matlab: McGill, U de M
Mandatory Python: UBC lab 3
Free choice:

- Queen's: Mathematica, Maple, Matlab or C
- UBC: Gnu plot, C, Mathematica
- U de S: Origin, Mathematica, Matlab

Textbook on Data Analysis

- *An Introduction to Error Analysis*, John R. Taylor
  Queen's & U de M

- *Measurements and their Uncertainties*, Hughes & Hase
  McGill

- *Introduction à la physique expérimentale*, Tremblay & Chassé
  U de S

- UBC uses lecture notes as reference

  McGill & U de M additionally suggest as reference: *Data reduction and error analysis for the physical sciences, P.* Bevington

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning
Office of the Provost and Vice-President, Academic Affairs
Chair, Academic Programs Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: January 30, 2018

SUBJECT: 2019-20 Undergraduate Calendar Curriculum Changes
School of Irish Studies
CCIS-11
Curriculum revisions relative to department name; new courses
IRST 304, 404

The Arts and Science Faculty Council has reviewed and approved the following proposal and requests that it be considered at the next meeting of APC.

Given the recent change of name, the **School of Irish Studies** is modifying the names of its programs as well as various course titles and descriptions to reflect better the activities of the School and the new name. Further, two successful slot courses are being converted to permanent courses. IRST 304 *Sexualities in the Irish Diaspora* is added to the list of program electives in History and Diaspora Studies in the Major where it fits well while IRST 404 *History and Memory in Ireland* is added as a 400-level elective to 'expand the small number of Irish Studies seminar choices available to Irish Studies majors'.

Thank you for your consideration of this proposal for which there are no additional resource implications.

Reference documents:
FCC 2017.2/U_CCIS-11
ASFC 2018-1M-B

School of Irish Studies

CCIS-11

Memo from Principal

Program Title/Changes

Major in Irish Studies

Minor in Irish Studies

Certificate in Irish Studies

Course Title and/or editorial change to description

IRST 203	*Introduction to Irish Studies*
IRST 298	*Selected Topics in Irish Studies*
IRST 299	*Selected Topics in Irish Studies* (6 credits)
IRST 390	*Field Studies in Ireland*
IRST 398	*Special Topics in Irish Studies*
IRST 399	*Special Topics in Irish Studies* (6 credits)
IRST 498	*Advanced Topics in Irish Studies*
IRST 499	*Advanced Topics in Irish Studies* (6 credits)

New Course

IRST 304	*Sexualities in the Irish Diaspora*
IRST 404	*History and Memory in Ireland*

MEMORANDUM

TO: Paul Joyce, Associate Dean, Academic Programs, Faculty of Arts and Science

FROM: Michael Kenneally, Principal, School of Irish Studies

DATE: November 30, 2017

RE: Curriculum Proposal CCIS-11

On September 8, 2017, the School of Irish Studies approved the following curriculum changes in its Departmental Meeting.

Program Changes:

Further to Senate approval to change the name of our unit from the **School of Canadian Irish Studies** to **School of Irish Studies** on December 9, 2016, we are proposing that the name of our three programs (Major, Minor and Certificate in Canadian Irish Studies) also be changed to ensure consistency.

At present the names of the programs are misleading, suggesting the focus is exclusively on the Irish in Canada. As now practiced at Concordia, Irish Studies not only explores the rich history and culture of Ireland, along with the Irish immigrant experience in Canada and elsewhere, but also considers how these subjects raise issues that have international resonances, such as colonialism and post-colonialism, migration and integration, famine, rebellion, civil war, partition, linguistic preservation, and cultural nationalism. This wider engagement is reflected in the range of courses offered in disciplines such as political science, economics, history, design, music, language, literature, theology, geography, theatre, film and performance. In practice, then, the courses in our programs are more appropriately situated under the internationally-recognized rubric of 'Irish Studies'. To signal this wider academic focus, especially for recruitment at the undergraduate and graduate levels, it is important that the ambiguity of the current program titles be clarified so that potential students clearly understand the nature and larger context of our courses.

Course changes:

We are proposing the following name changes to the following courses, relating to the removal of **Canadian** as per our program changes above:

IRST 203	Introduction to Irish Studies
IRST 298/299	Selected Topics in Irish Studies
IRST 398/399	Special Topics in Irish Studies
IRST 498/499	Advanced Topics in Irish Studies

In addition, subject to the approval of the proposed program name changes, the pre-requisite for IRST 390 (Field Studies in Ireland) that students would have to be in an Irish Studies program would need to be modified to reflect this.

Finally, we are proposing the inclusion of two new courses that have been previously taught over several years as slot courses: i) **Sexualities in the Irish Diaspora** and ii) **History and Memory in Ireland**. The Sexualities in the Irish Diaspora course would expand the choices offered in the History and Diaspora stream of the Major and the History and Memory in Ireland course would expand our 400-level offerings. Both courses are now taught on a regular basis by tenured faculty.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

PROGRAM CHANGE: Name Change - Major

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:
[X] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2017/2018) calendar	**Proposed Text**
42 BA Major in ~~Canadian~~ Irish Studies *Stage I* 12 IRST 203[3], 209[3]; IRST 210[3]/HIST 212[3]; IRST/HIST 211[3] 3 Film, Theatre, Music, Performance: IRST 270[3], 343[3], 344[3], 346[3], 347[3], 371[3], 373[3] *Stage II* 3 IRST 300[3] 3 History and Diaspora Studies: IRST 303[3]; IRST 312[3]/HIST 330[3]; IRST 314[3], 315[3], 316[3] 3 Literature: ENGL 353[3], 355[3], 356[3], 357[3], 358[3], 359[3]; IRST 354[3] 3 Film, Theatre, Music, Performance: IRST 343[3], 344[3], 346[3], 347[3], 371[3], 373[3] *Stage III* 3 400-level IRST elective credits 12 IRST elective credits at the 200, 300 or 400 level chosen in consultation with the ~~Canadian~~ Irish Studies advisor. At least nine credits must be at the 300 or 400 level	**42 BA Major in Irish Studies** *Stage I* 12 IRST 203[3], 209[3]; IRST 210[3]/HIST 212[3]; IRST/HIST 211[3] 3 Film, Theatre, Music, Performance: IRST 270[3], 343[3], 344[3], 346[3], 347[3], 371[3], 373[3] *Stage II* 3 IRST 300[3] 3 History and Diaspora Studies: IRST 303[3], 304[3]; IRST 312[3]/HIST 330[3]; IRST 314[3], 315[3], 316[3] 3 Literature: ENGL 353[3], 355[3], 356[3], 357[3], 358[3], 359[3]; IRST 354[3] 3 Film, Theatre, Music, Performance: IRST 343[3], 344[3], 346[3], 347[3], 371[3], 373[3] *Stage III* 3 400-level IRST elective credits 12 IRST elective credits at the 200, 300 or 400 level chosen in consultation with the Irish Studies advisor. At least nine credits must be at the 300 or 400 level

Rationale:
Further to Senate approval to change the name of our unit from School of Canadian Irish Studies to School of Irish Studies on December 9, 2016, changing the name of our programs would be an appropriate next step. As with the unit change, this change will:

- Indicate more accurately the wider academic and research activities of the School.
- Better situate the School in the context of Irish Studies globally, thereby enhancing its growing international reputation.
- More readily lead electronic search engines to its website, and direct individual enquiries to the School, its programs and courses.

- Help to recruit more undergraduate students due to the wider, global orientation to Irish Studies the new name implies.

For recruitment purposes, it is important that the ambiguity of the present name be removed so that potential new students will understand clearly the nature and range of the courses available. This clarity is especially desirable for an interdisciplinary area of study that is not readily recognised outside an academic environment.

IRST 304 fits well in the History and Diaspora Studies stream in the Major. This popular course is being added to increase the number of choices within this stream.

Resource Implications:
None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

PROGRAM CHANGE: Name Change - Minor

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Minor in Irish Studies
Degree:
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[X] Editorial [ ] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2017/2018) calendar	**Proposed Text**
24 Minor in ~~Canadian~~ Irish Studies 12 IRST 203[3], 209[3]; IRST/HIST 211[3]; IRST 270[3] 12 IRST elective credits	**24 Minor in Irish Studies** 12 IRST 203[3], 209[3]; IRST/HIST 211[3]; IRST 270[3] 12 IRST elective credits

Rationale:
Further to Senate approval to change the name of our unit from School of Canadian Irish Studies to School of Irish Studies on December 9, 2016, changing the name of our programs would be an appropriate next step. As with the unit change, this change will:

- Indicate more accurately the wider academic and research activities of the School.
- Better situate the School in the context of Irish Studies globally, thereby enhancing its growing international reputation.
- More readily lead electronic search engines to its website, and direct individual enquiries to the School, its programs and courses.
- Help to recruit more undergraduate students due to the wider, global orientation to Irish Studies the new name implies.

For recruitment purposes, it is important that the ambiguity of the present name be removed so that potential new students will understand clearly the nature and range of the courses available. This clarity is especially desirable for an interdisciplinary area of study that is not readily recognised outside an academic environment.

Resource Implications:
None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

PROGRAM CHANGE: Name Change - Certificate

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Certificate in Irish Studies
Degree: Certificate
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[X] Editorial [ ] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2017/2018) calendar	**Proposed Text**
30 Certificate in ~~Canadian~~ Irish Studies 15 IRST 203[3], 209[3]; IRST/HIST 211[3]; IRST 270[3], 303[3] 15 IRST elective credits	**30 Certificate in Irish Studies** 15 IRST 203[3], 209[3]; IRST/HIST 211[3]; IRST 270[3], 303[3] 15 IRST elective credits

Rationale:
Further to Senate approval to change the name of our unit from School of Canadian Irish Studies to School of Irish Studies on December 9, 2016, changing the name of our programs would be an appropriate next step. As with the unit change, this change will:

- Indicate more accurately the wider academic and research activities of the School.
- Better situate the School in the context of Irish Studies globally, thereby enhancing its growing international reputation.
- More readily lead electronic search engines to its website, and direct individual enquiries to the School, its programs and courses.
- Help to recruit more undergraduate students due to the wider, global orientation to Irish Studies the new name implies.

For recruitment purposes, it is important that the ambiguity of the present name be removed so that potential new students will understand clearly the nature and range of the courses available. This clarity is especially desirable for an interdisciplinary area of study that is not readily recognised outside an academic environment.

Resource Implications:
None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 203 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number	[X] Course Title	[ ] Credit Value	[ ] Prerequisite
[X] Course Description	[ ] Editorial	[ ] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 2017/2018) calendar	**Proposed Text**
IRST 203 ***Introduction to ~~Canadian~~ Irish Studies*** (3 credits) This course is a multidisciplinary introduction to the field of ~~Canadian~~ Irish studies, a discipline that embraces a broad range of historical and contemporary issues as they have manifested themselves on the island of Ireland, in Canada and throughout the world. In particular, questions related to individual and national identities in the context of history, language, culture, landscape, and religion are explored and debated.	**IRST 203** ***Introduction to Irish Studies*** (3 credits) This course is a multidisciplinary introduction to the field of Irish studies, a discipline that embraces a broad range of historical and contemporary issues as they have manifested themselves on the island of Ireland, in Canada and throughout the world. In particular, questions related to individual and national identities in the context of history, language, culture, landscape, and religion are explored and debated.

Rationale:
The new title and description is more reflective of what is actually covered in the course and the discipline as a whole. It is also in line with our recent unit name change and our proposed program name changes.

Resource Implications:
None

Other Programs within which course is listed:

None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 298 / IRST 299 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number	[X] Course Title	[ ] Credit Value	[ ] Prerequisite
[ ] Course Description	[ ] Editorial	[ ] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 2017/2019) calendar	**Proposed Text**
IRST 298 ***Selected Topics in ~~Canadian~~ Irish Studies*** (3 credits) **IRST 299** ***Selected Topics in ~~Canadian~~ Irish Studies*** (6 credits) Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.	**IRST 298** ***Selected Topics in Irish Studies*** (3 credits) **IRST 299** ***Selected Topics in Irish Studies*** (6 credits) Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

Rationale:
As in the changes in the names of our programs, these title changes are more reflective of the broad range of our offerings.

Resource Implications:
None

Other Programs within which course is listed:

None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 304 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	IRST 304 ***Sexualities in the Irish Diaspora*** (3 credits) This course investigates the rich history that sex and sexual identities have played in shaping the Irish Diaspora over the past two hundred years. Representations of Irish sexualities and gendered expectations have been a controversial constant in the story of the Irish abroad and their descendants in the global Irish Diaspora. Key themes may include marriage and divorce, homosexuality, asexuality, racism, virginity, media scandals, heroism, alcoholism, sexual assault, nationalism, propaganda, punishment, gender-bending, and religion. *NOTE: Students who have received credit for this topic under an ANTH 398 , HIST 398, IRST 398 or SOCI 398 number may not take this course for credit.*

Rationale:
This has been a popular course with undergraduate students, expanding our offerings in the History and Irish Diaspora stream within our Major. It is also listed under IRST 398B as part of the 2017-18 approved electives for the Interdisciplinary Minor in Sexuality.

As this course has been cross-listed with topics courses in Anthropology, Sociology and History (ANTH/SOCI 398, HIST 398), students in those programs may be able to take this as an elective.

Enrolment:
2013/14: 45/50
2014/15: 45/55
2017/18: 38/58

Resource Implications:
None. The course will be offered as part of our existing allotment.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 390 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [X] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 2017/2018) calendar	**Proposed Text**
IRST 390 ***Field Studies in Ireland*** (3 credits) Prerequisite: Enrolment in a program in ~~Canadian~~ Irish Studies, submission of a detailed proposal and permission of the School. This course is designed to allow students to conduct focused study of a given subject (e.g. literature, history, language, music, film) in an Irish context. The experience in Ireland may be in the context of a structured school environment or may take the form of a more independent exploration. Based upon preparatory readings and assignments done at Concordia, students enrich their learning experience in Ireland, followed by assignments completed upon their return to Concordia. All course content and requirements are established in consultation with the School. *NOTE: Students may take this course two times for credit provided the subject matter is different.*	**IRST 390** ***Field Studies in Ireland*** (3 credits) Prerequisite: Enrolment in a program in Irish Studies, submission of a detailed proposal and permission of the School. This course is designed to allow students to conduct focused study of a given subject (e.g. literature, history, language, music, film) in an Irish context. The experience in Ireland may be in the context of a structured school environment or may take the form of a more independent exploration. Based upon preparatory readings and assignments done at Concordia, students enrich their learning experience in Ireland, followed by assignments completed upon their return to Concordia. All course content and requirements are established in consultation with the School. *NOTE: Students may take this course two times for credit provided the subject matter is different.*

Rationale:
Subject to approval of our proposed program name changes, clarifying the prerequisite would also become necessary.

Resource Implications:
None.

Other Programs within which course is listed:

None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 398 / IRST 399 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number [X] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 2017/2018) calendar	**Proposed Text**
IRST 398 ***Special Topics in ~~Canadian~~ Irish Studies*** (3 credits) **IRST 399** ***Special Topics in ~~Canadian~~ Irish Studies*** (6 credits) Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.	**IRST 398** ***Special Topics in Irish Studies*** (3 credits) **IRST 399** ***Special Topics in Irish Studies*** (6 credits) Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

Rationale:
As in the changes in the names of our programs, these title changes are more reflective of the broad range of our offerings.

Resource Implications:
None

Other Programs within which course is listed:

None

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 404 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	IRST 404 ***History and Memory in Ireland*** (3 credits) Prerequisite: IRST 211 and 21 credits in Irish Studies; or permission of the Department. This seminar explores the complex and politically-charged relationship between history and memory in modern Ireland in the contexts of politics, popular culture, commemoration practices, and scholarship. Drawing on the insights offered by the interdisciplinary field of memory studies, it explores the interactions between past and present and memory and forgetting by tracing the ways key historical events have been historicized, revised, commemorated, and otherwise remembered (and silenced) over time by nationalists, unionists, 'exiles', and other 'communities of memory' in Ireland and among the Irish Diaspora. Possible memory case studies include the 1641 Rebellion; the Williamite War; the 1798 Rising; the Great Famine; the First World War and the events of the Irish Revolution; the Northern Irish 'Troubles"; and Church-State institutional abuse in independent Ireland. *NOTE: Students who have received credit for this topic under an IRST 398 or 498 number may not take this course for credit.*

Rationale:
This course would expand the small number of Irish Studies seminar choices available to Irish Studies Majors, all of whom are required to take one 400-level seminar. Additionally, given the inherently interdisciplinary nature of memory studies, the course reinforces the programme's commitment to interdisciplinarity, while it also helps to service History Honours and Masters' students in need of seminar course work.

Enrolment figures:
2011-12 (IRST 398): 20/20
2013-14 (IRST 398):15/20
2016-17 (IRST 498):13/20

Resource Implications:
None. The course will be offered as part of our existing allotment.

Other Programs within which course is listed: None.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CCIS-11** VERSION: 2

COURSE CHANGE: IRST 498 / IRST 499 New Course Number:

Proposed [X] Undergraduate or [ ] Graduate Curriculum Changes

Calendar for academic year: 2019/2020
Implementation Month/Year: May 2018

Faculty/School: Arts and Science
Department: School of Irish Studies
Program: Major, Minor, Certificate in Irish Studies
Degree: BA
Calendar Section/Graduate Page Number: 31.530

Type of Change:

[ ] Course Number	[X] Course Title	[ ] Credit Value	[ ] Prerequisite
[ ] Course Description	[ ] Editorial	[ ] New Course	
[ ] Course Deletion	[ ] Other - Specify:		

Present Text (from 2017/2018) calendar	**Proposed Text**
IRST 498 ***Advanced Topics in ~~Canadian~~ Irish Studies*** (3 credits) **IRST 499** ***Advanced Topics in ~~Canadian~~ Irish Studies*** (6 credits) Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.	**IRST 498** ***Advanced Topics in Irish Studies*** (3 credits) **IRST 499** ***Advanced Topics in Irish Studies*** (6 credits) Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

Rationale:
As in the changes in the names of our programs, these title changes are more reflective of the broad range of our offerings.

Resource Implications:
None.

Other Programs within which course is listed:

None.

UNIVERSITÉ Concordia UNIVERSITY

FACULTY OF FINE ARTS

INTERNAL MEMORANDUM

TO: Dr. Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning; Chair, Academic Programs Committee

FROM: Dr. Rebecca Duclos, Dean, Faculty of Fine Arts

CC: Ms. Olivia Ward, University Curriculum Administrator, Office of the Provost
Dr. Mark Sussman, Associate Dean, Academic Affairs, Faculty of Fine Arts

DATE: January 15, 2018

RE: Curriculum Dossier for the Department of Cinema, CINE-24

As Dean of the Faculty of Fine Arts, I fully support the curriculum changes proposed in CINE-24. The dossier was reviewed and unanimously approved by the Fine Arts Faculty Council at its meeting on December 15, 2017.

There are no resource implications.

Rebecca Duclos
Dean, Faculty of Fine Arts
Rebecca.Duclos@concordia.ca
848-2424 ext. 4602

FACULTY OF FINE ARTS

Internal Memorandum

To: Rebecca Duclos, Dean, Faculty of Fine Arts

From: Mark Sussman, Associate Dean, Academic Affairs

Date: December 1, 2017

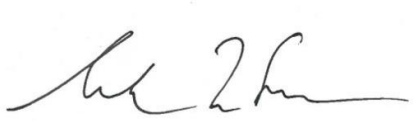
Re: Curriculum dossier, Department of Cinema, CINE-24

The Faculty of Fine Arts Curriculum Committee has reviewed and unanimously approved the CINE-24 curriculum dossier from the Department of Cinema. We hereby submit this dossier for review at Faculty Council on December 15, 2017.

This document makes a number of small modifications to requirements for BFA Specialization in Film Studies, and changes to course descriptions for FMST 214 and FMST 217.

There are no resource implications.

With thanks for your consideration.



Mark Sussman, PhD
Associate Dean, Academic Affairs
Faculty of Fine Arts
mark.sussman@concordia.ca

Concordia University
Fine Arts
The Mel Hoppenheim
School of Cinema

To: Rebecca Duclos, Dean, Faculty of Fine Arts

Mark Sussman, Associate Dean, Academic Affairs, Faculty of Fine Arts

From: Catherine Russell, Chair, Mel Hoppenheim School of Cinema

Date: October 17, 2017

Subject: Film Studies Curriculum Changes

The attached curriculum documents are designed to introduce a change to the program requirements for the Specialization in Film Studies, along with changes to the title and description of two Film Studies Courses. These changes will bring the Specialization program more in line with the Major in Art History and Film Studies, which includes FMST 217 (presently called "First Nations and Film" 3 credits) in a cluster of courses that includes FMST 215 ("Le cinéma québécois" 3 credits) and FMST 214 (presently called "English-Canadian Film" 3 credits). Students are required to select 6 credits from that cluster. We would like to add this requirement to the Specialization in Film Studies so that we can offer the three courses in a regular rotation and ensure that Indigenous Cinema is equally represented alongside the other two courses in our curriculum.

In order to decolonize language, we have proposed changing the title of FMST 217 to "First Peoples' Cinema," and have provided a new course description. We have removed the word "English" from the course that covers cinema produced outside Quebec so as to better represent the diversity of Canadian cinema.

This rationale was clearly explained and unanimously supported by Cinema's School Council at its meeting on September 29, 2017.

UNIVERSITÉ Concordia UNIVERSITY
1455 De Maisonneuve Blvd. West, FB 319, Montreal, Quebec, Canada H3G 1M8 cinema.concordia.ca
Tel 514-848-2424 ext. 4666 Fax 514-848-4255 cinema@concordia.ca

Concordia University
Fine Arts
The Mel Hoppenheim
School of Cinema

Sincerely,

Catherine Russell

Chair, Mel Hoppenheim School of Cinema
Faculty of Fine Arts, Concordia University
1455 de Maisonneuve Blvd. West, Suite FB 319
Montreal, Quebec, Canada H3G 1M8
Tel.: 514 848 2424 ext. 4798
Fax: 514 848 4255

DOSSIER TITLE: **CINE-24 v3**

DESCRIPTION OF CHANGE: **Change in Requirements for Specialization in Film Studies**

PROGRAM CHANGE - CALENDAR UPDATE FORM – *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2019/2020

Proposed [x] Undergraduate or [ ] Graduate Curriculum Changes **Implementation Month/Year:** September 2018

Faculty: Fine Arts **Department: Cinema**

Program: Specialization in Film Studies **Degree: BFA** **Section Title:** 81.60

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Editorial [x] Requirements [ ] Regulations
[ ] New Program [ ] Program Deletion

Present Text (Text from 2017– 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
66 BFA Specialization in Film Studies *NOTE: It is strongly recommended that students in the Specialization in Film Studies have, or acquire, a knowledge of French.*	**66 BFA Specialization in Film Studies** *NOTE: It is strongly recommended that students in the Specialization in Film Studies have, or acquire, a knowledge of French.*
*21 FMST 211[6], 212[6], 216[3], 322[6]	*21 FMST 211[6], 212[6], 216[3], 322[6]
3 Chosen from FMST 214[3], 215[3]	3 Chosen from FMST 214[3], 215[3], 217[3]
6 Chosen from FMST 315[3], 316[3], 317[3], 319[3], 320[3]	6 Chosen from FMST 315[3], 316[3], 317[3], 319[3], 320[3]
3 Chosen from FMST 418[3], 419[3]***	3 Chosen from FMST 418[3], 419[3]***
6 FMPR 231[6] or Cinema Electives**** approved by the head of Film Studies	6 FMPR 231[6] or Cinema Electives**** approved by the head of Film Studies
3 FMST 450[3]	3 FMST 450[3]
21 Film Studies electives** (excluding FMST 200); FMPR 341[3], 441[3]	21 Film Studies electives** (excluding FMST 200); FMPR 341[3], 441[3]
3 Film Studies seminar credtis chosen in consultation with an advisor	3 Film Studies seminar credtis chosen in consultation with an advisor

Rationale:

At present, the BFA Major in Art History and Film Studies requires its students to choose three credits (one course) from the following:

FMST 214 English-Canadian Film
FMST 215 Le cinéma québécois
FMST 217 First Nations and Film

The proposal is to bring these same requirements to the Specialization in Film Studies, which currently asks students to select one course out of only 214 and 215. This change aligns the requirements for the Specialization in Film Studies with the current requirements of the Major in Art History and Film Studies. Offering the three courses in rotation would enable us to offer FMST 217 regularly and enable Specialization students to meet their degree requirements.

Resource Implications: None

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: CINE-24 v3
COURSE NUMBER: FMST 214
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2019/2020
Proposed [x] Undergraduate or [ ] Graduate Curriculum Changes **Implementation Month/Year:** September 2018
Faculty: Fine Arts **Department: Cinema**

Program: Film Studies **Degree: BFA** **Section Title:** 81.60

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [x] Course Title [ ] Credit Value [ ] Prerequisite [x] Course Description
[ ] Editorial [ ] Other - Specify: [ ] New Course [ ] Course Deletion

Present Text (Text from 2017 – 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
FMST 214 ~~*English-Canadian Film*~~ (3 credits) A survey of ~~English~~ Canadian film from the earliest surviving works to the present. Topics include fiction~~al~~, documentary, animat~~ed~~, and experimental film, ~~and~~ the role of the National Film Board ~~is discussed~~. Weekly screenings.	**FMST 214** *Canadian Cinema* (3 credits) A survey of Canadian film from the earliest surviving works to the present. Topics include fiction, documentary, animation, and experimental film, as well as the role of the National Film Board. The course includes discussions of national and transnational cinema within the Canadian context. Weekly Screenings.

Rationale:
Canadian Cinema includes filmmaking in many languages in addition to English. The term "cinema" includes all moving image practices in addition to the medium-specific term "film". This change aligns with a previous change to the title of FMST 418, 'Seminar in Canadian Cinema', with the rationale to better indicate the multicultural and multi-linguistic materials under analysis.
Resource Implications: none
Other Programs within which course is listed: BFA Art History and Film Studies, Specialization in Film Studies, section 71.110 of "Complementary Studies for Engineering and Computer Science Students".

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: CINE-24 v3
COURSE NUMBER: FMST 217
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2019/2020
Proposed [x] Undergraduate or [ ] Graduate Curriculum Changes **Implementation Month/Year:** September 2018
Faculty: Fine Arts **Department: Cinema**

Program: Film Studies **Degree: BFA** **Section Title:** 81.60

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [x] Course Title [ ] Credit Value [ ] Prerequisite [x] Course Description
[ ] Editorial [x] Other - Specify: Removal of exclusion note [ ] New Course [ ] Course Deletion

Present Text (Text from 2017– 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
FMST 217 ~~*First Nations and Film*~~ (3 credits) ~~A survey~~ of representation by and of ~~aboriginal~~ peoples in film and video. The emphasis is on the Americas, but important works from other continents are included. Films and ~~videotapes~~, both mainstream and experimental, are discussed in the context of ~~contemporary aesthetic issues, socio-cultural history, and~~ post-colonial theory. Weekly screenings. ~~*NOTE: Students who have received credit for FMST 398H may not take this course for credit.*~~	**FMST 217** *First Peoples' Cinema* (3 credits) An examination of representation by and of indigenous peoples in film and video. The emphasis is on Turtle Island and other parts of the Americas, but important works from other continents may be included. Films and videos, both mainstream and experimental, are discussed in the context of post-colonial theory, socio-cultural history, and contemporary aesthetic issues. Weekly screenings.

Rationale:
The proposed new wording and course description reflects contemporary discourse on and around First Peoples' culture while avoiding colonialist geographical nomenclature. Removal of the exclusion note, which pertains to a course that has not been taught since the summer of 1993.

Resource Implications: none

Other Programs within which course is listed: BFA Major in Art History and Film Studies

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

Concordia University
School of Graduate Studies

MEMO TO: Sandra Gabriele, Vice-Provost Teaching and Learning

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: January 5, 2018

SUBJECT: **GRADUATE CURRICULUM CHANGES (JOUR-7)**
(CALENDAR – 2018/2019)
DEPARTMENT OF JOURNALISM
FACULTY OF ARTS AND SCIENCE

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Arts and Science Faculty Council.

The Department of Journalism is proposing to make minor modifications to the elective options of their M.A. in Digital Innovation in Journalism.

The GCC approved the proposed curriculum changes with one minor modification. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: P. Joyce, Associate Dean, Academic Programs, Faculty of Arts and Science
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Bradley Nelson
Associate Dean, School of Graduate Studies
Chair, Graduate Curriculum Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: November 17, 2017

SUBJECT: Graduate Calendar Curriculum Changes
Department of Journalism
JOUR-7
Master of/Magisteriate in Arts (Digital Innovation in Journalism Studies); new course JOUR 642 Special Topics in Journalism Studies

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The Arts and Science Faculty Council has reviewed and approved the following proposal and requests that it be considered at the next meeting of the Graduate Curriculum Committee.

As a follow up to the changes defining the M.A. in Digital Innovation in Journalism (Senate document US-2017-3-D11) the **Department of Journalism** is making some minor modifications to the programme's elective options. Specifically, JOUR 523 News and Feature Photography, an existing course in the Diploma in Visual Journalism, and one new course, JOUR 642 Special Topics in Journalism Studies, are added as program electives to the MA program. Finally, a note is added to allow students who enter the MA program with substantial journalism experience or education to take up to six 600-level elective credits outside the Department of Journalism. Taken together these changes "provide students with more elective options than are currently offered in the M.A. program structure and will facilitate a more manageable timeline in which they may finish their program coursework".

Thank you for your consideration of this proposal for which there are no additional resource implications as the one new course will be offered as part of the Department's existing course allotment.

Reference documents:
FCC 2017.1/JOUR-7
ASFC 2017-6M-C_JOUR-7

Department of Journalism

JOUR-7

Memo from Chair and MA Program Director

Program Changes

Master of/Magisteriate in Arts (Digital Innovation in Journalism Studies)

New Course

JOUR 642 Special Topics in Journalism Studies

UNIVERSITÉ Concordia UNIVERSITY

FACULTY OF ARTS AND SCIENCE

Department of Journalism

MEMORANDUM

To:	Paul Joyce, Associate Dean, Academic Programs, Arts and Sciences
From:	David Secko, Chair, Department of Journalism Brian Gabrial, M.A. Program Director, Department of Journalism
Re:	Minor curriculum changes to the M.A. in Digital Innovation in Journalism Studies
Date:	27 September 2017; revised 23 October 2017

On September 27, 2017, faculty members in the Department of Journalism voted unanimously to approve the following curriculum changes to the M.A. in Digital Innovation in Journalism Studies program.

Briefly, Senate approved the Department's revised M.A. in Digital Innovation in Journalism Studies on April 21, 2017. In August, the Department undertook a soft launch of the program and admitted four students in Fall 2017. Upon immediate review of the program's current elective offerings, the Department requests minor curriculum changes to provide students with more elective options:

JOUR 523 News and Feature Photography (3 credits)
This workshop course covers a range of journalistic topics – hard news, general news, features, arts, sports – to emphasize the thematic particularities of visual story-telling. The course requires students to consider and incorporate the narrative and representative dimensions of visual journalism through a variety of assignments.

Rationale:
The current program of study indicates that JOUR 503 Introduction to Visual Journalism may be taken as an elective. However, recently approved changes to the Diploma in Visual Journalism's curriculum moved this from a required course in that program to an elective. This course will no longer be offered every year. Instead, JOUR 523 is now required in our Diploma in Visual Journalism and will be offered each year. As such, to ensure the Department has a diversity of electives each year, we recommend JOUR 523, which requires no prerequisite, be added to the M.A. program electives list to complement JOUR 503.

JOUR 642 Special Topics in Journalism Studies (3 credits)
This seminar permits the in-depth examination of particular special topics in digital innovation in journalism studies. Topics will vary from year to year.

7141 Sherbrooke St. W., Montreal, Quebec, Canada H4B 1R6
Tel. 514-848-2424 concordia.ca

Rationale:
The addition of this course to the M.A. curriculum provides M.A. students with another elective option. In addition, the new course provides the Department with flexibility to mount a special topics course that may attract graduate students from other disciplines.

Additionally, the Department would like to add the following line in the calendar to give students who have substantial journalism experience or education more elective options.

With the permission of the department, up to six elective credits may be taken in 600-level courses offered by other departments.

Resource implications for the changes:
None. JOUR 523 and 642 will be offered as part of the Department's existing course allotment.

Dr. David Secko
Chair

Dr. Brian Gabrial
M.A. Program Director

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **JOUR-7** VERSION: 3

PROGRAM CHANGE: MA courses additions

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: Fall 2018

Faculty/School: Arts and Science
Department: Journalism
Program: Digital Innovation in Journalism Studies
Degree: MA
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[ ] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2017/2018) calendar	Proposed Text
Master of/Magisteriate in Arts (Digital Innovation in Journalism Studies) **Admission Requirements.** The normal requirement for admission into the MA is an undergraduate degree with a minimum GPA of 3.00 on a 4.30 scale. Applicants should understand that admission to the program is contingent on a sound undergraduate academic record, strong letters of reference, and a convincing statement of purpose which clearly describes their academic interest in the program and intended area of research. Applicants who do not meet the standards for admission may be required to complete a qualifying program of up to 12 undergraduate credits in addition to the regular graduate program. For the qualifying program a minimum grade point average of 3.00 (*B* average) is required. **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the Graduate Admission page for further information on the Language Proficiency requirements and exemptions. **Requirements for the Degree** 1. **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits. The requirements include three core program courses. 2. **Courses.** Students are required to complete 15 credits of coursework, as well as one of the three options for research requirements listed below. The following core courses are required:	**Master of/Magisteriate in Arts (Digital Innovation in Journalism Studies)** **Admission Requirements.** The normal requirement for admission into the MA is an undergraduate degree with a minimum GPA of 3.00 on a 4.30 scale. Applicants should understand that admission to the program is contingent on a sound undergraduate academic record, strong letters of reference, and a convincing statement of purpose which clearly describes their academic interest in the program and intended area of research. Applicants who do not meet the standards for admission may be required to complete a qualifying program of up to 12 undergraduate credits in addition to the regular graduate program. For the qualifying program a minimum grade point average of 3.00 (*B* average) is required. **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the Graduate Admission page for further information on the Language Proficiency requirements and exemptions. **Requirements for the Degree** 1. **Credits.** A fully qualified candidate is required to complete a minimum of 45 credits. The requirements include three core program courses. 2. **Courses.** Students are required to complete 15 credits of coursework, as well as one of the three options for research requirements listed below. The following core courses are required:

JOUR 601 Critical Approaches to Journalistic Thought (3 credits)
JOUR 604 Research Methods for Journalism (3 credits)
JOUR 605 Digital Innovation in Journalism (3 credits)

Choose two of the following elective courses:
JOUR 502 Introduction to Reporting (3 credits)
JOUR 503 Introduction to Visual Journalism (3 credits)
JOUR 511 Introduction to Multimedia (3 credits)
JOUR 603 Political Economy of Journalism (3 credits)
JOUR 610 International Journalism (3 credits)
JOUR 620 Journalism Ethics and the Law (3 credits)
JOUR 630 Mediating Diversity through Audio Story-telling (3 credits)
JOUR 640 Textual Approaches to Journalism (3 credits)
JOUR 645 Directed Study (3 credits)

3. **Research Requirements and Options.**

Option A.
JOUR 650 Journalism Readings and Proposal (6 credits)
JOUR 691 Thesis (24 credits)
OR
Option B.
JOUR 650 Journalism Readings and Proposal (6 credits)
JOUR 693 Research-Creation Thesis (24 credits)
OR
Option C.
JOUR 694 Essay (18 credits)
12 additional course credits in consultation with the student's faculty advisor and approved by the Department's MA program director. ~~If approved, up to 6 credits can be taken outside the Department.~~

Academic Regulations

1. **Academic Standing.** Please refer to the Academic Standing section of the Calendar for a detailed review of the Academic Regulations.

2. **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study

3. **Time Limit.** Please refer to the Academic Regulation page for further details regarding the Time Limit requirements.

4. **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

JOUR 601 Critical Approaches to Journalistic Thought (3 credits)
JOUR 604 Research Methods for Journalism (3 credits)
JOUR 605 Digital Innovation in Journalism (3 credits)

Choose two of the following elective courses*:
JOUR 502 Introduction to Reporting (3 credits**)**
JOUR 503 Introduction to Visual Journalism (3 credits)
JOUR 511 Introduction to Multimedia (3 credits)
JOUR 523 News and Feature Photography (3 credits)
JOUR 603 Political Economy of Journalism (3 credits**)**
JOUR 610 International Journalism (3 credits)
JOUR 620 Journalism Ethics and the Law (3 credits)
JOUR 630 Mediating Diversity through Audio Story-telling (3 credits)
JOUR 640 Textual Approaches to Journalism (3 credits)
JOUR 642 Special Topics in Journalism Studies (3 credits)
JOUR 645 Directed Study (3 credits)

*** With the permission of the department, up to six elective credits may be taken in 600-level courses offered by other departments.**

3. **Research Requirements and Options.**

Option A.
JOUR 650 Journalism Readings and Proposal (6 credits)
JOUR 691 Thesis (24 credits)
OR
Option B.
JOUR 650 Journalism Readings and Proposal (6 credits)
JOUR 693 Research-Creation Thesis (24 credits)
OR
Option C.
JOUR 694 Essay (18 credits)
12 additional course credits in consultation with the student's faculty advisor and approved by the Department's MA program director.

Academic Regulations

1. **Academic Standing.** Please refer to the Academic Standing section of the Calendar for a detailed review of the Academic Regulations.

2. **Residence.** The minimum residence requirement is one year (3 terms) of full-time study, or the equivalent in part-time study

3. **Time Limit.** Please refer to the Academic Regulation page for further details regarding the Time Limit requirements.

4. **Graduation Requirement.** In order to graduate, students must have a cumulative GPA of at least 3.00.

Courses	Courses
JOUR 502 Introduction to Reporting (3 credits) This is a comprehensive lecture/laboratory course which lays the foundations for the writing and reporting demands of journalism. Students learn how to do library and archival research; structure and conduct interviews; write news and feature stories for print and digital outlets, and work under stringent deadlines. Students receive assignments both in class and in the field.	**JOUR 502 Introduction to Reporting** (3 credits) This is a comprehensive lecture/laboratory course which lays the foundations for the writing and reporting demands of journalism. Students learn how to do library and archival research; structure and conduct interviews; write news and feature stories for print and digital outlets, and work under stringent deadlines. Students receive assignments both in class and in the field.
JOUR 503 Introduction to Visual Journalism (3 credits) This workshop course lays the foundation for the visual aspects of journalistic story-telling. Working with digital, single-lens reflex cameras, students acquire fundamental skills for the practice of visual journalism, becoming familiar with a variety of aesthetic, technical, ethical and theoretical concerns involved in the visual production of meaning.	**JOUR 503 Introduction to Visual Journalism** (3 credits) This workshop course lays the foundation for the visual aspects of journalistic story-telling. Working with digital, single-lens reflex cameras, students acquire fundamental skills for the practice of visual journalism, becoming familiar with a variety of aesthetic, technical, ethical and theoretical concerns involved in the visual production of meaning.
JOUR 511 Introduction to Multimedia (3 credits) This course is an introduction to the use of technology across audio and visual news platforms, including audio, visual and digital equipment and software. Students learn the necessary professional, technical and aesthetic skills to produce editorially sound audio and visual stories.	**JOUR 511 Introduction to Multimedia** (3 credits) This course is an introduction to the use of technology across audio and visual news platforms, including audio, visual and digital equipment and software. Students learn the necessary professional, technical and aesthetic skills to produce editorially sound audio and visual stories.
	JOUR 523 News and Feature Photography (3 credits) This workshop course covers a range of journalistic topics – hard news, general news, features, arts, sports – to emphasize the thematic particularities of visual story-telling. The course requires students to consider and incorporate the narrative and representative dimensions of visual journalism through a variety of assignments.
JOUR 601 Critical Approaches to Journalistic Thought (3 credits) This course introduces students to a scholarly critique of journalism, both as a practice and as an institution. Students examine specific readings from an overlapping social, political and economic context to consider the role of journalists as cultural producers.	**JOUR 601 Critical Approaches to Journalistic Thought** (3 credits) This course introduces students to a scholarly critique of journalism, both as a practice and as an institution. Students examine specific readings from an overlapping social, political and economic context to consider the role of journalists as cultural producers.
JOUR 603 Political Economy of Journalism (3 credits) This course considers journalism through its organization as a cultural industry and critically evaluates journalism's economic structures and the impact those structures have on journalism practice. Topics may include media economics, free-market theory, media ownership, the role of the government and the role of organized labour.	**JOUR 603 Political Economy of Journalism** (3 credits) This course considers journalism through its organization as a cultural industry and critically evaluates journalism's economic structures and the impact those structures have on journalism practice. Topics may include media economics, free-market theory, media ownership, the role of the government and the role of organized labour.
JOUR 604 Research Methods for Journalism (3 credits) This course examines a variety of research methods commonly used in the production and study of journalism, from both qualitative and quantitative perspectives. Emphasis is placed on primary sources, access to information requests, and electronic databases with a goal of helping students develop their own research practice.	**JOUR 604 Research Methods for Journalism** (3 credits) This course examines a variety of research methods commonly used in the production and study of journalism, from both qualitative and quantitative perspectives. Emphasis is placed on primary sources, access to information requests, and electronic databases with a goal of helping students develop their own research practice.
JOUR 605 Digital Innovation in Journalism (3 credits) This course offers lectures and workshops in digital innovation and web design, with a focus on design features related to journalism production and news platforms.	**JOUR 605 Digital Innovation in Journalism** (3 credits) This course offers lectures and workshops in digital innovation and web design, with a focus on design features related to journalism production and news platforms.
JOUR 610 International Journalism (3 credits) *Prerequisite:* JOUR 601 previously or concurrently. This course examines journalism as a cross-cultural and global practice, addressing such	**JOUR 610 International Journalism** (3 credits) *Prerequisite:* JOUR 601 previously or concurrently. This course examines journalism as a cross-cultural and global practice, addressing such

issues as media representation, multiculturalism, globalization and international news flows.	issues as media representation, multiculturalism, globalization and international news flows.
JOUR 620 Journalism Ethics and the Law (3 credits) *Prerequisite:* JOUR 601 previously or concurrently or permission of the program director. This course examines the journalist's responsibility in terms of both ethics and the law. It introduces students to a representative cross-section of ethical theories and codes and takes an intensive look at the most common legal issues affecting the practice of journalism.	**JOUR 620 Journalism Ethics and the Law** (3 credits) *Prerequisite:* JOUR 601 previously or concurrently or permission of the program director. This course examines the journalist's responsibility in terms of both ethics and the law. It introduces students to a representative cross-section of ethical theories and codes and takes an intensive look at the most common legal issues affecting the practice of journalism.
JOUR 630 Mediating Diversity through Audio Story-telling (3 credits) *Prerequisite:* JOUR 601 previously or concurrently or permission of the program director. The course is an experiential workshop that blends journalism theory and practice. Students function both as reporters, in order to learn the skills necessary to produce robust audio stories, and digital researchers tasked with examining diversity and media representation issues arising in class to explore journalism's mediating function in society.	**JOUR 630 Mediating Diversity through Audio Story-telling** (3 credits) *Prerequisite:* JOUR 601 previously or concurrently or permission of the program director. The course is an experiential workshop that blends journalism theory and practice. Students function both as reporters, in order to learn the skills necessary to produce robust audio stories, and digital researchers tasked with examining diversity and media representation issues arising in class to explore journalism's mediating function in society.
JOUR 640 Textual Approaches to Journalism (3 credits) *Prerequisite:* JOUR 601 previously or concurrently. This course concentrates on journalism's use of all forms of language, from written text to sounds and images. Drawing from the literature on linguistics, semiotics, textual and discourse analysis, students consider ways in which journalists, through their use of language to describe and depict people, events, institutions and ideas, become implicated in the news they report.	**JOUR 640 Textual Approaches to Journalism** (3 credits) *Prerequisite:* JOUR 601 previously or concurrently. This course concentrates on journalism's use of all forms of language, from written text to sounds and images. Drawing from the literature on linguistics, semiotics, textual and discourse analysis, students consider ways in which journalists, through their use of language to describe and depict people, events, institutions and ideas, become implicated in the news they report.
	JOUR 642 Special Topics in Journalism Studies (3 credits) This seminar permits the in-depth examination of particular special topics in digital innovation in journalism studies. Topics vary from year to year.
JOUR 645 Directed Study (3 credits) *Prerequisite:* Permission of the MA Program Director. Students may enrol in a directed study under faculty supervision in order to undertake a specialized study of theoretical or research-related topics.	**JOUR 645 Directed Study** (3 credits) *Prerequisite:* Permission of the MA Program Director. Students may enrol in a directed study under faculty supervision in order to undertake a specialized study of theoretical or research-related topics.
JOUR 650 Journalism Readings and Proposal (6 credits) *Prerequisite:* JOUR 601. In consultation with the faculty advisor, the student reviews relevant literature pertinent to the research topic and writes a thesis proposal demonstrating knowledge based upon the review of the scholarly literature.	**JOUR 650 Journalism Readings and Proposal** (6 credits) *Prerequisite:* JOUR 601. In consultation with the faculty advisor, the student reviews relevant literature pertinent to the research topic and writes a thesis proposal demonstrating knowledge based upon the review of the scholarly literature.
JOUR 691 Thesis (24 credits) *Prerequisite:* JOUR 650. The thesis is researched and written under the direction of a supervisor. Upon completion, it is submitted to the student's Thesis Committee. The thesis is defended in an oral examination before the Thesis Committee.	**JOUR 691 Thesis** (24 credits) *Prerequisite:* JOUR 650. The thesis is researched and written under the direction of a supervisor. Upon completion, it is submitted to the student's Thesis Committee. The thesis is defended in an oral examination before the Thesis Committee.
JOUR 693 Research-Creation Thesis (24 credits) *Prerequisite:* JOUR 650. The Research-Creation Thesis is specifically designed for students with media production experience who wish to complete an original media production using a suitable media platform, complemented by a text of approximately 10,000 words comprising a literature	**JOUR 693 Research-Creation Thesis** (24 credits) *Prerequisite:* JOUR 650. The Research-Creation Thesis is specifically designed for students with media production experience who wish to complete an original media production using a suitable media platform, complemented by a text of approximately 10,000 words comprising a literature

and media review, a theoretical and methodological contextualization, and a critical reflection on the project and its outcomes. **JOUR 694 Essay** (18 credits) *Prerequisites:* JOUR 601, 604, 605. Students produce an essay on a research topic developed in consultation with a faculty member that explores a specific issue relevant to journalism studies. The final essay must be evaluated by a second faculty member. The essay's length is approximately 40 pages, which does not include a bibliography. The course is normally taken in term five of the students' degree.	and media review, a theoretical and methodological contextualization, and a critical reflection on the project and its outcomes. **JOUR 694 Essay** (18 credits) *Prerequisites:* JOUR 601, 604, 605. Students produce an essay on a research topic developed in consultation with a faculty member that explores a specific issue relevant to journalism studies. The final essay must be evaluated by a second faculty member. The essay's length is approximately 40 pages, which does not include a bibliography. The course is normally taken in term five of the students' degree.

Rationale:
These additional courses provide students with more elective options and flexibility to take courses offered by other departments than are currently offered in the M.A. program structure and will facilitate a more manageable timeline in which they may finish their program coursework.

Reference to taking six credits outside of the department is removed under Option C as a note is added under the 'Courses' section.

Resource Implications:
None. JOUR 523 and 642 will be offered as part of our existing course allotment.

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **JOUR-7** VERSION: 3

COURSE CHANGE: JOUR 642 New Course Number:

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: Fall 2018

Faculty/School: Arts and Science
Department: Journalism
Program: Digital Innovation in Journalism Studies
Degree: MA
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	JOUR 642 Special Topics in Journalism Studies (3 credits) This seminar permits the in-depth examination of particular special topics in digital innovation in journalism studies. Topics vary from year to year.

Rationale:
The additon of this course to M.A. curriculum provides M.A. students with another elective option. In additon, the new course provides the department with flexibility to mount a special topics course that may attract graduate students from other disciplines.

Resource Implications:
None. JOUR 642 will be offered as part of our existing course allotment.

Other Programs within which course is listed:

None.

Concordia University
School of Graduate Studies

MEMO TO: Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: January 5, 2018

SUBJECT: **GRADUATE CURRICULUM CHANGES (RELI-53)**
(CALENDAR – 2018/2019)
DEPARTMENT OF RELIGIONS AND CULTURES
FACULTY OF ARTS AND SCIENCE

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Arts and Science Faculty Council.

The Department of Religions and Cultures is proposing to make changes to the calendar so as to reflect the recent change to the department's name.

The GCC approved the proposed curriculum changes as presented. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: P. Joyce, Associate Dean, Academic Programs, Faculty of Arts and Science
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Bradley Nelson
Associate Dean, School of Graduate Studies
Chair, Graduate Curriculum Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: November 17, 2017

SUBJECT: Graduate Calendar Curriculum Changes
Department of Religions and Cultures
RELI-53
Doctor of/Doctorate in Philosophy (Religion) – RELI 820-839 Topics in Religions and Cultures

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The Arts and Science Faculty Council has reviewed and approved the following proposal and requests that it be considered at the next meeting of the Graduate Curriculum Committee.

Further to the department name change (9 December 2016 Senate resolution), the Department of Religions and Cultures is ensuring that references to the department make use of the new name. In the same context, they are updating the title of topics group, RELI 820-839, to Topics in Religions and Cultures to reflect the change of name.

Thank you for your consideration of this proposal for which there are no additional resource implications.

Reference documents:
FCC 2017.1/RELI-53
ASFC 2017-6M-D_RELI-53

Department of Religions and Cultures

RELI-53

Memo from Chair

Editorial Changes to Requirements

Doctor of/Doctorate in Philosophy (Religion) - RELI 820-839 Topics in Religions and Cultures

UNIVERSITÉ Concordia UNIVERSITY

FACULTY OF ARTS AND SCIENCE

Department of Religions and Cultures

Internal Memorandum

TO: Dr. Paul Joyce, Associate Dean
Academic Programs, Faculty of Arts and Science

FROM: Dr. Carly Daniel-Hughes, Chair
Department of Religions and Cultures

DATE: August 31, 2017

RE: **PhD Topics Group Renamed**

In light of our recent department name change, from the Department of Religion to the Department of Religions and Cultures, we request that our PhD groups of courses appear with an appropriate title. We would like the PhD topics title to be changed from "RELI 820-839 Topics in Comparative Religion and Ethics" to "RELI 820-839 Topics in Religions and Cultures".

The Graduate Curriculum Committee of the Department of Religions and Cultures approved this change on May 5, 2017.

2060 Mackay St., FA-101, Montreal, Quebec, Canada H3G 1R6

Tel. 514-848-2424 ext. 2065 concordia.ca/artsci/religions-cultures

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **RELI-53** VERSION: 3

PROGRAM CHANGE: Doctor of/Doctorate in Philosophy (Religion)

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: Fall 2018

Faculty/School: Arts and Science
Department: Department of Religions and Cultures
Program: Doctor of/Doctorate in Philosophy (Religion)
Degree: PhD
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[X] Editorial [X] Requirements [ ] Regulations [ ] Program Deletion [ ] New Program

Present Text (from 2017/2018) calendar	**Proposed Text**
# Doctor of/Doctorate in Philosophy (Religion) This degree is offered conjointly with the Département des sciences religieuses of the Université du Québec à Montréal and the Faculté de théologie et de sciences religieuses of the Université Laval. There are five areas of concentration: theories of religion, history of religions, contemporary religious phenomena, Judaic studies, and comparative religion and ethics. A student chooses to register in one of the three universities on the basis of the match between faculty expertise and the student's specialization, and is subject to that university's regulations. Each student is graduated by the university of their registration. The joint degree provides a context for collaboration between the three departments, with some exchange of faculty for teaching and direction. There are two required doctoral seminars one of which is common to students at all three universities in alternate years. The doctoral program in Religion at Concordia places strong emphasis on a comparative approach. The comparative study of religion incorporates a number of different but related inquiries, including: examination of the inter-relations between religious beliefs and practices; analysis of religions as social and cultural phenomena and of cultures and societies insofar as they have been influenced by religious traditions; study of inter-relations between religions and human values; investigation of religious ethics; as well as analysis of social issues from the perspective of religious values. These studies are comparative insofar as particular expressions of religions and ethics are viewed as unique but historically situated realities which often can best be understood by making formal or informal comparisons with other comparable realities. Although the requirements are fundamentally the same in all three universities, the remainder of this section applies only to students registered at Concordia.	# Doctor of/Doctorate in Philosophy (Religion) This degree is offered conjointly with the Département des sciences religieuses of the Université du Québec à Montréal and the Faculté de théologie et de sciences religieuses of the Université Laval. There are five areas of concentration: theories of religion, history of religions, contemporary religious phenomena, Judaic studies, and comparative religion and ethics. A student chooses to register in one of the three universities on the basis of the match between faculty expertise and the student's specialization, and is subject to that university's regulations. Each student is graduated by the university of their registration. The joint degree provides a context for collaboration between the three departments, with some exchange of faculty for teaching and direction. There are two required doctoral seminars one of which is common to students at all three universities in alternate years. The doctoral program in Religion at Concordia places strong emphasis on a comparative approach. The comparative study of religion incorporates a number of different but related inquiries, including: examination of the inter-relations between religious beliefs and practices; analysis of religions as social and cultural phenomena and of cultures and societies insofar as they have been influenced by religious traditions; study of inter-relations between religions and human values; investigation of religious ethics; as well as analysis of social issues from the perspective of religious values. These studies are comparative insofar as particular expressions of religions and ethics are viewed as unique but historically situated realities which often can best be understood by making formal or informal comparisons with other comparable realities. Although the requirements are fundamentally the same in all three universities, the remainder of this section applies only to students registered at Concordia.

Admission Requirements. A Master of Arts in Religion, or equivalent, with high standing from a recognized university.

The Department will consider the application of students to the PhD program for entry without completion of the master's degree if the following requirements are met:

- the student has completed 18 credits of graduate level course work in Religion with high standing;
- the student is recommended by full-time members of the faculty of the Department of Religion;
- the student has acquired a breadth of knowledge in the study of Religion through course work or scholarly or professional experience;
- the student has demonstrated her or his ability to do independent graduate-level research in religious studies, and has demonstrated the ability to produce an original analysis of her/his research (in the form of research papers, conference papers, or publications);
- the student has a well-formed and focused research plan that will serve as a basis for her/his doctoral research.

Transfer Credits. See Transfer Credits in Graduate Admissions section.

Proficiency in English. Any student applying from outside Canada whose first language is not English must demonstrate proficiency in the English language by writing the Test of English as a Foreign Language administered by the Educational Testing Service. Information and applications to write the test may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey, 08540, U.S.A.

Requirements for the Degree

1. **Credits.** A fully-qualified candidate is required to complete a minimum of 90 credits.

2. **Residence.** The minimum period of residence is two years (6 terms) of full-time graduate study beyond the master's degree, or the equivalent in part time study, or three years (9 terms) of full-time graduate study beyond the bachelor's degree.

3. **Doctoral Seminars.** All candidates must register for RELI 890 (6 credits) in their first or second or equivalent year of study. This seminar will deal with general and methodological issues in the study of religion. It will be held in common with UQAM and Université Laval; discussion and readings will be both in English and in French. In the first or second or equivalent year of the program, the student will register as well for one of the following seminars according to their specialization: RELI 891, Comparative Religion and Ethics (6 credits), or RELI 892, Judaic Studies (6 credits).

4. **Courses.** A student is required to register for a minimum of 18 credits of directed reading. These courses are offered according to the resources of the department and the needs of the students. They are grouped into RELI 800-818 (Topics in Judaic Studies) and RELI 820-839 (Topics in ~~Comparative~~ Religion and ~~Ethics~~). Some of the courses at the Master of Arts level are open to PhD candidates, with

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- the student has acquired a breadth of knowledge in the study of Religion through course work or scholarly or professional experience;
- the student has demonstrated her or his ability to do independent graduate-level research in religious studies, and has demonstrated the ability to produce an original analysis of her/his research (in the form of research papers, conference papers, or publications);
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the requirement of additional work and higher standards of performance.

5. **Comprehensive Examination.** Graduate students in Religion at the doctoral level are expected to pursue a program of independent study and research in their chosen field. After course work is completed, all candidates must take RELI 860: Doctoral Comprehensive Examination (15 credits). The comprehensive examination will consist of three written exams followed by an oral examination which reviews these exams. In most cases, two of these written exams focus on topics from two distinct religious traditions; the third written exam will be on a topic related to a student's proposed thesis. One of the three exams should include a focus on theory and methodology. Credits are not distributed among these four examinations. For purposes of registration, this work will be designated as RELI 860 and is graded as pass/fail.

6. **Thesis.** Each candidate will prepare a doctoral thesis which is to be an original contribution to scholarship. Although the topic should be provisionally chosen and serve as a coordinating factor throughout the student's doctoral program, a written proposal must be formally submitted and approved by the Graduate Studies Committee after the successful completion of the comprehensive examination. For purposes of registration, the thesis will be designated as RELI 870: Doctoral Thesis (45 credits).

7. **Language Requirement.** Students must achieve an acceptable command of the classical and/or modern languages appropriate to their area of specialization. Specific requirements in terms of numbers of years of study and examinations or other demonstrations of competence are established in consultation with the Graduate Program Director and the thesis supervisor. Students are also expected to be proficient in the language or languages of the primary sources relevant to their thesis research. All Canadian students are required to demonstrate a working knowledge of both English and French.

Academic Regulations

1. **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

2. **C Rule.** A graduate student who receives one grade of "C" will be evaluated by the Departmental Graduate Studies Committee with respect to that student's continuance in the program. Two "C"s will result in automatic withdrawal from the program. See Academic Standing in Academic Regulations section.

3. **IP Rule.** Students who accumulate more than one IP (In Progress) notation or one IP that has turned into an F shall not normally be permitted to register for courses until the outstanding work is completed.

4. **F Rule.** Students who receive a failing grade in the course of their PhD studies will be withdrawn from the program. See Academic Standing in Academic

requirement of additional work and higher standards of performance.

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Regulations section. 5. **Time Limit.** The limit to complete the doctoral program is six years (18 terms) of full-time study or eight years (24 terms) of part-time study from the time of original registration in the program. 6. **Graduation Requirement.** In order to graduate, students must have satisfied all degree requirements and have a cumulative GPA of at least 3.00. **Courses** Since the topics of elective courses are subject to modification according to student enrolment and demands, no course list is provided in this calendar.	Regulations section. 5. **Time Limit.** The limit to complete the doctoral program is six years (18 terms) of full-time study or eight years (24 terms) of part-time study from the time of original registration in the program. 6. **Graduation Requirement.** In order to graduate, students must have satisfied all degree requirements and have a cumulative GPA of at least 3.00. **Courses** Since the topics of elective courses are subject to modification according to student enrolment and demands, no course list is provided in this calendar.

Rationale:
We request that the course group "RELI 820-839 Topics in Comparative Religion and Ethics" be changed to reflect the revised department name. "RELI 820-839 Topics in Religions and Cultures" reflects the course content as it has been taught for a number of years. The old title for this section of topics courses (Comparative Religion and Ethics) is no longer applicable, as "ethics" is not a key element in the courses' material (whereas "ethos" -- i.e. culture -- is) and the late 19th-century idea of "comparative religion" as a foundational approach for religious studies is one that we seek to problematize in this course set.

Resource Implications:
None.

Concordia University
School of Graduate Studies

MEMO TO: Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: February 2, 2018

SUBJECT: **GRADUATE CURRICULUM CHANGES (GCBA-6)**
(CALENDAR – 2018/2019)
GRADUATE CERTIFICATE IN BUSINESS ADMINISTRATION
JOHN MOLSON SCHOOL OF BUSINESS

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Council of the John Molson School of Business (JMSB).

JMSB presented one change to a course requirement and several editorial changes to to the Graduate Certificate in Business Administration.

The GCC approved this document with minor modifications. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: S. Betton, Associate Dean, Professional Graduate Programs
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

UNIVERSITÉ Concordia UNIVERSITY

JOHN MOLSON SCHOOL OF BUSINESS

To: Bradley Nelson, Associate Dean, Academic Programs and Development
Chair, Graduate Curriculum Committee

Cc: Frédérica Martin, Academic Programs Analyst
Olivia Ward, University Curriculum Advisor

From: Anne-Marie Croteau, Dean, John Molson School of Business

Date: December 19, 2017

Subject: Proposed changes to the Graduate Certificate in Business Administration

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Please find attached the proposal for changes to the Graduate Certificate in Business Administration.

The document was unanimously approved at the JMSB Faculty Council meeting of December 8th, 2017.

I respectfully request that the proposed changes be presented to the next Graduate Curriculum Committee meeting for consideration.

Thank you.

Attachment

Internal Memorandum

To: Anne-Marie Croteau, Dean, John Molson School of Business

Cc: Barbara Henchey, Director, Office of the Dean, JMSB

From: Sandra Betton, Associate Dean, Professional Graduate Programs
Chair of the Faculty Academic Programs Committee, JMSB

Date: November 17, 2017

Subject: Proposed changes to the Graduate Certificate in Business Administration

Please find attached the proposal for changes in the Graduate Certificate in Business Administration.

The document was unanimously approved at the JMSB Faculty Academic Programs Committee meeting of November 16th, 2017.

Attached you will find the proposal and summary of changes.

I respectfully request that the proposed changes be submitted to the next JMSB Faculty Council meeting for consideration.

Internal Memorandum

To:	Sandra Betton, Associate Dean, Professional Graduate Programs
From:	Anne Beaudry, Director Graduate Diploma and Graduate Certificate in Business Administration
Date:	October 24, 2017
Subject:	Proposed changes to the Graduate Certificate in Business Administration

The Graduate Certificate in Business Administration (GCBA) comprises the first five required core courses from the Graduate Diploma in Business Administration (GDBA). The first of these courses is GDBA 530 “Business Data Analytics”, a pre-requirement to other courses in the GDBA, but not a requirement for any other course in the GCBA. In addition, students in the GCBA have been asking for the opportunity to take an elective which would fit their needs and interests. On October 12, 2017, the GD/GCBA committee unanimously voted to replace GDBA 530 by an elective in the GCBA.

I respectfully request that the proposed changes be submitted to the next Faculty Academic Programs Committee meeting.

Graduate Certificate in Business Administration
Curriculum Change Proposal

Deletion of GDBA 530 (Business Data Analytics) as a core course and replacement of it by an elective.

The proposed revised Graduate Certificate in Business Administration comprises four core courses and one elective as follows:

GDBA 531 Professional Business Skills

GDBA 532 Accounting

GDBA 533 Managing People in Organizations

GDBA 534 Marketing Management

One elective to be chosen from GDBA 530 (Business Data Analytics) or any other GDBA elective.

Justification:

a) GDBA 530 is not a pre- or co-requirement to any other course offered in the GCBA;

b) GDBA 530 is not related to any of the four other courses in the Certificate whereas the relationship between the four other courses is more obvious as they all relate to various aspects of Management;

c) Students in the GCBA have been asking to have the opportunity to choose an elective that would meet their needs and interests. This issue is raised on a regular basis by students and was mentioned in the last survey of students satisfaction with the program which was conducted as part of the Program Appraisal;

d) Students who are interested in Business Data Analytics can take GDBA 530 as their elective.

The proposed changes are shown in the table below:

Current GCBA curriculum	Proposed GCBA curriculum
GDBA 530 Business Data Analytics	GDBA 531 Professional Business Skills
GDBA 531 Professional Business Skills	GDBA 532 Accounting
GDBA 532 Accounting	GDBA 533 Managing People in Organizations
GDBA 533 Managing People in Organizations	GDBA 534 Marketing Management
GDBA 534 Marketing Management	One elective

PROGRAM CHANGE:

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Certificate in Business Administration
Degree: Graduate Certificate
Calendar Section/Graduate Page Number: Winter 2018
Type of Change:
[ ] Editorial [X] Requirements [ ] Regulations[ ] Program deletion [ ]
New Program

Present Text (from 2017/2018 Calendar)	Proposed Text
Requirements for the Certificate 1. **Credits.** The program consists of five courses (total 15 credits). ~~2.~~ **Courses.** All students are required to complete ~~five~~ courses (~~15~~ credits). ~~GDBA 530 and GDBA 531 must be taken as the first two courses in the program. Students who have successfully completed a statistics course in a previous program with a minimum grade of "B" may be exempt from taking GDBA 530 with the permission of the Program Director. In this case, the course must be substituted with an elective.~~	**Requirements for the Certificate** 1. **Credits.** The program consists of five courses (total 15 credits). 2. **Courses.** All students are required to complete four core courses (12 credits) and one elective (3 credits).
Rationale: GDBA 530 and 531 are already a co- or pre-requisite where necessary and therefore, the requirement that it be completed in the first term is unnecessary.	
Resource Implications: None.	

PROGRAM CHANGE:
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Certificate in Business Administration
Degree: Graduate Certificate
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[X] Editorial [X] Requirements [ ] Regulations [ ] Program deletion [ ] New Program

Present Text (from 2017/2018 Calendar)	**Proposed Text**
Required Courses (~~15~~ credits) ~~**GDBA 530 Business Data Analytics**~~ **GDBA 531 Professional Business Skills** **GDBA 532 Accounting** **GDBA 533 Managing People in Organizations** **GDBA 534 Marketing Management** ~~Students who are exempted from GDBA 530 may take one of the following GDBA courses as a substitute, upon approval from the Program Director:~~ ~~**GDBA 535 Finance**~~ ~~**GDBA 536 Operations Management**~~ ~~**GDBA 537 Managerial Economics**~~ ~~**GDBA 538 Strategic Management**~~ ~~**GDBA 595 Special Topics**~~ ~~**Course Descriptions (Core Courses)**~~ ~~**Course Descriptions (Electives)**~~ ~~Students who are exempted from GDBA 530 may take one of the following GDBA courses as a substitute, upon approval from the Program Director:~~ ~~**GDBA 595 Special Topics** (3 credits)~~	**Required Courses** (12 credits) **GDBA 531 Professional Business Skills** **GDBA 532 Accounting** **GDBA 533 Managing People in Organizations** **GDBA 534 Marketing Management** **Elective** (3 credits) to be chosen from: **GDBA 530 Business Data Analytics** Or Any elective in the GDBA program.

Rationale: Curriculum change to remove GDBA 530 from the core requirement courses, and to permit GDBA 530 to be taken as an elective.

Resource Implications: None

DOSSIER TITLE: GCBA-6
DESCRIPTION OF CHANGE: Removal of GDBA 530 from core course descriptions in the calendar
PROGRAM CHANGE - CALENDAR UPDATE FORM – *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September 2018

Faculty: John Molson School of Business **Department:** (if applicable)

Program: (if applicable) Graduate Certificate in Business Administration **Degree:** (if applicable) Graduate Certificate **Section Title:** (if applicable)Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[X] Editorial [X] Requirements [ ] Regulations
[ ] New Program [ ] Program Deletion

Present Text (Text from 2017– 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
Course Descriptions (Core Courses) ~~**GDBA 530 Business Data Analytics** (3 credits)~~ ~~This course provides students with the skills and knowledge needed to analyze business data. Using spreadsheet software throughout the course, students learn to summarize and describe data with charts, graphs and numbers, to visualize and measure relationships in data and acquire the ability to make inferences and predictions. Students acquire a working knowledge of the statistical tools and techniques required for better decision making. The course combines lecturing with actual business applications and class discussions aimed at encouraging critical thinking, analytical skills and ethical manipulation and reporting of data.~~ ~~**Note 1:** Students who have successfully completed a statistics course in a previous program with a minimum grade of "B" may be exempt from taking GDBA 530 with the permission of the Program Director. In this case, the course must be substituted with an elective.~~ ~~**Note 2:** Students who have received credit for GDBA 502 may not take this course for credit~~ **GDBA 531 Professional Business Skills** (3 credits) This course provides students with the necessary skills that help with successful interaction with others in business settings. Topics include designing and delivering effective written and oral messages from concept to delivery, working in groups, and negotiating and resolving conflict by using	**Course Descriptions (Core Courses)** **GDBA 531 Professional Business Skills** (3 credits) This course provides students with the necessary skills that help with successful interaction with others in business settings. Topics include designing and delivering effective written and oral messages from concept to delivery, working in groups, and negotiating and resolving conflict by using ethical communication tactics. Pedagogical methods include group-based work, in-class workshops, case studies, presentations and report writing. …

ethical communication tactics. Pedagogical methods include group-based work, in-class workshops, case studies, presentations and report writing. …	

Rationale: Curriculum change to remove GDBA 530 from the core requirement courses, and thus from the core course description section in the calendar. The course description section will include the course descriptions for the core courses: GDBA 531, GDBA 532, GDBA 533 and GDBA 534.
Resource Implications: None.

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

GCBA-6

DOSSIER TITLE: GCBA - 6

DESCRIPTION OF CHANGE: Removal of Course descriptions (Electives)

PROGRAM CHANGE - CALENDAR UPDATE FORM – *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September 2018

Faculty: John Molson School of Business **Department:** (if applicable)

Program: (if applicable) Graduate Certificate in Business Administration **Degree:** (if applicable) Graduate Certificate **Section Title:** (if applicable)

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[X] Editorial [ ] Requirements [ ] Regulations

[ ] New Program [ ] Program Deletion

Present Text (Text from 2017 – 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
~~**Course Descriptions (Electives)**~~ ~~Students who are exempted from GDBA 530 may take one of the following GDBA courses as a substitute, upon approval from the Program Director:~~ ~~**GDBA 535 Finance** (3 credits)~~ ~~*Prerequisite:* GDBA 530 previously or concurrently, and 532.~~ ~~This course provides students with a general understanding of the fundamental concepts of finance as they apply to financial management and investment analysis. Building on the objective of firm value maximization, students learn to describe and value risky financial securities and long-term capital projects as well as to manage the firm's short-term financial planning and decisions. Pedagogical methods include exercises, cases, simulations and class discussions.~~ ~~**Note:** Students who have received credit for GDBA 505 may not take this course for credit.~~ ~~**GDBA 536 Operations Management** (3 credits)~~ ~~*Prerequisites:* GDBA 530 previously or concurrently.~~ ~~This course provides students with the quantitative and qualitative techniques to achieve efficient and effective utilization of scarce resources in business. Topics include planning, management and control of labour, machinery, material, money, information and time resources in manufacturing and service sectors. Recent developments in these areas are introduced within the context of manufacturing and service strategies. The course uses class discussion, case analysis and simulation to illustrate key concepts and practices in operations management. The interactions with other functional~~	

areas, such as information systems, marketing, accounting and finance are discussed through case studies.
Note: Students who have received credit for GDBA 506 may not take this course for credit.

GDBA 537 Managerial Economics (3 credits)
Prerequisites: GDBA 530 previously or concurrently.
This course introduces the principles of economics. The emphasis is on the role of the decision maker who has to identify and implement profitable decisions. The course applies economic reasoning to business problems including bargaining, adverse selection, moral hazard, and incentive alignment. Pedagogical methods include exercises, cases and class discussions.
Note: Students who have received credit for GDBA 507 may not take this course for credit.

GDBA 538 Strategic Management (3 credits)
Prerequisites: 12 credits including GDBA 530 and 531.
This capstone course provides students with an understanding of how firms gain and sustain competitive advantage in various business sectors. Specific topics include industry environment analysis, internal analysis of firm resources and capabilities, the analysis of business and corporate level strategies, and various strategic alternatives such as mergers and acquisitions, strategic alliances, and internationalization strategies. The course uses case analysis as the main approach to build abilities in strategic analysis and decision making.

GDBA 595 Special Topics (3 credits)

Rationale: GCBA students will not be able to take the above outlined courses, because they will not have completed GDBA 530. Elective course descriptions will be viewable under the GDBA program.

Resource Implications: None.

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

Concordia University
School of Graduate Studies

MEMO TO: Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: February 2, 2018

SUBJECT: **GRADUATE CURRICULUM CHANGES (GDBA-6)**
(CALENDAR – 2018/2019)
GRADUATE DIPLOMA IN BUSINESS ADMINISTRATION
JOHN MOLSON SCHOOL OF BUSINESS

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Council of the John Molson School of Business (JMSB).

JMSB made changes to course numbers, course names, and descriptions.The GCC approved this document with minor modifications. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: S. Betton, Associate Dean, Professional Graduate Programs
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

UNIVERSITÉ Concordia UNIVERSITY

JOHN MOLSON SCHOOL OF BUSINESS

To: Bradley Nelson, Associate Dean, Academic Programs and Development
Chair, Graduate Curriculum Committee

Cc: Frédérica Martin, Academic Programs Analyst
Olivia Ward, University Curriculum Advisor

From: Anne-Marie Croteau, Dean, John Molson School of Business

Date: December 19, 2017

Subject: Proposed changes to the Graduate Diploma in Business Administration

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Please find attached the proposal for changes to the Graduate Diploma in Business Administration.

The document was unanimously approved at the JMSB Faculty Council meeting of December 8th, 2017.

I respectfully request that the proposed changes be presented to the next Graduate Curriculum Committee meeting for consideration.

Thank you.

Attachment

Internal Memorandum

To: Anne-Marie Croteau, Dean, John Molson School of Business

Cc: Barbara Henchey, Director, Office of the Dean, JMSB

From: Sandra Betton, Associate Dean, Professional Graduate Programs
Chair of the Faculty Academic Programs Committee, JMSB

Date: November 17, 2017

Subject: Proposed changes to the Graduate Diploma in Business Administration

Please find attached the proposal for changes in the Graduate Diploma in Business Administration.

The document was unanimously approved at the JMSB Faculty Academic Programs Committee meeting of September 14th, 2017.

I respectfully request that the proposed changes be submitted to the next JMSB Faculty Council meeting for consideration.

Attachment

Internal Memorandum

To: Sandra Betton, Associate Dean, Professional Graduate Programs

From: Anne Beaudry, Director
Graduate Diploma and Graduate Certificate in Business Administration

Date: August 18, 2017

Subject: Proposed changes to the Graduate Diploma in Business Administration

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Following the change to the new SIS, the numbering of our GDBA courses has become confusing. Since it is no longer possible to identify topics with a specific letter, the same course number is repeatedly used for all electives. In order to clearly identify elective courses, new course numbers and names are proposed that will allow students to differentiate between them. In addition, new course numbers, names, and descriptions are proposed for two courses that have been offered as electives for many years.

The proposed changes were approved by the GD/GCBA Committee on March 23, 2017.

The attached document provides a summary of the proposed changes.

I respectfully request that the proposed changes be submitted to the next Faculty Academic Programs Committee meeting.

Graduate Diploma in Business Administration

Curriculum Change Proposal

1. Specific course number, name, and description for two new courses, namely "Entrepreneurship" and "Business Law" that have been offered yearly for more than five years as "Special Topics – GDBA595". "Entrepreneurship" typically has an average of 22 students, while on average, 18 students enroll in "Business Law".
2. The creation of new course numbers and names for "Special Topics" courses offered by the different departments in order to eliminate repetition of the same course title and number of all electives offered in the GDBA program and eliminate related confusion.

Summary of proposed changes:

Proposed course number and name		Type of Change
GDBA 540*	Entrepreneurship	New Course - Currently offered as "slot" course under GDBA 595
GDBA 541	Business Law	New Course - Currently offered as "slot" course under GDBA 595
GDBA 590	Special Topics in Accountancy	New Course number and name to reduce confusion among electives
GDBA 591	Special Topics in Finance	New Course number and name to reduce confusion among electives
GDBA 592	Special Topics in Management	New Course number and name to reduce confusion among electives
GDBA 593	Special Topics in Marketing	New Course number and name to reduce confusion among electives
GDBA 594	Special Topics in Supply Chain and Business Technology Management	New Course number and name to reduce confusion among electives

**cross-listed with GCE 514*

New course number, name, and description for two courses currently offered as

"Special Topics – GDBA 595".

Entrepreneurship*

Proposed course number: GDBA 540

Students conduct a market study and develop a complete business plan, including the operational, financial and marketing plan. Topics may include: transforming an idea into a business, analyzing the market and competition, and planning operations and finances for the next three to five years. Pedagogical methods include lectures, case studies, and the development of a business plan.

**Course description of GCE 514*

Business Law

Proposed course number: GDBA 541

Students learn the basic principles of the Quebec legal system, the various methods available to start a new business and how to select the most appropriate form of business. Students also learn basic legal notions relating to contracts, civil liability and employment law allowing them to better understand these legal principles in the context of operating a business.

PROGRAM CHANGE:
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:
Winter 2018
Type of Change:
[X] Editorial [X] Requirements [ ] Regulations [ ] Program deletion [ ] New Program

Present Text (from 2017/2018 Calendar)	Proposed Text
Requirements for the Diploma 1. **Credits.** A fully qualified candidate is required to complete a minimum of 30 credits. 2. **Courses.** All students are required to complete nine core courses (27 credits) and one elective (3 credits). ~~GDBA 530 and GDBA 531 must be taken as the first two courses in the program.~~ Students who have successfully completed a statistics course in a previous program with a minimum grade of "B" may be exempt from taking GDBA 530 with the permission of the Program Director. In this case, the course must be substituted with an elective. See class schedule for elective offerings. … **Required Core Courses** (27 credits) **GDBA 530 Business Data Analytics** **GDBA 531 Professional Business Skills** **GDBA 532 Accounting** **GDBA 533 Managing People in Organizations** **GDBA 534 Marketing Management** **GDBA 535 Finance** **GDBA 536 Operations Management** **GDBA 537 Managerial Economics** **GDBA 538 Strategic Management** **Elective** (3 credits) **GDBA 595 Special Topics**	**Requirements for the Diploma** 1. **Credits.** A fully qualified candidate is required to complete a minimum of 30 credits. 2. **Courses.** All students are required to complete nine core courses (27 credits) and one elective (3 credits). Students who have successfully completed a statistics course in a previous program with a minimum grade of "B" may be exempt from taking GDBA 530 with the permission of the Program Director. In this case, the course must be substituted with an elective. See class schedule for elective offerings. … **Required Core Courses** (27 credits) **GDBA 530 Business Data Analytics** **GDBA 531 Professional Business Skills** **GDBA 532 Accounting** **GDBA 533 Managing People in Organizations** **GDBA 534 Marketing Management** **GDBA 535 Finance** **GDBA 536 Operations Management** **GDBA 537 Managerial Economics** **GDBA 538 Strategic Management** **Elective** (3 credits) **GDBA 540 Entrepreneurship** **GDBA 541 Business Law** **GDBA 590 Special Topics in Accountancy** **GDBA 591 Special Topics in Finance** **GDBA 592 Special Topics in Management**

	GDBA 593 Special Topics in Marketing **GDBA 594 Special Topics in Supply Chain and Business Technology Management** **GDBA 595 Special Topics** **Note:** Special topics for this course are stated in the Class Schedule.
Rationale: The new SIS no longer permits topic differentiation by letter suffixes. This becomes confusing for all stakeholders to see the same course number listed in the student record. We propose new differentiating numbers for special topics courses. GDBA 595 remains for any multidisciplinary course. This change also adds two new courses (GDBA 540, 541) to the electives. GDBA 530 and 531 are already listed as prerequisite or concurrent for specific courses, and therefore the sentence regarding the requirement to take those courses first is superfluous, and has been removed.	
Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.	

COURSE CHANGE: **New Course Number: GDBA 590**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number
[ ] Course Description
[ ] Course Deletion
[ ] Course Title
[ ] Editorial
[ ] Other - Specify: Note
[ ] Credit Value
[X] New Course
[ ] Prerequisite

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 590 Special Topics in Accountancy (3 credits) Note: Students who have received credit for the same topic under GDBA 595 may not take this course for credit.

Rationale: The new SIS no longer permits topic differentiation by letter suffixes. We propose new differentiating numbers for special topics courses.

Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.

Other Programs within which course is listed:

COURSE CHANGE: **New Course Number: GDBA 591**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number
[ ] Course Description
[ ] Course Deletion
[ ] Course Title
[ ] Editorial
[ ] Other - Specify: Note
[ ] Credit Value
[X] New Course
[ ] Prerequisite

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 591 Special Topics in Finance (3 credits) Note: Students who have received credit for the same topic under GDBA 595 may not take this course for credit.
Rationale: The new SIS no longer permits topic differentiation by letter suffixes. We propose new differentiating numbers for special topics courses.	
Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.	
Other Programs within which course is listed:	

COURSE CHANGE: **New Course Number: GDBA 592**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify: Note

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 592 Special Topics in Management (3 credits) Note: Students who have received credit for the same topic under GDBA 595 may not take this course for credit.
Rationale: The new SIS no longer permits topic differentiation by letter suffixes. We propose new differentiating numbers for special topics courses.	
Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.	
Other Programs within which course is listed:	

COURSE CHANGE: **New Course Number: GDBA 593**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify: Note

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 593 Special Topics in Marketing (3 credits) Note: Students who have received credit for the same topic under GDBA 595 may not take this course for credit.
Rationale: The new SIS no longer permits topic differentiation by letter suffixes. We propose new differentiating numbers for special topics courses.	
Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.	
Other Programs within which course is listed:	

COURSE CHANGE: **New Course Number: GDBA 594**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number
[ ] Course Description
[ ] Course Deletion
[ ] Course Title
[ ] Editorial
[ ] Other - Specify: Note
[ ] Credit Value
[X] New Course
[ ] Prerequisite

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 594 Special Topics in Supply Chain and Business Technology Management (3 credits) Note: Students who have received credit for the same topic under GDBA 595 may not take this course for credit.

Rationale: The new SIS no longer permits topic differentiation by letter suffixes. We propose new differentiating numbers for special topics courses.

Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.

Other Programs within which course is listed:

COURSE CHANGE: **New Course Number: GDBA 540**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number
[ ] Course Description
[ ] Course Deletion
[ ] Course Title
[ ] Editorial
[ ] Other - Specify: Note
[ ] Credit Value
[X] New Course
[ ] Prerequisite

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 540 Entrepreneurship (3 credits) Students conduct a market study and develop a complete business plan, including the operational, financial and marketing plan. Topics may include: transforming an idea into a business, analyzing the market and competition, and planning operations and finances for the next three to five years. Pedagogical methods include lectures, case studies, and the development of a business plan. **Note:** Students who have received credit for this topic under GDBA 595 may not take this course for credit.

Rationale: This course has been offered as a Special Topics course under GDBA 595 on a yearly basis since 2012. In the last four years average enrollment was 22.5 students per section. This course adds to the program by taking a completely different perspective. While all other courses cover the various business functions and their interrelations, in the Entrepreneurship course, students learn how to start a business.

Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.

Other Programs within which course is listed: Cross-listed with GCE 514

COURSE CHANGE: **New Course Number: GDBA 541**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: John Molson School of Business
Program: Graduate Diploma in Business Administration
Degree: Graduate Diploma
Calendar Section/Graduate Page Number:

Type of Change:

[ ] Course Number
[ ] Course Description
[ ] Course Deletion
[ ] Course Title
[ ] Editorial
[ ] Other - Specify: Note
[ ] Credit Value
[X] New Course
[ ] Prerequisite

Present Text (from 20XX/20XX Calendar)	Proposed Text
	GDBA 541 Business Law (3 credits) Students learn the basic principles of the Quebec legal system, the various methods available to start a new business and how to select the most appropriate form of business. Students also learn basic legal notions relating to contracts, civil liability and employment law allowing them to better understand these legal principles in the context of operating a business. **Note:** Students who have received credit for this topic under GDBA 595 may not take this course for credit.

Rationale: This course has been offered on a yearly basis as a Special Topics course under GDBA 595 since 2009. In the last four years average enrollment was 18.25 students per section. This course adds to the program by making students cognizant of the legal environment in which businesses operate in Quebec.

Resource Implications: None, as these courses are already offered under GDBA 595. The new permanent courses will be offered on a rotational basis and thus will not change resource needs.

Other Programs within which course is listed:

Concordia University
School of Graduate Studies

MEMO TO: Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: February 2, 2018

SUBJECT: **GRADUATE CURRICULUM CHANGES (EMBA-10)**
(CALENDAR – 2018/2019)
MASTER OF BUSINESS ADMINISTRATION (EXECUTIVE OPTION)
JOHN MOLSON SCHOOL OF BUSINESS

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Council of the John Molson School of Business (JMSB).

JMSB is proposing to make changes to course numbers and course descriptions.

The GCC approved this document with minor edits. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: S. Betton, Associate Dean, Professional Graduate Programs
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

UNIVERSITÉ Concordia UNIVERSITY

JOHN MOLSON SCHOOL OF BUSINESS

To: Bradley Nelson, Associate Dean, Academic Programs and Development
Chair, Graduate Curriculum Committee

Cc: Frédérica Martin, Academic Programs Analyst
Olivia Ward, University Curriculum Advisor

From: Anne-Marie Croteau, Dean, John Molson School of Business

Date: December 19, 2017

Subject: Proposed changes to the Master of Business Administration (Executive Option)

Please find attached the proposal for changes to the Master of Business Administration (Executive Option)

The document was unanimously approved at the JMSB Faculty Council meeting of December 8th, 2017.

I respectfully request that the proposed changes be presented to the next Graduate Curriculum Committee meeting for consideration.

Thank you.

Attachment

Internal Memorandum

To: Anne-Marie Croteau, Dean, John Molson School of Business

Cc: Barbara Henchey, Director, Office of the Dean, JMSB

From: Sandra Betton, Associate Dean, Professional Graduate Programs
Chair of the Faculty Academic Programs Committee, JMSB

Date: November 17, 2017

Subject: Proposed changes to the Master in Business Administration (Executive Option)

Please find attached the proposal for changes in the Master of Business Administration (Executive Option).

The document was unanimously approved at the JMSB Faculty Academic Programs Committee meeting of November 16th, 2017.

I respectfully request that the proposed changes be submitted to the next JMSB Faculty Council meeting for consideration.

Internal Memorandum

To: Sandra Betton, Associate Dean, Professional Graduate Programs

From: Sandra Betton, Academic Director and Patrick Kelley, Executive Director
Master of Business Administration (Executive Option)

Date: November 6, 2017

Subject: Proposed changes to the Master in Business Administration (Executive Option)

As part of the continual updating and refining of the course content of the Executive MBA, we are proposing two changes to the EMBA.

1. The combination of Applied Field Project I and II (EMBA 633 and EMBA 645 respectively) into one course (EMBA 646). The total credits will remain the same.

2. The revision of EMBA 621 (Information Technology and Analytics) to EMBA 621 (Information Technology and Digital Strategy).

The proposed changes were approved by the EMBA program committee on November 1, 2017.
We respectfully request that the proposed changes be submitted to the next Faculty Academic Program Committee meeting.

Master of Business Administration (Executive Option)
Curriculum Change Proposal

Applied Field Project change (Delete EMBA 633, 645, replace with EMBA 646):

Currently in the EMBA, students complete a field project where they work on an applied problem for a "client" company. In this series of courses (EMBA 633 and EMBA 645), students prepare a proposal (EMBA 633) and then present their solution to the client (EMBA 645). Currently, the course structure of the project is unwieldly and imposes artificial constraints on student progress.

In consultation with the professor and based on student feedback, we are proposing that the two courses (EMBA 633 and EMBA 645) be combined into one course (EMBA 646 Applied Field Project) which will be offered over the Fall and Winter terms. This will enable the student teams to establish and honour milestones that are better aligned with their specific project.

Information Technology (Revise EMBA 621).

The course "Information Technology and Analytics" (EMBA 621) is not serving the needs of the Executive MBA students. The current description suggests that the course is hands on with the technology and the mechanics of analytics. However, EMBA students are already senior managers and are responsible for the development and management of business strategy rather than the mechanics of IT and analytics. Strategy in the 21st century is increasingly digital and in consequence, the course needs to be refocused on increasing business value through the management of digital risks and opportunities.

We are therefore, proposing the revision of EMBA 621.

PROGRAM CHANGE:
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department:
Program: Master of/Magisteriate in Business Administration (Executive Option)
Degree: EMBA
Calendar Section/Graduate Page Number: Winter 2018
Type of Change:
[X] Editorial [X] Requirements [ ] Regulations [ ] Program deletion [ ] New Program

Present Text (from 2017/2018 Calendar)	Proposed Text
Required Courses **Core Courses** **EMBA 610 Measuring and Reporting Financial Performance** **EMBA 611 Managing Talent** **EMBA 612 Marketing Management** **EMBA 613 Capital Markets and Financial Management** **EMBA 620 Value Creation through Business Processes** **EMBA 621 Information Technology and ~~Analytics~~** **EMBA 622 Business, Government and the Economy** **EMBA 623 Managing in a Global Environment** **EMBA 630 Financial Decisions under Uncertainty** **EMBA 631 Management Control Systems** **EMBA 632 Creativity and Innovation** **~~EMBA 633 Applied Field Project I~~** **EMBA 640 Leadership** **EMBA 641 Corporate Governance** **EMBA 642 Crafting and Implementing a Winning Strategy** **Integrative Courses** **EMBA 615 Live JMSB Experience** **EMBA 625 Global Experience** **EMBA 635 Starting a New Venture** **~~EMBA 645 Applied Field Project II~~**	**Required Courses** **Core Courses** **EMBA 610 Measuring and Reporting Financial Performance** **EMBA 611 Managing Talent** **EMBA 612 Marketing Management** **EMBA 613 Capital Markets and Financial Management** **EMBA 620 Value Creation through Business Processes** **EMBA 621 Information Technology and Digital Strategy** **EMBA 622 Business, Government and the Economy** **EMBA 623 Managing in a Global Environment** **EMBA 630 Financial Decisions under Uncertainty** **EMBA 631 Management Control Systems** **EMBA 632 Creativity and Innovation** **EMBA 640 Leadership** **EMBA 641 Corporate Governance** **EMBA 642 Crafting and Implementing a Winning Strategy** **Integrative Courses** **EMBA 615 Live JMSB Experience** **EMBA 625 Global Experience** **EMBA 635 Starting a New Venture** **EMBA 646 Applied Field Project**

Rationale: Curriculum change to revise EMBA 621: The proposed changes will better serve EMBA students, as they focus on increasing business value through the management of digital risks and opportunities, instead of the previous focus of the mechanics of IT and analytics. For the replacement of EMBA 633 and 645 by EMBA 646: Currently, the course structure of the project is unwieldly and imposes artificial constraints on student progress. The combination of EMBA 633 and 645 into EMBA 646 (offered over the Fall and Winter terms) will enable student teams to establish and honour milestones that are better aligned with their specific project.

Resource Implications: None

COURSE CHANGE: **Delete Course Number: EMBA 621**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Calendar for academic year: 2018/2019**
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department:
Program: Master of/Magisteriate in Business Administration (Executive Option)
Degree: EMBA
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[ ] Course Number	[X] Course Title	[ ] Credit Value	[ ] Prerequisite
[X] Course Description	[ ] Editorial	[ ] New Course	
[ ] Course Deletion	[ ] Other - Specify: Note		

Present Text (from 2017/2018 Calendar)	Proposed Text
EMBA 621 Information Technology and ~~Analytics (3 credits)~~ Students learn how ~~to use information systems and develop analytical skills to support organizational strategy and decision making. The use of information technology as well as current industry practices and trends are examined. The importance of data-driven decision making and policy formulation is covered by a practical approach to statistical and analytical tools. Topics covered include strategic and tactical role of information technology and techniques of business analytics such as data mining, data visualization, and forecasting. The integrative course shows how information technology and analytical tools are used in accountancy, marketing, finance and supply chain by using projects, exercises and case studies.~~	**EMBA 621 Information Technology and Digital Strategy** (3 credits) Students learn how advances in information technologies, connectivity and data analytics are transforming business models and creating new avenues for business value creation. This course provides students with a business-driven leadership perspective on information technology (IT) by leveraging digital technologies for competitive advantage. Within the context of IT and digital strategy, topics covered may include: strategic alignment of IT, the impact of disruptive technologies on business models, effective leadership of IT, governance, project portfolio management, strategic sourcing, e-commerce, data analytics, privacy and cybersecurity.
Rationale: The course title and content have been revised to reflect changes in the area to emphasize the managerial focus of the EMBA program.	
Resource Implications: None.	

Other Programs within which course is listed: None

COURSE CHANGE: Delete Course Number: EMBA 633

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: **John Molson School of Business**
Department:
Program: Master of/Magisteriate in Business Administration (Executive Option)
Degree: EMBA
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[X] Course Deletion [ ] Other - Specify: Note

Present Text (from 2017/2018 Calendar)	Proposed Text
~~EMBA 633 Applied Field Project I (1.5 credits)~~ ~~The first part of this two-part integrative course provides students with an opportunity to tackle a major business problem or issue of their choice, thereby allowing them to apply the knowledge and competencies acquired to date. In teams, students develop and present to the class a business project proposal focusing on a problem or issue faced by the organization they have chosen. A project proposal is the main assignment for the course.~~	
Rationale: EMBA 633 is being deleted. Combining the content of EMBA 633 and 645 into EMBA 646 better aligns the timing of course with the timing of the project undertaken by the students.	
Resource Implications: None – combining two existing courses (EMBA 633 and 645) currently offered in two different terms, into one course (EMBA 646) to be offered over two terms.	
Other Programs within which course is listed: None	

COURSE CHANGE: **Delete Course Number: EMBA 645**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department:
Program: Master of/Magisteriate in Business Administration (Executive Option)
Degree: EMBA
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [ ] New Course
[X] Course Deletion [ ] Other - Specify: Note

Present Text (from 2017/2018 Calendar)	Proposed Text
~~**EMBA 645 Applied Field Project II** (2 credits)~~ ~~In this capstone integrative course, students carry out the project proposal identified in Applied Field Project I. Students gather data, diagnose issues and develop innovative and practical responses to complex, cross-disciplinary issues. At the end of the course, a comprehensive set of recommendations is presented to a panel of faculty members, EMBA peers, and representatives from the respective organizations. The key deliverable of this course is the actual set of recommendations and implementation plan that are designed to address the selected problem or issue.~~	
Rationale: EMBA 645 is being deleted. Combining the content of EMBA 633 and 645 into EMBA 646 better aligns the timing of course with the timing of the project undertaken by the students.	
Resource Implications: None – combining two existing courses (EMBA 633 and 645) currently offered in two different terms into one course (EMBA 646) to be offered over two terms.	
Other Programs within which course is listed: None	

COURSE CHANGE: **Add Course Number: EMBA 646**

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department:
Program: Master of/Magisteriate in Business Administration (Executive Option)
Degree: EMBA
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify: Note

Present Text (from 20XX/20XX Calendar)	Proposed Text
	EMBA 646 Applied Field Project (3.5 credits) This capstone integrative course provides students with the opportunity to tackle a major business problem or issue of their choice, thereby allowing them to apply the knowledge and competencies acquired in the program. In teams, students develop a business project proposal focusing on a problem or issue faced by the organization they have chosen. Students are then expected to gather data and develop innovative and practical responses to the complex, cross-disciplinary issues faced by their client organization. Student teams are required to present a comprehensive set of recommendations to a panel comprised of faculty members, EMBA peers and representatives of the client organization. The key deliverable of this course is the actual set of recommendations and implementation plan designed to address the selected problem or issue.
Rationale: Currently the applied field project is offered as two separate courses (EMBA 633 and EMBA 645), however, the separation of the major project into the two components is artificial and does not provide the students with the flexibility to tailor the timing to the needs of the project. Each project has its own dynamic and the professor needs to be able to guide each team to a successful outcome without a set of artificial constraints. Therefore, is it proposed to combine the courses into the new proposed course, EMBA 646.	
Resource Implications: None – combining two existing courses (EMBA 633 and 645) currently offered in two different terms into one course (EMBA 646) to be offered over two terms.	
Other Programs within which course is listed: None	

Concordia University
School of Graduate Studies

MEMO TO: Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: February 2, 2018

SUBJECT: **GRADUATE CURRICULUM CHANGES (MSCA-15)**
(CALENDAR – 2018/2019)
MASTER OF SCIENCE IN MARKETING
JOHN MOLSON SCHOOL OF BUSINESS

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Council of the John Molson School of Business (JMSB).

JMSB made updated course numbers and the GCC approved this document with minor modifications. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: S. Betton, Associate Dean, Professional Graduate Programs
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

UNIVERSITÉ Concordia UNIVERSITY

JOHN MOLSON SCHOOL OF BUSINESS

To: Bradley Nelson, Associate Dean, Academic Programs and Development
Chair, Graduate Curriculum Committee

Cc: Frédérica Martin, Academic Programs Analyst
Olivia Ward, University Curriculum Advisor

From: Anne-Marie Croteau, Dean, John Molson School of Business

Date: December 19, 2017

Subject: Proposed changes to the Master of Science in Marketing

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Please find attached the proposal for changes to the Master of Science in Marketing.

The document was unanimously approved at the JMSB Faculty Council meeting of December 8th, 2017.

I respectfully request that the proposed changes be presented to the next Graduate Curriculum Committee meeting for consideration.

Thank you.

Attachment

Internal Memorandum

To: Anne-Marie Croteau, Dean, John Molson School of Business

Cc: Barbara Henchey, Director, Office of the Dean, JMSB

From: Sandra Betton, Associate Dean, Professional Graduate Programs
Chair of the Faculty Academic Programs Committee, JMSB

Date: November 17, 2017

Subject: Proposed changes to the Master of Science in Marketing

Please find attached the proposal for changes in the Master of Science in Marketing. For your convenience, I also attach a copy of the current calendar entry for the MSC Marketing.

The document was unanimously approved at the JMSB Faculty Academic Programs Committee meeting of November 16th, 2017.

I respectfully request that the proposed changes be submitted to the next JMSB Faculty Council meeting for consideration.

Attachment

INTERNAL MEMORANDUM

TO: Dr. Sandra Betton, Associate Dean, Professional Graduate Programs
FROM: Dr. Jooseop Lim, Chair of the Department of Marketing
DATE: November 1, 2017
SUBJECT: Proposed changes to the Master of Science in Marketing

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The Master of Science in Marketing is updating its numbering of MSCA 672 "Seminar in Special Topics" courses in order to comply with the SIS system requirement of only using digits. Previously, we were able to identify topics by adding a specific letter suffix to the course number. In order to comply with SIS requirements we removed the letter suffix which causes the same course number (MSCA 672) to be used repeatedly for a wide range of special topics. This creates confusion on student transcripts. Furthermore, we wish to acknowledge that these courses are not occasionally offered seminars rather that they have been proven to be successful and so should be identified with fixed course numbers – changing them from slot courses to permanent offerings.

In order to clearly identify elective courses on student transcripts while complying with SIS requirements, new course numbers are proposed for some of the MSCA 672 courses. In addition, most of these courses have been offered more than three times now. The Department would like to make these courses permanent offerings by assigning unique course numbers to them. The course title and content remain the same.

Minor edits regarding existing Seminar course titles are proposed to maintain consistency in course titles across seminar courses.

This proposal was endorsed by the Associate Dean, Research and Program Director of Ph.D. and the Program Director of the M.Sc. program on October 31, 2017.

The attached document provides a summary of the proposed changes.

I respectfully request that the proposed changes be submitted to the next Faculty Academic Programs Committee meeting.

DEPARTMENT OF MARKETING
M.SC. COURSE CHANGE PROPOSAL

The attached proposal presents:

1. **Conversion of six (6) seminar courses, currently offered as "Special Topics" courses under a single course number (MSCA 672), to permanent offerings with specific course numbers for each topic**. These seminar courses are all routinely offered, so course subject and content will not change – although we are proposing minor title edits for clarity. We will reserve MSCA 672 for true Seminar Special Topics which might not be offered on a regular basis. The course numbers we are proposing have not been attributed before: MSCA 662; MSCA 663; MSCA 667; MSCA 669; MSCA 671; MSCA 677.

Enrollment Records for Previous Special Topics Seminars in MSCA 672

Current Course Number	Current Course Title	Current Description of Topic	Proposed Course Number	Proposed Course Title	Semester	Enrollment
MSCA 672	Special Topics in Marketing	Seminar in Qualitative Research	MSCA 662	Seminar in Qualitative Research*	Winter 2018	17
					Winter 2017	21
		Seminar in Consumer Research Methodology	MSCA 663	Seminar in Consumer Research Methods*	Fall 2017	8
					Winter 2017	18
		Seminar in Consumer Psychology and Decision Making	MSCA 667	Seminar in Consumer Psychology and Decision Making*	Winter 2018	10
					Fall 2016	5
		Seminar in Pricing Management	MSCA 669	Seminar in Pricing Management	Winter 2017	4
					Fall 2015	12
		Seminar in Relationship Marketing Strategy	MSCA 671	Seminar in Relationship Marketing Strategy*	Winter 2018	8
					Winter 2017	6
		Seminar in Sustainability in Marketing	MSCA 677	Seminar in Sustainability in Marketing	Winter 2018	12

* Cross-listed with ADMI course

2. **Minor edits in the titles of two (2) existing seminar courses** (MSCA 674 and 675)
   a. **A course title change is proposed for MSCA 674 to reflect the content of the course.**

   Rationale: This course was specifically approved for the M.Sc. program and was subsequently offered as MSCA 674 "Seminar in Brand Management". However, this course is cross-listed with ADMI 831, Meaning and Management of Brands. In order to reflect the content of the course, we propose to change the title of MSCA 674 to "Seminar in Meaning and Management of Brands".

   b. **A course title change is proposed for MSCA 675 to be consistent with other courses (remove "Research" from "Seminar in Research in Retailing).**

   Rationale: Other seminar course titles do not contain "Research". To be consistent with other course titles, and to better represent the content of the course, we propose dropping "Research" from its title.

Current Course Number	**Current Course Title**	**Proposed Course Number**	**Proposed Course Title**	**Course Numbers and Titles of Cross-listed Courses**	**Type of Change**
MSCA 674	Seminar in Brand Marketing	MSCA 674	Seminar in Meaning and Management of Brands*	ADMI 831, Meaning and Management of Brands	Change of course title
MSCA 675	Seminar in Research in Retailing	MSCA 675	Seminar in Retailing*	ADMI 831, Research in Retailing	Change of course title

* Cross-listed with ADMI course

PROPOSED CALENDAR CHANGES

Current Course Number	Current Course Title	Current description of Topic	Proposed Course Number	Proposed Course Title	ADMI Course Numbers (and titles if different)	Type of Change
MSCA 672	Special Topics in Marketing	Seminar in Qualitative Research	MSCA 662	Seminar in Qualitative Research*	ADMI 832, Qualitative Research	Converting a special topics seminar into a permanent offering
		Seminar in Consumer Research Methodology	MSCA 663	Seminar in Consumer Research Methods*	ADMI 831, Consumer Research Methods	Converting a special topics into a permanent offering; Minor change of course title
		Seminar in Consumer Psychology and Decision Making	MSCA 667	Seminar in Consumer Psychology and Decision Making*	ADMI 830, Consumer Psychology and Decision Making	Converting a special topics into a permanent offering
		Seminar in Pricing Management	MSCA 669	Seminar in Pricing Management		Converting a special topics into a permanent offering
		Seminar in Relationship Marketing Strategy	MSCA 671	Seminar in Relationship Marketing Strategy*	ADMI 832, Relationship Marketing Strategy	Converting a special topics into a permanent offering
		Seminar in Sustainability in Marketing	MSCA 677	Seminar in Sustainability in Marketing		Converting a special topics into a permanent offering

* Cross-listed with ADMI course

PROGRAM CHANGE: Marketing Seminars
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 2018/2019
Implementation Month/Year: September 2018

Faculty/School: John Molson School of Business
Department: Marketing
Program: Master of / Magisteriate in Science in Marketing
Degree: MSc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[X] Editorial [X] Requirements [ ] Regulations [ ] Program deletion [ ] New Program

Present Text (from 2017 / 2018 Calendar)	Proposed Text
Marketing Seminars Each year a selection of specialized seminars will be offered on a rotating basis from those listed below. **MSCA 665 Seminar in Marketing Communications** **MSCA 668 Seminar in Innovation and Marketing** **MSCA 672 Seminar in Special Topics in Marketing** ~~**Note:** Changes in topic will be indicated by the letter following this seminar number (e.g., MSCA 672A, MSCA 672B).~~ **MSCA 673 Seminar in Segmentation and Positioning in Marketing** ~~**Note:** Students who have taken MSCA 672G may not take this seminar for credit~~ **MSCA 674 Seminar in ~~Brand Management~~** ~~**Note:** Students who have taken MSCA 672T may not take this seminar for credit~~ **MSCA 675 Seminar in ~~Research in~~ Retailing** ~~**Note:** Students who have taken MSCA 672U may not take this seminar for credit~~	**Marketing Seminars** Each year a selection of specialized seminars will be offered on a rotating basis from those listed below. **MSCA 662 Seminar in Qualitative Research**[1] **MSCA 663 Seminar in Consumer Research Methods**[2] **MSCA 665 Seminar in Marketing Communications** **MSCA 667 Seminar in Consumer Psychology and Decision Making**[3] **MSCA 668 Seminar in Innovation and Marketing** **MSCA 669 Seminar in Pricing Management**[4] **MSCA 671 Seminar in Relationship Marketing Strategy**[5] **MSCA 672 Seminar in Special Topics in Marketing *** **MSCA 673 Seminar in Segmentation and Positioning in Marketing**[6] **MSCA 674 Seminar in Meaning and Management of Brands**[7] **MSCA 675 Seminar in Retailing**[8] **MSCA 677 Seminar in Sustainability in Marketing**[9] **Notes :** 1) Students who have received credit for the Seminar in Qualitative Research under a MSCA 672 number may not take MSCA 662 for credit

	2) Students who have received credit for the Seminar in Consumer Research Methodology under a MSCA 672 number may not take MSCA 663 for credit 3) Students who have received credit for the Seminar in Consumer Psychology and Decision Making under a MSCA 672 number may not take MSCA 667 for credit 4) Students who have received credit for the Seminar in Pricing Management under a MSCA 672 number may not take MSCA 669 for credit 5) Students who have received credit for the Seminar in Relationship Marketing Strategy under a MSCA 672 number may not take MSCA 671 for credit 6) Students who have received credit for the Seminar in Segmentation and Positioning in Marketing may not take MSCA 673 for credit 7) Students who have received credit for the Seminar in Brand Management under a MSCA 672 number may not take MSCA 674 for credit 8) Students who have received credit for the Seminar in Research in Retailing under a MSCA 672 number may not take MSCA 675 for credit 9) Students who have received credit for the Seminar in Sustainability in Marketing under a MSCA 672 number may not take MSCA 677 for credit (*) Subject matter will vary from term to term and students may take more than one of these courses, provided that course content has changed.
Rationale: Editorial calendar changes are required due to the addition of six new courses that were previously offered as special topics courses in the Master of Science in Marketing Seminars. These changes are reflected in the Master of Science in Marketing section of the academic calendar. Minor editorial changes in course titles for MSCA 674 and MSCA 675.	
Resource Implications: None. All outlined seminar courses will be offered on a rotational basis, thus not increasing or decreasing resource needs.	

DOSSIER TITLE: MSCA-15
DESCRIPTION OF CHANGE: Editorial
PROGRAM CHANGE - CALENDAR UPDATE FORM – *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September 2018

Faculty: John Molson School of Business **Department:** (if applicable) MSc

Program: (if applicable) Master of / Magisteriate in Science **Degree:** (if applicable) MSc **Section Title:** (if applicable)

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[X] Editorial [] Requirements [ ] Regulations
[ ] New Program [ ] Program Deletion

Present Text (Text from 2017– 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
Master of/Magisteriate in Science … **Seminar Descriptions** … **MSCA 668 Seminar in Innovation and Marketing** **MSCA 672 Seminar in Special Topics in Marketing** ~~Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 672A, MSCA 672B, etc.~~ **MSCA 673 Seminar in Segmentation and Positioning in Marketing** ~~Note: Students who have taken MSCA 672G may not take this seminar for credit.~~ **MSCA 674 Seminar in ~~Brand Management~~** ~~Note: Students who have taken MSCA 672T may not take this seminar for credit.~~ **MSCA 675 Seminar in ~~Research in~~ Retailing** ~~Note: Students who have taken MSCA 672U may not take this seminar for credit.~~ **MSCA 693 Seminar in Special Topics in Decision Sciences and Management Information Systems** Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 693A, MSCA 693B, etc.	Master of/Magisteriate in Science … **Seminar Descriptions** **…** **MSCA 662 Seminar in Qualitative Research** **Note:** Students who have received credit for the Seminar in Qualitative Research under a MSCA 672 number may not take MSCA 662 for credit. **MSCA 663 Seminar in Consumer Research Methods** **Note:** Students who have received credit for the Seminar in Consumer Research Methodology under a MSCA 672 number may not take MSCA 663 for credit. **MSCA 665 Seminar in Marketing Communications** **MSCA 667 Seminar in Consumer Psychology and Decision Making** **Note:** Students who have received credit for the Seminar in Consumer Psychology and Decision Making under a MSCA 672 number may not take MSCA 667 for credit. **MSCA 668 Seminar in Innovation and Marketing** **MSCA 669 Seminar in Pricing Management** **Note:** Students who have received credit for the Seminar in Pricing Management under a MSCA 672 number may not take MSCA 669 for credit. **MSCA 671 Seminar in Relationship Marketing Strategy** **Note:** Students who have received credit for the Seminar in Relationship

Marketing Strategy under a MSCA 672 number may not take MSCA 671 for credit.

MSCA 672 Seminar in Special Topics in Marketing
Note: Subject matter will vary from term to term and students may take more than one of these courses, provided that course content has changed.

MSCA 673 Seminar in Segmentation and Positioning in Marketing
Note: Students who have received credit for the Seminar in Segmentation and Positioning in Marketing may not take MSCA 673 for credit.

MSCA 674 Seminar in Meaning and Management of Brands
Note: Students who have received credit for the Seminar in Brand Management under a MSCA 672 number may not take MSCA 674 for credit.

MSCA 675 Seminar in Retailing
Note: Students who have received credit for the Seminar in Research in Retailing under a MSCA 672 number may not take MSCA 675 for credit.

MSCA 677 Seminar in Sustainability in Marketing
Note: Students who have received credit for the Seminar in Sustainability in Marketing under a MSCA 672 number may not take MSCA 677 for credit.

MSCA 693 Seminar in Special Topics in Decision Sciences and Management Information Systems
Note: Changes in topic will be indicated by the letter following this seminar number e.g., MSCA 693A, MSCA 693B, etc.

Rationale: Updates to the general MSc calendar to reflect calendar changes in the MSc Marketing program. Editorial calendar changes are required due to the addition of six new courses that were previously offered as special topics courses in the Master of Science in Marketing. Minor editorial changes in course titles for MSCA 674 and MSCA 675.

Resource Implications: None. All outlined seminar courses will be offered on a rotational basis, thus not increasing or decreasing resource needs.

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 662
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [ ] Other - Specify: [X] New Course [ ] Course Deletion

Present Text **(Text from 20XX/ 20XX Calendar)**	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
	MSCA 662 Seminar in Qualitative Research **Note:** Students who have received credit for the Seminar in Qualitative Research under a MSCA 672 number may not take MSCA 662 for credit.

Rationale: It is proposed this course become permanent, as the new SIS no longer permits topic differentiation by letter suffixes. This course has previously been offered as a special topics course. In Winter 2017 enrollment was 21 students, and in Winter 2018 enrollment is 17 students.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: Ph.D. program – ADMI 832, Qualitative Research

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 663
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [ ] Other - Specify: [X] New Course [ ] Course Deletion

Present Text (Text from 20XX/ 20XX Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
	MSCA 663 Seminar in Consumer Research Methods **Note:** Students who have received credit for the Seminar in Consumer Research Methodology under a MSCA 672 number may not take MSCA 663 for credit.

Rationale: It is proposed this course become permanent, as the new SIS no longer permits topic differentiation by letter suffixes. This course has previously been offered as a special topics course. In Fall 2017 enrollment was 8 students, and in Winter 2017 enrollment was 18 students.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: Ph.D. program – ADMI 831, Consumer Research Methods

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 667
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [ ] Other - Specify: [X] New Course [ ] Course Deletion

Present Text (Text from 20XX/20XX Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
	MSCA 667 Seminar in Consumer Psychology and Decision Making **Note:** Students who have received credit for the Seminar in Consumer Psychology and Decision Making under a MSCA 672 number may not take MSCA 667 for credit.

Rationale: : It is proposed this course become permanent, as the new SIS no longer permits topic differentiation by letter suffixes. This course has previously been offered as a special topics course. In Fall 2016 enrollment was 5 students, and in Winter 2018 enrollment is 10 students.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: Ph.D. program – ADMI 830, Consumer Psychology and Decision Making

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 669
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [ ] Other - Specify: [X] New Course [ ] Course Deletion

Present Text (Text from 20XX / 20XX Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
	MSCA 669 Seminar in Pricing Management **Note:** Students who have received credit for the Seminar in Pricing Management under a MSCA 672 number may not take MSCA 669 for credit.

Rationale: It is proposed this course become permanent, as the new SIS no longer permits topic differentiation by letter suffixes. This course has previously been offered as a special topics course. In Fall 2015 enrollment was 12 students, and in Winter 2017 enrollment was 4 students.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: None.

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 671
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [ ] Other - Specify: [X] New Course [ ] Course Deletion

Present Text (Text from 20XX / 20XX Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
	MSCA 671 Seminar in Relationship Marketing Strategy **Note:** Students who have received credit for the Seminar in Relationship Marketing Strategy under a MSCA 672 number may not take MSCA 671 for credit.

Rationale: It is proposed this course become permanent, as the new SIS no longer permits topic differentiation by letter suffixes. This course has previously been offered as a special topics course. In Winter 2016 enrollment was 6 students, and in Winter 2018 enrollment is 8 students.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: Ph.D. program – ADMI 832, Relationship Marketing Strategy

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 674
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [X] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [X] Other - Specify: Revise note [] New Course [ ] Course Deletion

Present Text (Text from 2017 /2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
MSCA 674 Seminar in ~~Brand Management~~ **~~Note:~~** ~~Students who have taken MSCA 672T may not take this seminar for credit~~	**MSCA 674 Seminar in Meaning and Management of Brands** **Note:** Students who have received credit for the Seminar in Brand Management under a MSCA 672 number may not take MSCA 674 for credit.

Rationale: This course was specifically approved for the M.Sc. program and was subsequently offered as MSCA 674 "Seminar in Brand Management". However, this course is cross-listed with ADMI 831, Meaning and Management of Brands. In order to reflect the content of the course, we propose to change the title of MSCA 674 to "Seminar in Meaning and Management of Brands".

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: Ph.D. program – ADMI 831, Meaning and Management of Brands

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 675
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [X] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [X] Other - Specify: Revise Note [] New Course [ ] Course Deletion

Present Text (Text from 2017/ 2018 Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
MSCA 675 Seminar in ~~Research in~~ Retailing **~~Note:~~** ~~Students who have taken MSCA 672U may not take this seminar for credit~~	**MSCA 675 Seminar in Retailing** **Note:** Students who have received credit for the Seminar in Research in Retailing under a MSCA 672 number may not take MSCA 675 for credit.

Rationale: Minor editorial changes to the course title and exclusion note to better represent the course content. Furthermore, other seminar course titles do not contain the term "Research". To be consistent with other course titles, we propose dropping "Research" from its title.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: Ph.D. program – ADMI 831, Research in Retailing

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

DOSSIER TITLE: MSCA-15
COURSE NUMBER: MSCA 677
NEW COURSE NUMBER:
COURSE CHANGE - CALENDAR UPDATE FORM – A *(please fill in all the appropriate information)* **Calendar for Academic Year:** 2018/2019
Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes **Implementation Month/Year:** September /2018

Faculty: John Molson School of Business **Department:** (if applicable) Marketing

Program: (if applicable) Master of / Magisteriate in Science in Marketing **Degree:** (if applicable) MSc **Section Title:** (if applicable) Winter 2018

Type of Change: *(please fill in all the appropriate boxes with an "X")* **A separate form is required for each change.**

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite [ ] Course Description
[ ] Editorial [ ] Other - Specify: [X] New Course [ ] Course Deletion

Present Text (Text from 20XX / 20XX Calendar)	**Proposed Text**
Paste description from current calendar in 'present text' (~~strike-out text sections to be changed or deleted~~) and in 'proposed text' (underline additions and changes proposed). Attach a separate sheet if necessary.	
	MSCA 677 Seminar in Sustainability in Marketing **Note:** Students who have received credit for the Seminar in Sustainability in Marketing under a MSCA 672 number may not take MSCA 677 for credit.

Rationale: It is proposed this course become permanent, as the new SIS no longer permits topic differentiation by letter suffixes. This course has previously been offered as a special topics course under MSCA 672. In Winter 2018 enrollment is 12 students.

Resource Implications: None. This course will be offered on a rotational basis among a list of other seminar courses, and thus will not need any additional resources.

Other Programs within which course is listed: None.

* Please attach supporting memos (Department, Faculty, Faculty Council, GCC, CSGS)

SCHOOL OF GRADUATE STUDIES

To: Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning

cc: Olivia Ward, University Curriculum Administrator
Brad Nelson, Associate Dean, School of Graduate Studies

From: Joanne Beaudoin, Secretary, Council of the School of Graduate Studies

Date: January 4, 2017

Re: Graduate Curriculum Changes – CSGS November 28, 2016

This is to confirm that at the Council of the School of Graduate Studies meeting of Monday, December 18, 2017 the following *curriculum changes* were approved:

Faculty of Arts and Science
Faculty of Engineering and Computer Science

- Departments of: CSGS 1718 3 D2
  Chemistry and Biochemistry
  Building, Civil and Environmental Engineering
  Electrical and Computer Engineering
  Mechanical, Industrial and Aerospace Engineering
  Physics
  (CHEM-61) New Program: *MASc/MSc in Nanoscience and Nanotechnology*

The documents can be forwarded to Senate for final approval.

Thank you.

Concordia University
School of Graduate Studies

MEMO TO: Paula Wood-Adams
Dean of Graduate Studies

FROM: Brad Nelson, Associate Dean, Academic Programs and Development
School of Graduate Studies

DATE: November 29, 2017

SUBJECT: **GRADUATE CURRICULUM CHANGES (CHEM-61)**
(CALENDAR – 2018/2019)

DEPARTMENTS OF:
CHEMISTRY AND BIOCHEMISTRY
BUILDING, CIVIL AND ENVIRONMENTAL ENGINEERING
ELECTRICAL AND COMPUTER ENGINEERING
MECHANICAL, INDUSTRIAL AND AEOROSPACE ENGINEERING
PHYSICS
FACULTY OF ARTS AND SCIENCE
FACULTY OF ENGINEERING AND COMPUTER SCIENCE

The Graduate Curriculum Committee (GCC) reviewed the curriculum changes approved by the Faculty of Engineering and Computer Science and the Faculty of Arts and Science.

The Department of Physics with the Department of Chemistry and Biochemistry in the Faculty of Arts and Science and the Departments of Electrical and Computer Engineering, Mechanical and Industrial Engineering and Building, Civil and Environmental Engineering is proposing a joint new master's thesis (MASc/MSc) program in Nanoscience and Nanotechnology (NSNT).

The proposal for the MSc/MASc was passed unanimously by the Graduate Curriculum Committee with the understanding that the School of Graduate Studies would merge the three proposals into one unified proposal, including the projected budget. The following, largely editorial, changes are the only modifications to the original proposals. Please see the notes at the bottom of the budget for clarification on the merger of the two (ENCS/FAS) budgets.

The GCC approves the proposed curriculum changes with the above changes. I therefore recommend that the Academic Programs Committee approve and recommend to Senate the above-mentioned curriculum changes in their final form.

cc: M. Debbabi, Associate Dean, Graduate Programs and Research, Faculty of Engineering and Computer Science
P. Joyce, Associate Dean, Academic Programs, Faculty of Arts and Science
O. Ward, University Curriculum Administrator, Office of the Provost and Vice-President, Academic Affairs

Department of Chemistry and Biochemistry,
Department of Physics,
Department of Building, Civil and Environmental Engineering (BCEE),
Department of Electrical and Computer Engineering (ECE),
Department of Mechanical, Industrial and Aerospace Engineering (MIAE)

CHEM-61

Faculty Memos:

Dean, Faculty of Arts and Science

Associate Dean, Graduate Programs and Research, Faculty of Engineering and Computer Science

Chair, Faculty Council, Faculty of Engineering and Computer Science

Department Memos:

Chair, Department of Chemistry and Biochemistry

Chair and Curriculum Committee Chair, Department of Physics

Chair, Department of Building, Civil and Environmental Engineering, Chair, Department of Electrical and Computer Engineering and Chair, Department of Mechanical, Industrial and Aerospace Engineering

New Program

Nanoscience and Nanotechnology MSc/MASc

New Course

CHEM 652 *Nanomaterials Characterization*

NANO 610 *Principles of Nanoscience and Nanotechnology* (6 credits)

UNIVERSITÉ Concordia UNIVERSITY

INTERNAL MEMORANDUM

TO: Dr Bradley Nelson
Associate Dean, School of Graduate Studies
Chair, Graduate Curriculum Committee

FROM: Dr André Roy, Dean, Faculty of Arts and Science
Chair, Arts and Science Faculty Council

DATE: November 21, 2017

SUBJECT: Graduate Calendar Curriculum Changes
Departments of Chemistry and Biochemistry and Physics
CHEM-61
Master of/Magisteriate in Science (Nanoscience and Nanotechnology)

The Arts and Science Faculty Council has reviewed and approved the following proposal on May 31st, 2017 and requests that it be considered at the next meeting of the Graduate Curriculum Committee.

The **Departments of Chemistry and Biochemistry and Physics** in the Faculty of Arts and Science and the Departments of Electrical and Computer Engineering, Mechanical, Industrial and Aerospace Engineering and Building, Civil and Environmental Engineering are proposing a joint thesis-based Master of / Magisteriate in (Applied) Science (Nanoscience and Nanotechnology). The proposals, merged under CHEM-61, differ primarily only in the Provotrack pages defining specific changes to each department's program offerings.

The attached proposal addresses in detail the societal need for the program, its place in the Concordia context, and the distinctiveness of the proposed program which "focuses on training and research at the boundary between science and engineering". This new cross-faculty program will "attract new graduate students to Concordia with a focused program and … foster new and exciting collaborations within the University". By design, this program will facilitate cross-Faculty training and research which would have been more difficult with a traditional program that was housed in individual departments within individual Faculties.

This proposal also responds to the critical questions of potential student interest and demand, direct competitors, and financial implications to the Faculty of Arts and Science.

With the current success of graduate programs in all of the departments involved and the existing research in nanoscience and nanotechnology, this program will be well-positioned to attract highly qualified students willing to take on research at the cutting edge of a highly interdisciplinary field.

Reference documents:
FCC 2016.9/G-CHEM-61/PHYS-23
ASFC 2017-4M-B/C

Concordia University
Engineering and Computer Science
Office of the Dean

INTERNAL MEMORANDUM

TO: Dr. Bradley Nelson
Chair, Graduate Curriculum Committee
School of Graduate Studies

FROM: Dr. M. Debbabi
Associate Dean, Graduate Programs and Research
Faculty of Engineering and Computer Science

CC: Ms. Frederica Martin
Academic Programs Analyst
School of Graduate Studies

DATE: October 16, 2017

RE: **Graduate Curriculum Proposal for the 2018-19 Academic Year**
Faculty of Engineering and Computer Science

At its meeting on October 6th, 2017, the Council of the Faculty of Engineering and Computer Science reviewed and approved, with some modifications, the creation of a new ***Master's (Thesis) Program in Nanoscience and Nanotechnology*** (NSNT) proposed by the Department of Electrical and Computer Engineering (ECE) in collaboration with other departments (including the Departments of Building Civil and Environmental Engineering (BCEE), Mechanical, Industrial and Aerospace Engineering (MIAE), Chemistry and Biochemistry, and Physics). The new program is the result of cross-Faculty collaboration, encouraging cross-disciplinary education and research. Students interested in the interdisciplinary research area of nanoscience and nanotechnology might be able now to get a cross-disciplinary master's thesis degree. ENCS students will be awarded with an MASc degree and Arts and Science students with an MSc degree.

Details of the new program proposal are indicated and explained in the Department's internal memorandum and Provotrack dossier ELEC-93.

We kindly request that this dossier be placed on the next agenda of the Graduate Curriculum Committee.

Thank you for your consideration of this proposal.

Concordia University

FACULTY OF ENGINEERING
AND COMPUTER SCIENCE
Office of the Dean

INTERNAL MEMORANDUM

TO: Dr. Amir Asif
Chair of the Faculty Council
Faculty of Engineering and Computer Science

FROM: Dr. M. Debbabi
Associate Dean, Graduate Programs and Research
Faculty of Engineering and Computer Science

DATE: September 22, 2017

RE: **Graduate Curriculum Proposal for the 2018-19 Academic Year**
Department of Electrical and Computer Engineering (ECE)

At its meeting on September 12, 2017, the Engineering and Computer Science Graduate Studies Committee (ECSGSC) reviewed and approved, with minor modifications, the creation of a new master's thesis (MSc/MASc) program in Nanoscience and Nanotechnology (NSNT) proposed by the departments of Electrical and Computer Engineering (ECE), Building Civil and Environmental Engineering (BCEE) and Mechanical, Industrial and Aerospace Engineering (MIAE). This new program is the result of cross-Faculty collaboration (e.g. certain departments within the University), encouraging cross-disciplinary education and research. Students interested in the interdisciplinary research area of nanoscience and nanotechnology might be able now to get a cross-disciplinary master's thesis degree. ENCS students will be awarded with an MASc degree and Arts and Science students with an MSc degree.

Details of this proposal are indicated and explained in the Department's internal memorandum and Provotrack dossier ELEC-93.

We kindly request that this item be placed on the next agenda of the Faculty Council for approval.

Thank you for your consideration of this proposal.

UNIVERSITÉ Concordia UNIVERSITY

To: Paul Joyce, Associate Dean Curriculum, Faculty of Arts and Science

FROM: Christine DeWolf, Chair, Department of Chemistry and Biochemistry

Date: 25 May 2017

Re: Proposal for a new program: MSc/MASc Nanoscience and Nanotechnology

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Dear Dr Joyce,

The Department of Chemistry and Biochemistry and the Centre for NanoScience Research have participated in the development of a proposed new graduate program that will be interdisciplinary and inter-faculty. The program seeks to train both scientists and engineers to work in a fast-moving field that frequently requires interdisciplinary approaches to tackle major initiatives in the application of nanomaterials. The key is to train personnel to work at the engineering-science boundary, which in this case is the field of nanomaterials. Demand for personnel trained in nanoscience, nanotechnology and nanoengineering is increasing yet there are limited examples of programs that specifically train for the intersection of these domains.

This program is expected to complement and enhance our current programs, foster inter-faculty collaborations and contribute to a major initiative at the University in materials science and engineering. The proposal was presented to the Department of Chemistry and Biochemistry at our department meeting on 6 March 2017 and was given unanimous approval.

Christine DeWolf

Chair, Department of Chemistry and Biochemistry
Co-Director, Centre for NanoScience Research

Concordia University
Arts and Science
Department of Physics

August 1st, 2017

Department of Physics
Concordia University
7141 Sherbrooke Street West
Montreal, QC H4B 1R6

Dr. Paul Joyce
Associate Dean, Academic Programs
Faculty of Arts and Science

Subject: Support for a new MSc/MASc in Nanoscience and Nanotechnology

Dear Dr. Joyce and FCC members,

The Department of Physics, in collaboration with the Dept. of Chemistry and Biochemistry in the FAS and three ENCS Departments (ECE, MIE, BCEE), is proposing the creation of a new MSc/MASc thesis-based program in Nanoscience and Nanotechnology.

The proposal is self-explanatory and describes the many benefits of a program where Masters students would be exposed to both fundamental science and engineering aspects of Nanoscience and Nanotechnology. This program would formally require all student to have research co-supervisors in each of the two Faculties (FAS and ENCS), and promote research ties across the two Faculties. It would give an edge to graduates to acquire marketable skills, and/or to pursue further studies in either nanoscience or nanotechnology.

In terms of course offerings by the Department, there are no resource implications beyond what is stated in the proposal's budget (course section for NANO 610). The course PHYS 636 is already offered yearly by the Department and has the necessary spare seating capacity. The course PHYS 679 will be offered every alternate year using the current course allocation of the Department.

Our Department has discussed this proposal on many occasions over 2016-17. The proposal was approved by the Departmental Curriculum Committee in February 2017, and the latest version was approved again by the whole Department today on May 26th 2017. We are very enthusiastic about this proposal, the improved and unique training opportunities it will bring our students as well as the synergy it will create across five Departments involved in nanomaterial research. Thank you for your consideration, and please do not hesitate to contact us if additional information is needed.

Yours sincerely,

Alexandre Champagne
Chair

Valter Zazubovits
Curriculum Committee Chair

UNIVERSITÉ Concordia UNIVERSITY

FACULTY OF ENGINEERING AND COMPUTER SCIENCE

Department of Electrical and Computer Engineering

INTERNAL MEMORANDUM

DATE: September 5, 2017

TO: Dr. M. Debbabi, Associate Dean, Research and Graduate Studies, Faculty of Engineering and Computer Science

FROM: Dr. A. Bagchi, Chair, Department of Building, Civil and Environmental Engineering
Dr. W.E. Lynch, Chair, Department of Electrical and Computer Engineering
Dr. M. Pugh, Chair, Department of Mechanical, Industrial and Aerospace Engineering

SUBJECT: Proposal for a New Program: MSc/MASc Nanoscience and Nanotechnology

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Dear Dr. Debbabi,

Please find attached a proposal for a new cross-department, cross-faculty thesis master's program in Nanoscience and Nanotechnology (NSNT).

This program is being jointly proposed by five departments namely, the Department of Building, Civil and Environmental Engineering (BCEE), the Department of Electrical and Computer Engineering (ECE), the Department of Mechanical, Industrial and Aerospace Engineering (MIAE), the Department of Chemistry and Biochemistry and the Department of Physics.

The proposal was passed at the departments' respective council meetings on the following dates:
-Department of Building, Civil and Environmental Engineering: March 21, 2017
-Department of Electrical and Computer Engineering: March 3, 2017
-Department of Mechanical, Industrial and Aerospace Engineering: February 17, 2017
-Department of Chemistry and Biochemistry: March 6, 2017
-Department of Physics: May 26, 2017

In the future, other departments may join this program; for example, the Department of Chemical and Materials Engineering, the Department of Biology, etc.

This program is expected to complement and enhance our current programs, foster inter-faculty collaborations and contribute to a major initiative at the University in materials science and engineering.

We would be grateful if you could put this on the agenda of the next Graduate Studies committee.

1455 De Maisonneuve Blvd. W., EV 5.139, Montreal, Quebec, Canada H3G 1M8
Tel. 514-848-2424 ext. 3100 Fax 514-848-2802 ece.concordia.ca

Concordia University

Faculty of Arts and Science
and
Faculty of Engineering and Computer Science

Departments of
Chemistry and Biochemistry,
Physics,
Building, Civil and Environmental Engineering,
Electrical and Computer Engineering,
Mechanical, Industrial and Aerospace Engineering

MSc and MASc in Nanoscience and Nanotechnology

October 12, 2017

1 TABLE OF CONTENTS

EXECUTIVE SUMMARY

The MSc/MASc in Nanoscience and Nanotechnology will be among one of the first cross-faculty joint programs at Concordia University. It is designed as an elite graduate program to train students with the interdisciplinary skills and knowledge needed to work in nanoscience and nanotechnology (NSNT). NSNT is broadly defined as the science and technological capabilities which arise when scaling down materials and devices to the nanometer scale. In these very small materials, the traditional understanding of material physics, chemistry and engineering breaks down, changing the rules of how energy is used and stored in devices. Research and development in NSNT span from the fundamental physical science of materials, to biological and environmental implications, to technology development and device engineering. A few examples of NSNT include quantum materials, nanoconstructs for medical applications, nanoengineering of chemistry, nanomechanical systems, smart thin-films and biological circuits. Because no single traditional research field has the expertise to address all of these training needs, it is essential to develop a new hybrid Faculty of Arts and Science and Engineering and Computer Science (FAS/ENCS) program to teach students the broad range of theories and hands-on skills needed to work productively and creatively in nanoscience and nanotechnology.

A key component of this proposal is to attract new graduate students to Concordia with a focused program and to foster new and exciting collaborations within the University. The program targets students with the aptitude to take on a cutting edge and highly interdisciplinary field via cross-discipline research and training and the program goals have been structured accordingly. All students must be co-supervised with one supervisor from ENCS and one from FAS, and all students will be trained in interdisciplinary skills via a six credit core course, specifically designed for this program which provides each cohort with the skills of working in interdisciplinary teams while building knowledge and foundations in both nanoscience and nanotechnology. This will facilitate the cross-Faculty training and research (that would be difficult via traditional programs housed in individual departments), attracting a very specific set of students to Concordia.

The goal of this program is to train competent researchers in NSNT by providing them with a high level of academic training, strong track record in research (thesis and publications) as well as with marketable skills (ability to work on applied projects and in multidisciplinary teams). The need for such uniquely trained workers in Quebec is made most evident by the recent creation of PRIMA Quebec, an ecosystem focused on the "development of advanced materials for the benefit of research centres, companies and Quebec society", and which is financed by the Government of Quebec (MEIE). It regroups over 100 organizations based in Quebec (ranging from large multi-national companies to start-ups and research centres). The primary goal of the proposed Master's in NSNT is precisely to train students in the field of "advanced materials". We aim for the proposed Master's in NSNT to (i) supply highly qualified personnel (HQP) to the PRIMA ecosystem (and other similar ecosystems in Canada and abroad), and (ii) to develop a strong research connection between the FAS/ENCS and PRIMA Quebec, MITACS and the industrial NSERC programs. After a slow start in the early 2000s, the NSNT industrial base and HQP need in Quebec/Canada is now strong and growing rapidly. Thus, it is timely and urgent to position Concordia as a leader of NSNT training in Quebec before another institution fills this rapidly growing need.

1. PROGRAM IDENTIFICATION

1.1 Program title, degree title and level

The joint MSc/MASc program will be entitled Master of/Magisteriate in Science (Nanoscience and Nanotechnology) for FAS students and Master of/Magisteriate in Applied Science (Nanoscience and Nanotechnology) for ENCS students, to be offered at the graduate level.

1.2 Areas of specialization

The area of specialization is Nanoscience and Nanotechnology (NSNT). The program focuses on training and research at the boundary between science and engineering, i.e., training engineers and scientists with the foundational knowledge and practical skills to work in multi-disciplinary teams tackling major challenges in the development of nanoscale devices and materials. Eligible theses must involve co-supervision from the two faculties, the Faculty of Arts and Science (FAS) and the Faculty of Engineering and Computer Science (ENCS), and involve nanoscale research in either the science or engineering aspect; thus the program specifically targets projects that span these two disciplines rather than projects that would normally be carried out in one or the other and provides the training needed for graduates to work in multidisciplinary teams.

1.3 Administrative location (the administrative unit to which the program will belong: Department and Faculty, University)

The program is an inter-faculty and inter-departmental program and is equally administered by the Departments of *Chemistry and Biochemistry*, *Physics*, *Building, Civil and Environmental Engineering*, *Electrical and Computer Engineering* and *Mechanical, Industrial and Aerospace Engineering* at Concordia University. Students may enrol in the program via applications to any one of the five home departments.

In the future, other departments may join this program; for example, the Department of Chemical and Materials Engineering, the Department of Biology, etc.

2 PROGRAM OBJECTIVES

2.1 Theoretical foundation and general academic aims

This program is designed as an elite graduate program to train students with the interdisciplinary skills and knowledge needed to work in nanoscience and nanotechnology (NSNT). NSNT is broadly defined as the science and technological capabilities which arise when scaling down materials and devices to the nanometer scale. In these very small materials, the traditional understanding of material physics, chemistry and engineering breaks down, changing the rules of

how energy is used and stored in devices. Research and development in NSNT spans from the fundamental physical science of materials, to biological and environmental implications, to technology development and device engineering. A few examples of NSNT include quantum materials, nanoconstructs for medical applications, nanoengineering of materials, nanomechanical systems, smart thin-films and biological circuits. Because no single traditional research field has the expertise to address all of these training needs, it is essential to develop a new hybrid (FAS/ENCS) program to teach students the broad range of theories and hands-on skills needed to work productively and creatively in nanoscience and nanotechnology.

In nanomaterials, quantum effects (e.g., wave properties of electrons and atoms, discretization of the energy of particles) become dominant and heavily modify their physics, chemistry and engineering when compared to traditional bulk materials. Parameters such as conductivity, melting points, crystalline structures, surface effects, sensitivity, and even the colour of materials change as their sizes reach the nanometer scale. The new science and engineering possibilities of nanomaterials can lead to spectacular applications such as better solar cells, green chemistry, and new types of transistors. The successful development of new technologies using nanomaterials by engineers requires collaborations with scientists for the rational design of said materials. Similarly, the scaling of devices to the nanoscale requires the development of new materials with optimal heat transfer, electronic and optical properties. Moreover, the applications developed by engineers generate ideas and devices which can lead to important scientific breakthroughs, studies, and theoretical developments.

The goal of this program is to train competent researchers in NSNT by providing them with a strong base of advanced knowledge and experience in the field of nanoscience and nanotechnology. This training will include academic courses, experiential learning in advanced laboratory techniques, research training and professional skills specific to working on applied projects and in multidisciplinary teams.

2.2 Specific knowledge, expertise, skills (learning outcomes) which students will acquire

The program aims to provide interdisciplinary training in the current state of research in both nanoscience and nanotechnology. Thus, the pedagogical goals of this program are to (i) give primarily *via* coursework the engineering students a solid understanding of nanoscience and the science students a solid understanding of nanotechnology and to enable problem solving via the collaboration of these disciplines and (ii) primarily *via* a research thesis engage the students into high profile interdisciplinary research projects where they can become full-fledged NSNT researchers while retaining their primary specialization.

The specific program objectives are:

- To ensure all students have a solid foundation in physical science and engineering principles to understand advanced topics in nanoscience and nanotechnology;
- To provide specific training in selected advanced topics in nanoscience and nanotechnology;
- To provide hands-on, practical training in current science and technology methodologies that can be applied to nanoscale materials and devices;

- To generate HQP with the communication skills and knowledge base required to interact in an interdisciplinary environment in industry or academia to professional standards;
- To train HQP for a research-oriented career in an interdisciplinary and collaborative field.

The learning outcomes associated with each of these objectives are outlined in the curriculum map provided in section 4.2.6.

3 RATIONALE FOR PROGRAM PROPOSAL

3.1 Socio-economic or cultural relevance

Nanoscience and Nanotechnology (NSNT) refer to a broad set of theoretical models, fabrication procedures and measurement instruments which make use of nanometer-scale materials (materials with at least one dimension below 100 nm). NSNT has already dramatically transformed our lives, and is poised to continue enhancing many scientific and technological fields such as electronics, optics, telecommunications, medicine, pollution control, material science and clean energy production and storage. To give only a few representative examples, NSNT has permitted to: fabricate electrical circuits at the 10-nm scale to make portable electronic devices (cell phones, tablets, laptop), dramatically improve telecommunications (storage, processing and transmission of information), develop microfluidic systems to screen and analyse new drug candidates for the pharmaceutical industry, improve the efficiency of solar cells, develop new light-weight and wear resistant materials for transport (for example, in the aerospace or electric vehicle sectors), develop new nanoprobes and nanocarriers for medical imaging and drug delivery and industrial applications.

Advanced technologies and manufacturing are increasingly important in Quebec's economy. NSNT Research and Development and training of highly qualified personnel (HQP) are of crucial importance for Quebec's industries to remain competitive and create new expertise.

3.1.1 Detailed needs analysis, including projected student enrolment: Enrolment chart, including graduation and attrition, with justifications and explanations (projected for a five-year period)

It is clear from the strong demand in our current MSc and MASc programs at Concordia which are connected to NSNT that students are highly interested in nanoscience and nanotechnology. There are several reasons why a student would choose to register in the proposed NSNT program rather than other Master's programs at Concordia or elsewhere. We believe that (i) this program will be highly attractive to BEng graduates who wish to profit from a fundamental science approach to underlying nano concepts at the graduate level. It will provide them with a smooth transition to include more science in their training and give them a distinctive set of skills in preparation for entering PhD programs. Such students will value the extensive supervision provided by both Principal Investigators in ENCS and FAS, and the possibility of building their skills towards a research career. (ii) This program will fill a gap in the program offerings for BSc graduates who want to complement their science training with a more applied training

(engineering), while making full use of their scientific knowledge and interests. This degree will offer them the option of entering the job market straight after an MSc and additionally broaden the range of PhD programs available to them. We note that Concordia has very large student enrolments at the BSc and BEng levels in the five departments involved in the proposed NSNT program. This pool of students combined with students from other institutions will be sufficient to populate the proposed NSNT Master's program.

As shown in the enrolment chart appended, we expect the number of in-program MSc and MASc students to rise from 10 in the first year of operation to 20, 22, 24 and 26 in years 2, 3, 4 and 5 of the program. We anticipate growth of the program over time with expansion of the integrated Nano research team across ENCS and FAS, and also on the continued successful recruitment of many high calibre students. Because the program will be focused on a small number of academically talented students, and provide individualized training (two thesis co-supervisors), we expect a very low attrition rate of approximately 2 students per year. The graduation time for students should vary from 6 to 7 semesters depending on the rapidity at which the students complete their thesis research. We thus expect the number of graduates in each of the first five years of the program to be around 0, 8, 10, 11 and 12.

3.1.2 An analysis of the evolution of training requirements in the field in Quebec and future employment opportunities

The need for such uniquely trained workers in Quebec is made most evident by the recent creation of PRIMA Quebec, an ecosystem focused on the "development of advanced materials for the benefit of research centres, companies and Quebec society", and which is financed by the Government of Quebec (MEIE). It regroups over 100 organizations based in Quebec (ranging from large multi-national companies to start-ups and research centres). The primary goal of the proposed Master's in NSNT is precisely to train students in the field of "advanced materials". We aim for the proposed Master's in NSNT to (i) supply highly qualified personnel (HQP) to the PRIMA ecosystem* (and other similar ecosystems in Canada and abroad), and (ii) to develop a strong research connection between the Faculties of Arts and Science and Engineering and Computer Science at Concordia, PRIMA Quebec, MITACS and the industrial NSERC programs. After a slow start in the early 2000s, the NSNT industrial base and HQP need in Quebec/Canada is now strong and growing rapidly. Thus, it is timely and urgent to position Quebec as a leader of NSNT training before other provinces fill this rapidly growing need for research and reap related jobs and investments. We emphasize that the proposed program provides especially sound training for the NSNT sector as it rests primarily on a research thesis training which is very flexible (individualized) and will naturally adapt itself to the rapidly evolving Nanoscience and Nanotechnology fields.

*See Appendix 1

3.1.3 Identification of the main prospects for graduates from the program (employment, self-employment, creativity opportunities, career mobility, advanced education)

The early days of nanoscience and nanotechnology research (in the 2000s) were mostly focused on fundamental research with little connection to industry. In recent years, the number of major companies making substantial investments in NSNT in Quebec/Canada has increased rapidly (e.g., IBM Canada, BASF Canada, GE Canada, JV Domtar/FPI, Pratt and Whitney Canada, Teledyne-Dalsa, Tekna Advanced Materials); and many small companies which are extremely active in research are emerging in Quebec (e.g., NanoXplore, Photon etc., Raymor, and many others are part of PRIMA).

Aside from nano-focused companies, because NSNT is an enabling technology that will spur advances and new products throughout the economy, many existing companies must capitalize on these advances or face increasing competition. Industries where the impact will be large and of particular interest in Quebec include the aerospace, biomedical and energy sectors. An emerging area of increasing importance is lab-on-chip and (bio) chemical sensors.

Nanomaterials offer improvements in both the mechanical properties of aircraft structure (strength/weight improvements, good vibration characteristics, etc.) as well as durability in harsh environments, e.g., inside jet engines. Quebec's aerospace companies are working to realize the potential of these new technologies. Concordia has great strength in this area and has had many fruitful research collaborations with local aerospace companies in particular through Le Consortium de recherche et d'innovation en aerospatiale du Québec (CRIAQ). Among Concordia's leaders in this field are: Dr. S. V. Hoa – nanocomposites, Dr. R. Drew – metal foam and materials, Dr. C. Moreau – thermal sprays.

The business model in the pharmaceutical industry has undergone a paradigm shift. Quebec has emerged as the Canadian leader in this new partnership model with consortia such as the Personalized Medicine Partnership for Cancer (PMPC), the Quebec Consortium for Drug Discovery (CQDM) and the NEOMED institute. These consortia span basic research, manufacturing, biotechnology and medical technology, resulting in a high demand for a research-trained workforce. Within the biomedical sector, nanomaterials are poised to have a major impact, and Quebec's recognized expertise in oncology, neuroscience, cardiology and genomics is reflected at Concordia with leaders in multimodal nanoparticles for bio imaging, disease detection, drug delivery and opto genetics (Dr. J. Capobianco, Dr. R. Naccache, Dr. J. Oh, Dr. C. DeWolf, Dr. P. Shizgal, Dr. V. Martin).

One of Quebec's greatest strengths is its electric energy industry. While traditionally this has been centred around hydro-electricity and led by Hydro Quebec, there is great potential for leadership in other forms of energy generation (improved solar cells, thin films that generate solar energy), and energy consumption (new battery technology for electric vehicles, etc). To this end, a few years ago the provincial government established Innov-EE for innovation in the power field. For Quebec to achieve leadership in the electric energy industry it must take advantage of nanotechnology's promise. Concordia is well positioned to innovate and collaborate with industry in achieving this. There is a long history of collaborating with local industry on leading edge

research, with such experts as Dr. P. Pillay – renewable energy and machines, and Dr. A. Athienitis – solar energy.

Lab-on-chip technology creates the possibility to carry out reactions and experiments on a silicon chip. This offers advantages in terms of portability, immediate use in distant or dirty environments, automation of lab work, etc. Concordia is particularly strong in this area with experts like Dr. M. Packirsamy and Dr. S. Shih.

In these and other industries, no one discipline will be able to address the challenges of developing marketable nanotechnologies and realizing the full application potential of nanomaterials. This has led to a strong job market for students trained in NSNT, that is, engineers and scientists with the training to work in interdisciplinary teams.

The rapid creation of NSNT companies is directly correlated with the recent focus of Canada's funding agencies on applied research. The 2015 NSERC Strategic Partnership Grant target areas have a huge overlap with nanomaterials and the NSNT field. For instance, three of the five topics in the Advanced Manufacturing target area include: Lightweight Materials and Technologies, Nanotechnologies, and Quantum Materials. There are many other references to NSNT in the other target areas. We find that there is a strong demand in Quebec and Canada for graduates with a Master's in NSNT. For instance, recently a CFREF grant of $33M titled "From Quantum Science to Quantum Technologies" was awarded to University de Sherbrooke and will further support the development of the NSNT industry in Quebec.

The job market for NSNT is also especially rich in small companies (start-ups) whose number is rapidly expanding due to the recent creation of several incubators, for instance, in University settings (District3 at Concordia, CENTECH at ETS, Espace-INC at U. de Sherbrooke, etc.). These incubators (especially District3) will permit the in-program students to familiarize themselves with start-ups in the NSNT sector, and also develop their familiarity with entrepreneurship career possibilities. We expect that the unique training offered by the proposed NSNT program at the interface of Engineering and Science will permit graduates to either join an ongoing start-up or create their own. In addition, the GradProSkills program offers workshops in professionalization that will enhance students' career preparation before graduation. Finally, we expect an important portion (about 30 to 50%) of the proposed NSNT masters' program students to continue their studies at the PhD level. Because students will have unique applied science and engineering skills, we believe that they will create a new source of elite PhD candidates for applied research in Canada. These PhD candidates are needed in Quebec, especially given the fact that there are many funding opportunities for PhD candidates in Engineering and Applied Science compared to the limited pool of talented and properly trained applicants.

The strength of the North American job market in NSNT is made clear by the estimate of the National Science Foundation that this sector would provide 1 million jobs in the U.S. in 2015, and that the market value of NSNT products would reach $1 trillion by 2020 (source: http://www.nnin.org/).

3.1.4 Importance of the sector affected by the proposed program to professional orders, private or public organizations, or government departments

The proposed program will provide highly qualified personnel in NSNT to the professional orders of Engineers, and the government agencies which evaluate, purchase and legislate nanoscience and nanotechnologies.

3.1.5 Existence of similar programs in Canada or elsewhere, their academic success; similarities and differences with the proposed program; how will the proposed program help bring the Province of Quebec up to par with the Canadian or International level; or how will the new program help the Province become a leader in this area of specialization.

The only similar Master's program in Canada is offered by the University of Waterloo, Ontario. Their program is similar and focuses on thesis-based research at the interface of Science and Engineering with a focus on NSNT. There is however one significant difference with our proposed program: we would require co-supervision of all program students by one faculty member in Science and one in Engineering. This would ensure full benefits of the program to all students. We note that the University of Waterloo program is successful and supports the effervescent technology-based industrial activities in the Waterloo region. Recently, the region of Montreal has been making progress in developing a similar high-tech industry, and the proposed NSNT Master's at Concordia would supply properly trained personnel to this ecosystem.

There are many similar programs in the U.S. (an exhaustive list of U.S. graduate programs in Nanotechnology can be found at http://www.nano.gov/education-training/university-college) and elsewhere (UK, Europe, Singapore). The countries and states where these programs are found are typically leaders of the NSNT fields. The implementation of the proposed NSNT MSc/MASc program aims to strengthen Quebec's position as a world-class player in the NSNT fields by supporting its efforts to attract and retain qualified students and employers.

3.2 Systemic relevance

3.2.1 Existence of similar programs in the Quebec university system, their enrolments; complementarity of this proposed program with other similar programs including those at college level; specific contribution of proposed program within the Quebec context; how it compares to existing programs

According to our research, there are no existing Master's degrees in Nanoscience or Nanotechnology in the province of Quebec. McGill University, however, does offer a Minor in Nanotechnology at the Bachelor level through their Department of Chemical Engineering. Furthermore, University of Sherbrooke offers their Master of Chemistry students the possibility to choose an option entitled, "Cheminement en nanomatriaux et caractérisation de pointe".

3.2.2 Foreseeable links to related programs; potential collaborations between professors in the new program and related ones in other institutions

We foresee a good relationship with the Waterloo MSc/MASc programs in NSNT, and hope to host joint student conferences, as well as career development and networking events for students. Such interactions between the Concordia and Waterloo programs would be a good occasion to significantly strengthen the Quebec-Ontario NSNT partnerships in research and teaching. There are several NSNT research interests and expertise overlaps between the faculty members at both institutions.

While there are no other NSNT Master's programs in Quebec, there are graduate programs with overlapping research in NSNT (in Physics, Chemistry, Electrical and Mechanical Engineering, etc.) at several institutions in Montreal and across Quebec. The NSNT Concordia faculty members are already partnering with many institutions in their research activities. We expect that these active collaborations will strengthen, and that new ones will emerge from the proposed program.

i. Active collaborations

Department of Chemistry and Biochemistry	
Faculty Name	**Active Collaborators**
John Capobianco	M.A. Fortin, Université Laval G. Solé, Universidad Autonoma de Madrid M. Frigoli, Université de Versaille S. Melle, Complutense University of Madrid V. Mahalingam, Indian Institute of Science Education and Research Z. Pikramenou, University of Birmingham B. Viana, Chimie Paris tech – CNRS P. Dorebos, Delft University of Technology T. Vogt, Catholic University Leuven M. Hartman, Virgina Commonwealth University
Faculty Name	**Active Collaborators**
Christine DeWolf	A. Badia, Université de Montréal M. A. Brook, McMaster University H. Eichorn, University of Windsor P. Wood-Adams, Concordia University P. Forgione, Concordia University J. A. Capobianco, Concordia University

Faculty Name	Active Collaborators
Rafik Naccache	P. Forgione, Concordia University A. Piekny Concordia University R. Hoge, McGill University D. Rudko, McGill University N. Tufenkji, McGill University D. Christodoulides, College of Optics and Photonics at the University of Central Florida M. Khajavikhan, College of Optics and Photonics at the University of Central Florida F. Omenetto, Tufts University R. Morandotti, Institut National de la Recherche Scientifique - Centre EMT, Canada F. Vetrone, Institut National de la Recherche Scientifique - Centre EMT, Canada D. Jaque, Universidad Autónoma de Madrid, Spain J. García Solé, Universidad Autónoma de Madrid, Spain
Faculty Name	**Active Collaborators**
John Oh	C. Wilds, Concordia University D. Vuckovic, Concordia University P. Forgione, Concordia University C. Brett, Concordia University A. Piekny, Concordia University M. Sacher, Concordia University M. Fortin, Université Laval G. Laroche, Université Laval D. Ma, INRS S. Sun, INRS X. Wang, Institute of Medicinal Plant Development (IMPLAD), China T. Govender, University of Kwazhulu-Natal, South Africa
Faculty Name	**Active Collaborators**
Gilles Peslherbe	O. Khavryunchenko, Advanced Technologies Research Institute, Slovak University of Technology in Bratislava, Slovakia A. English, Concordia University H. Vach, Laboratoire de Physique des Interfaces et Couches Minces, Centre National de la Recherche Scientifique, École Polytechnique, Palaiseau, France H. Muchall, Concordia University G. Dolgonos, University of Graz, Austria

Department of Physics	
Faculty Name	**Active Collaborators**
Pablo Bianucci	J. A. Capobianco, Concordia University Y-A Peter, École Polytechnique de Montréal
Faculty Name	**Active Collaborators**
Alexandre Champagne	O. Moutannabir, École Polytechnique de Montréal B. Reulet, Université de Sherbrooke V. Zazubovits, Concordia University
Faculty Name	**Active Collaborators**
Panagiotis Vasilopoulos	F. M. Peeters, University of Antwerp, Belgium X. F. Wang, University of Suzhou, China M. Tahir, College of Science, University of Hafar Al Batin, Kingdom of Saudi Arabia P. Krstajic, IHTM, University of Belgrade, Serbia
Faculty Name	**Active Collaborators**
Truong Vo-Van	A. Haché, Université de Moncton N.N. Dinh, Vietnam National University R. Izquierdo, UQAM, ETS R. Bruning, Mount Allison University M. Packirisamy, Concordia University M. Kahrizi, Concordia University
Faculty Name	**Active Collaborators**
Valter Zazubovits	A. Champagne, Concordia University L. Kalman, Concordia University T. Vo-Van, Concordia University R. Jankowiak, KSU R. Picorel, Zaragoza P. Fromme, ASU W. Johnson, Susquehanna University, Pennsylvania

Department of Building, Civil and Environmental Engineering	
Faculty Name	**Active Collaborators**
Catherine Mulligan	L. Yerushalmi, BIOCAST D. Walsh, Concordia University S. Barrington, Consumaj S. Rahaman, Concordia University S. Li, Concordia University Titan Environmental Containment H2O Innovation Hydro Quebec Concordia Institute of Water, Energy and Sustainable Systems (CIWESS)
Faculty Name	**Active Collaborators**
Saifur Rahaman	N. Tufenkji, McGill University S. Chang, University of Guelph J. Oh, Concordia University C. Mulligan, Concordia University GE Water & Process Technologies, Oakville, Ontario Labatt Brewing Company, Lasalle Bio-Terre Systems, Sherbrooke PLT Environnement Inc., Quebec City

Department of Electrical and Computer Engineering	
Faculty Name	**Active Collaborators**
M. Zahangir Kabir	Analogic Canada, Montreal K. S. Karim, Waterloo University S. Kasap, University of Saskatchewan J. A. Rowlands, University of Toronto P. Valizadeh, Concordia University
Faculty Name	**Active Collaborators**
Mojtaba Kahrizi	T. Vo-Van, Concordia University K. Khorasani, Concordia University K. Khorasani, Concordia University Intempco Controls Ltd., Montreal QPS Photonics, Montreal Member of "Center for Applied Synthetic Biology" (CABS) Member of Technical Committee of MEMS & Nanotechnology Society; organizing workshops and special session in international conferences like IECON, ISIE.

Faculty Name	Active Collaborators
Steve Shih	D. Kwan, Concordia University V. Martin, Concordia University J. Keasling, University of California, Berkeley A. Mukhopadhyay, Lawrence Berkeley National Labs T. Northen, Lawrence Berkeley National Labs
Faculty Name	**Active Collaborators**
Pouya Valizadeh	None
Faculty Name	**Active Collaborators**
John Zhang	NRC, Ottawa O/E Land Inc., Montreal OZ Optics Inc. Ottawa

Department of Mechanical, Industrial and Aerospace Engineering	
Faculty Name	**Active Collaborators**
Robin Drew	P. Wood-Adams, Concordia University M. Pugh, Concordia University Rio Tinto UNAM and UMich, Mexico
Faculty Name	**Active Collaborators**
Mamoun Medraj	AMTC-NRC IMI-NRC MTL-CANMET GM Air Liquide Rolls Royce PWC Metal Improvement Co. Alstom
Faculty Name	**Active Collaborators**
Sivakumar Narayanswamy	J. Wang, University of New South Wales, Australia S. Williamson, Ontario Institute of Technology M. Packirisamy, Concordia University I. Stiharu, Concordia University R. Wuthrich, Concordia University

Faculty Name	Active Collaborators
Muthu Packirisamy	R. Bhat, Concordia University J. Dargahi, Concordia University N. Sivakumar, Concordia University S. Rakheja, Concordia University P. Pillay, Concordia University W. Sheldon, Concordia University T. Vo-Van, Concordia University V. Zazuvitz, Concordia University A. Piekney, Concordia University M. Whitway, Concordia University D. Chatterjee, Indian Institute of Technology, Madras, India R Rengaswamy, Indian Institute of Technology, Madras, India P.Radhakrishnan, Institute of Advanced Studies, PSG Tech, India N. Umapathy, Instrumentation Engineering National Institute of Technology, Tiruchirapalli, India P Juneau, UQAM A. Geitmann, Université de Montréal and McGill University D. Maxwell, Western University M. Bhat, McGill University and Univerity of Toronto N. Sonnenberg, McGill University A. Gosh, Atlantic Cancer Research Institute, Moncton P. Broderick, New York State University S. Kumar College of Pharmacy, NGP Institute of Technology A. Das, BITS, India SciMed Lab, Edmonton Enablence Inc., Ottawa IMRS Inc., Winnipeg Mobecomm Inc., Montreal Aeponyx, Montreal Sensing Dynamics, Montreal

3.3 Institutional relevance

3.3.1 Status of the discipline at Concordia; how the proposed program fits into the overall set of programs offered by the university (including undergraduate programs); in the same field, related fields, sector of education concerned; enrolment trends and graduates in related programs; impact of enrolments in related fields within the University

Concordia has significant strengths in both Nanoscience (Faculty of Arts and Science, FAS) and Nanotechnology (Faculty of Engineering and Computer Science, ENCS). While the work in the FAS (Chemistry and Biochemistry; Physics) is mostly focused on fundamental research, the work in the ENCS (Electrical and Computer Engineering; Mechanical, Industrial and Aerospace Engineering; Building, Civil and Environmental Engineering) is applied. Both the FAS and ENCS offer Bachelor's, Master's and PhD programs in each of the mentioned departments. The goal of the proposed NSNT program is to create a new synergy and training approach by bridging the fundamental (FAS) and applied (ENCS) research in NSNT at Concordia. This unique interdisciplinary training (with co-supervisors from each Faculty for each student) will bring new ideas and creativity from science to the applied research in the ENCS, and empower the FAS research by connecting it to applications and employers. The extent and intensity of these fundamental-to-applied NSNT connections will be new to Concordia, and to the best of our knowledge, unique in Quebec.

This flagship program in NSNT will create a new group of highly employable and versatile HQPs in NSNT with skills in both science and engineering. We expect that these graduates will be highly valuable to companies in Quebec and also promote the growth of the nano industry via the creation of start-up companies. The resulting strengthening of the job market in NSNT and high-profile research publications are expected to raise the profile of Concordia and Quebec in NSNT. This would help grow the enrolments of all NSNT and STEM related programs at Concordia. In recent years, there has been a steady but gradual growth in nano-related programs at Concordia. We expect this growth to significantly accelerate due to the visibility of the proposed Master's program.

3.3.2 **Research and development performance of the university in the field of study of the proposed program where advanced degrees are concerned. Research grants obtained and sources of funding**

Department of Chemistry and Biochemistry							
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
John Capobianco	30,000	30,000	30,000	30,000	30,000	30,000	Concordia University Senior Research Chair
						60,960	FRQNT Team
						37,464	FRQNT Equipment
		45,000	45,000	45,000	45,000	45,000	NSERC Discovery
				13,500			Concordia University (Seed Funding, Accelerator Team, ARRE, Facilities optimization)
			50,000	50,000	50,000		Ministère de L'Agriculture, des Peches et de L'Alimentation, Québec
	15,000	20,000					Centre Québecois Materiaux Fonctionnels project grant
	46,279						NSERC Equipment (RTI)
		583,000	583,000	583,000	583,000	583,000	Centre Québécois des Materiaux Fonctionnelles, FQRNT Regroupement Stratégiques (Co-PI)
Total	**45,000**	**724,279**	**708,000**	**721,500**	**708,000**	**756,424**	**3,663,203**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Christine DeWolf	20,250	20,250	20,250	20,250	20,250	20,250	FQRNT plus matching funds from Concordia University
	25,000	25,000	25,000	25,000	34,400	34,400	NSERC Discovery
					28,500	28,500	FQRNT Projet de recherche en équipe (Co-PI)
			8,000	11,850			Concordia University (Seed Funding, Accelerator Team, ARRE, Facilities optimization)
Total	**45,250**	**45,250**	**45,250**	**52,000**	**83,150**	**83,150**	**354,050**

Faculty Name	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Funding Agencies
Rafik Naccache ***(hired 12/2015)***						20,000	Concordia University – Strategic Hire in Nanomedicinal Chemistry
						67,500	Concordia University – Start-up Funds
Total						**87,500**	**87,500**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
John Oh ***(hired 07/ 2010)***			8,340	7,499		2,4800	Concordia University (Seed Funding, Accelerator Team, ARRE, Facilities optimization)
				10,000	10,000	10,000	CFI Infrastructure Operating Fund (IOF)
			10,000	10,000		10,000	Centre Québecois Materiaux Fonctionnels project grant (PI)
					100,000	100,000	Korea Research Institute of Chemical Technology (KRICT)
					2,200		NSERC Interaction Grant
				55,500	55,500		Korean Ministry of Knowledge Economy
		49,620	49,620				PPG Korea
		45,000	45,000	45,000	45,000	45,000	NSERC Tier II Canada Research Chair
		28,000	28,000	28,000	28,000	28,000	NSERC Discovery Grant
		36,000					FRQNT Etablissement de Nouveaux Chercheurs (equipment)
		20,000	20,000				FRQNT Etablissement de Nouveaux Chercheurs
		300,000					CFI Leaders Opportunity Funds (equipment)
	100,000						Concordia University Capital Equipment Start-up Funds
	15,000						Concordia University Faculty Research Development Funds
Total	**115,000**	**478,620**	**160,960**	**155,999**	**240,700**	**217,800**	**1,369,079**

Faculty Name	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Funding Agencies
Gilles Peslherbe	3,000						Ministère de l'Education du Québec (MEQ), Bourse d'Excellence pour un Séjour Scientifique
	250,000						Canada Foundation for Innovation (CFI) and partners, Equipment Grant
	23,490						Fonds Québécois de la Recherche sur la Nature et les Technologies, Team Grant
	65,000	65,000	65,000	54,000	54,000	54,000	NSERC Discovery
			6,375				Concordia University (Seed Funding, Accelerator Team, ARRE, Facilities optimization)
	25,000	25,000	25,000				Concordia University Research Chair (Junior)
			88,620	290,156	224,420	217525	Compute Canada
			7,500	7,500			Conseil Franco-Québecois de coopération universitaire
		3,600	3,600	3,600	3,600	6,500	Fonds Québécois de la Recherche sur la Nature et les Technologies
					5,000		Concordia University, Research Award for Established Researcher in the Technology, Industry and Environment cluster
						25,000	Environment Canada
Total	**366,490**	**93,600**	**196,095**	**355,256**	**287,020**	**303,025**	**1,601,486**

Department of Physics							
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Pablo Bianucci ***(hired 07/2012)***				26,000	26,000	26,000	NSERC Discovery
						25,000	NSERC ENGAGE
				56,682	20,000		FRQNT Establishment of new university researchers
						30,000	NSERC RTI (Co-PI)
						10,500	NSERC RTI (Co-PI)

					2,000		CMC
					3,150		CMC
					1,049		CMC
				18,251			Concordia University Facilities Optimization Program
				6,750			Concordia University Team Seed Grant (Co-PI)
					9,375	8,946	Centre d'Optique, photonique, et Laser (COPL)
Total				**107,683**	**61,574**	**100,446**	**269,703**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Alexandre Champagne					799,340		Canadian Foundation for Innovation (CFI) and partners (Co-PI)
						15,000	Concordia University Research Grant for Chair, FAS
					48,000	48,000	NSERC Discovery
					129,989		NSERC Research tools and instruments
					148,989		NSERC Research tools and instruments (Co-PI)
			15,000	15,000	15,000	15,000	Concordia University Research Chair Tier II
			6,375				Concordia Seed Funding (Team Leader)
		5,000	5,000	5,000			NSERC Discovery grant supplement for Early Career Researchers
		5,000					Concordia University Research Award (Emerging)
		10,374					NSERC Research tools and instruments (Co-PI)
	18,192						Concordia University Vice-President facility optimization program
	10,000						Petro-Canada Young Investigator Award
	182,767						Ministère de l'Éducation, des Loisirs et du Sport du Québec (MELS)

	182,767						Canadian Foundation for Innovation (CFI) Leaders Opportunity Fund
	91,383						Concordia University and partner (equipment supplier)
	53,000	53,000	53,000	53,000			NSERC Discovery
	20,000						FQRNT Établissement de nouveaux chercheurs
Total	**558,109**	**73,374**	**79375**	**73000**	**1,141,318**	**78,000**	**2,003,176**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Panagiotis Vasilopoulos	30,529	30,529	30,529	18,000	18,000	18,000	NSERC Discovery Grant
Total	**30,529**	**30,529**	**30,529**	**18,000**	**18,000**	**18,000**	**145,587**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Truong Vo-Van					22,000	22,000	NSERC Discovery
						25,000	NSERC Engage Plus
						25,000	NSERC Engage
					15,000		MITACS
				15,000			MITACS
			15,000				MITACS
		25,000					NSERC Engage
	22,378						NSERC Discovery
	20,000	20,000	20,000	20,000			Condensed Matters Research, Grant for Chair, FAS – Concordia
Total	**42,378**	**45,000**	**35,000**	**35,000**	**37,000**	**72,000**	**266,378**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Valter Zazubovits						7,000	Concordia OVPRGS Individual Seed Grant
	30,000	30,000	30,000	30,000	30,000	20,000	NSERC Discovery (individual)
	~1,500	~1,500	~1,500	~10,000			Operational grant related to CFI-LOF project
			12,750				Concordia University VPRGS team grant (Co-PI)
	13,500						Concordia University VPRGS + Arts and Science
Total	**~45,000**	**~31,500**	**~44,250**	**~40,000**	**30,000**	**27,000**	**217,750**

Department of Building, Civil and Environmental Engineering							
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Catherine Mulligan						30,000	Mitacs Accelerate
					33,000	33,000	NSERC-CRD, Collaborative Research and Development Grant – Project (CRDPJ)
					23,500		NSERC Engage Plus
					80,000		Mitacs cluster
					15,000		Mitacs Accelerate
				15,000			Mitacs Accelerate
				15,000			Mitacs Accelerate
				25,000			NSERC Engage
				4,185			NSERC Interaction grant
			145,500	299,800	299,800	299,800	NSERC CREATE
			2,000				MDEIE SIIRI
			2,681				MDEIE SIIRI
		211,915					MDEIE Infrastructure (PSRV2)
		24,000					NSERC Engage
		10,000					MRI-Vietnam-Québec
	80,000	80,000	80,000				FQRNT Effet de serre
	42,000	42,000	42,000	42,000	42,000	42,000	NSERC Discovery grant
	40,000	40,000	40,000				NSERC Accelerator Supplement
	33,200						MAPAQ
Total	**195,200**	**407,915**	**312,181**	**400,985**	**493,300**	**404,800**	**2,214,381**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Saifur Rahaman ***(hired 06/2012)***						47,341	Quebec-Ontario Cooperation for Agri-Food Research (Co-PI)
				22,000	22,000	22,000	NSERC Discovery
						25,000	NSERC Engage
					20,000	20,000	FRQNT- New Researchers Start-up
					21,786	21,786	FRQNT Equipment
						25,000	NSERC Engage
				25,000			NSERC Engage
						5,000	Petro Canada Young Innovator Award

						7,000	Seed Funding (Individual)
						20,000	ENCS Capital Research Innovation Fund (Co-PI)
					15,420	15,420	Facility Optimization
				19,878			Facility Optimization
				13,500			Seed Funding (Team)
			25,000	25,000			Start-up
Total			**25,000**	**105,378**	**77,206**	**186,547**	**418,131**

Department of Electrical and Computer Engineering							
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
M. Zahangir Kabir					25,000	25,000	NSERC Discovery Grant
	22,000	22,000					NSERC Discovery Grant
	20,000						FQRNT-NATEQ Noveaux Chercheurs
					4,000		Concordia University Seed Grant (Co-PI)
				6,300			Concordia University Seed Grant
Total	**42,000**	**22,000**		**6,300**	**29,000**	**25,000**	**124,300**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Mojtaba Kahrizi					25,000	25,000	NSERC Discovery Grant (PI)
	26,750	26,750	26,750	26,750			NSERC Discovery Grant (PI)
				13,500			Concordia University, Seed Funding (PI)
				25,000			NSERC Engage Grant (PI)
					14,000	14,000	Mitacs-NSERC (PI)
Total	**26,750**	**26,750**	**26,750**	**65,250**	**39,000**	**39,000**	**223,500**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Steve Shih ***(hired 01/2016)***						50,000	Concordia University Start-up grant
						120,000	Concordia University Equipment grant
						45,000	Concordia University Office of the VP Research
Total						**215,000**	**215,000**

Faculty Name	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Funding Agencies
Pouya Valizadeh						22,000	NSERC Discovery Grant (PI)
						150,000	NSERC Research Tools and Instruments (Co-PI)
	20,000	20,000	20,000	20,000	20,000		NSERC Discovery Grant (PI)
Total	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**172,000**	**272,000**

Faculty Name	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Funding Agencies
John Zhang						25,000	NSERC Engage project
					60,000		NSERC Collaborative research and development (CRD) project
					28,500	28,500	FQRNT Research team project
					8,400	8,400	NSERC Discovery
					149,900		NSERC RTI Project
			15,000				Quebec-Shandong Province Collaboration Project
		24,000	24,000				FQRNT Team Research Project
		30,000					CIPI TEN project
	150,000						NSERC Research Tools and Instruments (RTI)
	5,800	5,800	5,800	5,800			NSERC Individual Discovery Grant
Total	**155,800**	**59,800**	**44,800**	**5,800**	**246,800**	**61,900**	**574,900**

Department of Mechanical, Industrial and Aerospace Engineering							
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Robin Drew						50,000	NSERC Engage & Engage Plus
	30,000	30,000	30,000	30,000	30,000		NSERC Discovery
Total	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**	**50,000**	**200,000**

Faculty Name	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Funding Agencies
Mamoun Medraj						242,265	Masdar Institute – operational
						350,000	Masdar Institute – equipment

						140,000	Emirates Steel Industries and UAE Ministry of Energy
	22,140	22,140	22,140	25,000	25,000		NSERC Discovery (Grant ended due to leave)
				130,920	187,630		NSERC and GM – CRD (Grant ended due to leave)
			60,000	61,000			Alstom – Switzerland
			529,000				MDEIE-Infrastructure (Co-PI)
		71,700	70,900	70,900			Fonds de recherche du Québec - Nature et technologies (Co-PI)
	24,750	20,000	25,000	25,000	25,000		NSERC – AUTO21
		25,500	27,435				NSERC – H2CAN
		261,660	288,168	253,038	201,286		NSERC, CRIAQ, Turbomeca and PWC – CRD (Co-PI)
		25,650	25,650				NSERC – MagNET
	25,000						NSERC and Air Liquide – Engage
		353,250	318,250	235,000			NSERC, CRIAQ, NanoQuébec, Rolls Royce and PATT Technologies – CRD
	350,309	160,942	142,000				NSERC and GM – CRD (Co-PI)
Total	**422,199**	**940,842**	**1,508,543**	**800,858**	**438,916**	**732,265**	**4,843,623**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Sivakumar Narayanswamy			20,000	20,000	20,000	20,000	Discovery Grant
	11,000	11,000	11,000	11,000	11,000	11,000	SRT
	7,000						Concordia Seed Funding Individual
						35,000	Concordia Infrastructure optimization
Total	**18,000**	**11,000**	**31,000**	**31,000**	**31,000**	**66,000**	**188,000**
Faculty Name	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**Funding Agencies**
Muthu Packirisamy						25,000	NSERC Engage Grant
					40,000	40,000	NSERC Accelerator

				50,000	50,000	NSERC Discovery
			114,000			MITACS Elevate
			25,000			NSERC Engage Grant
		25,000				NSERC Engage Grant
		20,000				NDRF, India
		10,000				Foreign Affairs and International Trade Canada (DFAIT) Canadian Commonwealth Scholarship
		10,000				Foreign Affairs and International Trade Canada (DFAIT) Canadian Commonwealth Scholarship
		10,000				Foreign Affairs and International Trade Canada (DFAIT) Canadian Commonwealth Scholarship
40,000						CIPI TEN grant
	10,000					Foreign Affairs and International Trade Canada (DFAIT), Canadian Commonwealth Scholarship
10,000						Foreign Affairs and International Trade Canada (DFAIT), Canadian Commonwealth Scholarship
300,000						MDEIE Grant for commercialization
18,000	18,000	18,000				NSERC Discovery Grant
					75,000	RTI from NSERC
				219,000	219,000	New Brunswick Innovation Fund
			41,000	41,000	41,000	FQRNT Team
	25,000	25,000	25,000			FQRNT Team

				23,750			FQRNT Team Equipment
	36,250						NSERC Research Tools and Instruments (RTI)
	29,150	29,150					FQRNT Team
						35,000	Graduate Student Support Program (GSSP)
					22,000		Graduate Student Support Program (GSSP)
				30,000			Graduate Student Support Program (GSSP)
			8,333				SEED Accelerator
					42,500		Facility Optimization Grant
					35,000	35,000	Concordia University Research Chair
		25,000	25,000	25,000	25,000	25,000	Concordia University Research Chair
				6,300			Individual Seed Grant
			20,000				Graduate Student Support Program (GSSP)
		38,125					Graduate Student Support Program (GSSP)
	17,000						Graduate Student Support Program (GSSP)
Total	**450,400**	**145,275**	**171,333**	**290,050**	**474,500**	**545,000**	**2,076,558**

3.3.3 How does the proposed program align with the Faculty's and University's academic plans

Solving large scale multi-prong research problems or developing competitive industrial solutions requires the collaboration of engineers and scientists. This program prepares students for this environment. Moreover, NSNT employers require individuals trained to work in multidisciplinary teams that can take ideas from fundamentals through to applications and device fabrication. Graduates of this program will have been trained to work in such teams with a focus on the boundary between materials science and engineering. Both FAS and ENCS have strengths in 'nano' and together provide a critical mass which can be leveraged for external funding for research, infrastructure and training. We aim for a small-scale program, carefully targeted, and following a structure similar to an NSERC CREATE program**.** The proposed program falls directly

within the Technology, Industry and the Environment cluster in the 2013-2018 Concordia Strategic Research Plan. It is an interfaculty/interdisciplinary program rich in experiential learning opportunities, and is very well aligned with many of the University's Strategic Directions (***Double Your Research, Mix it Up***, ***Teach for Tomorrow, Grow Smartly*****).**

4 PROGRAM DESCRIPTION AND REQUIREMENTS

4.1 Admission Procedure

Students apply to this program through one of the participating departments. Applicants will first be considered by the Nanoscience and Nanotechnology Admission Committee (comprised of two representatives from each Faculty, distributed across the participating departments). Should the applicant be accepted into the MSc/MASc Nanoscience and Nanotechnology program, an offer of admission will originate from the home department, and the home department will provide administrative support to the student.

4.1.1 General and specific admission requirements

The program is open to full-time students only; due to the intensive core course training, only September entry will be permitted initially (until such a time as growth permits a second section of this course to be offered). The following bachelor's degrees with high academic standing will be eligible: bachelor's degree in science disciplines with a major in physics, chemistry, biochemistry or related disciplines; bachelor's degree in any of the engineering disciplines. To be considered for admission to Master-level studies, the applicant must have a bachelor's/baccalaureate degree (or equivalent) with high standing (e.g., with honours, or the Concordia equivalent of a GPA of at least 3.00 on a scale of 4.30). Applicants will be required to provide two letters of recommendation with the Academic Assessment form and a short statement of purpose.

Language Proficiency Requirements: A student whose primary language is not English must write a pre-admission proficiency test. Test results must be reported directly to the Admissions Application Centre by the test centre. Results more than two years old will not be accepted as proof of language proficiency.

Proof of proficiency in English must be provided by achieving the appropriate score on one of the following:

- **Test of English as a Foreign Language (TOEFL)**
  The minimum acceptable score for the internet-based TOEFL (TOEFL iBT) is 90 and no part under 20 (for the Faculty of Engineering and Computer Science 85 and no part under 20).
- **International English Language Testing System (IELTS)**
  The minimum band score for IELTS is 6.5 and no part under 6.5.

Please note: individual programs may require a higher minimum score.

4.1.2 Requirements for the degree

1. *Residence:* In accordance with standard university policy, the minimum residence requirement for this master's degree is three terms of full-time study. This requirement must be met regardless of the amount of graduate work previously completed in any other program or at any other university.

2. *Credits:* Fully-qualified candidates are required to complete a minimum of 45 credits including a 33-credit research thesis.

Academic requirements

Credit Load: The normal course load for full-time students is 11.25 credits in each of first four terms.

Program and Course Withdrawal: Students who wish to apply for withdrawal from the program must do so in writing at the office of the graduate program director. Students may drop a course up to the end of the course change period. This is normally about two weeks after classes begin (see Academic Calendar). In addition to the regulations which appear in the Graduate Registration section of the Graduate Calendar, students enrolled in the program will be required to observe the following rules.

Academic Standing: The academic progress of graduate students is monitored at the end of every term. To be considered in good standing, students must maintain an Assessment Grade Point Average (AGPA) of at least 3.00 based on a minimum of 12 credits. Students whose AGPA falls below 3.00 are considered to be on academic probation. Students whose AGPA falls below 3.00 for any two assessment periods are considered to be in failed standing. Students in qualifying programs or concurrent qualifying programs in undergraduate courses will be assigned a grade in accordance with the undergraduate grading system for undergraduate courses. For all courses a B grade is required in order to ensure that the minimum standards of the graduate grading system are maintained. In addition, students must meet specific program requirements for good academic standing.

C Rule: Graduate students who receive more than one C grade during the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the Dean of Graduate Studies. Students who have been withdrawn may apply for re-admission (see Re-Admission of Withdrawn Students in Graduate Admission section). Students who receive another C after re-admission will be withdrawn from the program and will not be considered for re-admission. Students should refer to the section on Academic Standing in their program's calendar entry.

F Rule: Graduate students who receive a failing grade in the course of their studies will be withdrawn from the program unless continuation in the program is requested by the student's program or Faculty and approved by the Dean of Graduate Studies. If withdrawn from program, students may apply for re-admission (see Re-Admission of Withdrawn Students). Students who receive another failing grade after re-admission will be withdrawn from the program and will not

be considered for re-admission.

GPA Graduation Requirement: In order to graduate, students in doctoral and master's programs must have a cumulative GPA of at least 3.00.

Research Progress: Each student shall have a thesis advisory committee comprising both supervisors and one additional faculty member from each Faculty. The student shall meet with the advisory committee at intervals defined by their home department's master's program. The advisory committee shall note any deficiencies and make recommendations for improvement. If improvement is not noted at the next meeting, the committee can recommend removal from the program.

Time Limit. All work for the master's program for full-time students is expected to be completed within six terms (two years) from the time of initial registration in the program at Concordia University. All work for a master's/magisteriate degree for full-time students must be completed within 9 terms (3 years) from the time of initial registration in the program.

4.2 Academic activity

4.2.1 Degree requirements

The program is designed as a thesis-based research master's program. Students who enrol through ENCS will be awarded a MASc in NSNT while those who enrol through FAS will be awarded an MSc in NSNT. The program is comprised of 45 credits, of which 33 credits are the thesis and 12 credits derive from coursework.

4.2.2 Program schedule; Core and elective courses

Students must complete a minimum of 12 credits of courses, including:

i) the intensive core course (NANO 610, 6 credits) to be taken in the first term after entry

ii) two 600-level elective courses selected from the Nanoscience course list and the Nanotechnology course list given below (at least one of these should be taken in the second term). Note that **one** of these may be replaced with an appropriate 600-level course from the student's home department with the approval of the thesis advisory committee.

The intensive core course NANO 610 will be co-taught by at least one instructor from each of the two participating faculties and will be closed to students from other programs. However, the following elective courses will be cross-listed with courses from the home departments, thereby permitting students from other programs to register. The core NANO 610 course should serve as an alternative prerequisite for the elective courses.

NANO 600-Level Electives (3 credits each)		
Nanoscience courses		
Course	**Course number(s)**	**Credits**
Nanochemistry	CHEM 651	3
Selected Topics in Applied Physics *(when topic is appropriate)*	PHYS 679	3
Condensed Matter Physics I	PHYS 636	3
Nanomaterial Characterization *(new course submitted for approval)*	CHEM 652	3
Nanotechnology courses		
Course	**Course number(s)**	**Credits**
VLSI Process Technology	ELEC 6241	4
Principles of Solid State Nanodevices	ELEC 6281	4
Environmental Nanotechnology	CIVI 6681	4
Engineering Metrology and Measurement Systems	MECH 6491	4

4.2.3 Number of credits per term to allow students to meet program objectives; timeline to completion

The normal residency time for this degree will be six terms. The proposed schedule and course sequence is as follows.

YEAR 1		
FALL	**WINTER**	**SUMMER**
• Common core course, NANO 610 • Research	• Research • 1-2 advanced level elective(s) including NANO 600-level elective	• Research • 0-1 advanced level elective including NANO 600-level elective
YEAR 2		
FALL	**WINTER**	**SUMMER**
• Research • 0-1 advanced level elective including NANO 600-level elective	• Research • 0-1 advanced level elective including NANO 600-level elective	• Research • write and submit thesis

4.2.4 Thesis or Research proposal (link between research/thesis interests and teaching activities should be apparent)

Each student will complete a master's level thesis in their home department. In accordance with the program goals, the thesis must be completed under the co-supervision of two participating faculty members, with one supervisor from ENCS and one from FAS.

In all cases the supervisor in the student's home faculty will serve as the main supervisor (PI) and the co-supervisor will be from the other Faculty. Each student will have a thesis advisory committee comprised of the two supervisors plus one member from each Faculty. The advisory committee will be responsible for the assessment of the student's academic progress in conjunction with the home department, as noted above.

4.2.5 Proposed course descriptions

Core course

NANO 610 Principles of Nanoscience and Nanotechnology (6 credits)
Prerequisite: Enrolment in the MSc or MASc in Nanoscience and Nanotechnology.
This course introduces all students in the MSc/MASc Nanoscience and Nanotechnology program to the core science and engineering principles required for working at the boundary between these two nano-disciplines. It serves to ensure all students have a solid theoretical foundation in physical science and engineering principles to understand advanced topics in nanoscience and/or nanotechnology. It comprises four modules (two science-based and two engineering-based). Case studies complement lectures and provide students with a cross-section of backgrounds, disciplines and training. Emphasis is placed on collaborative work, learning to communicate across boundaries, directed learning and literature survey techniques. Course modules can include, but are not limited to chemical and physical properties of materials at the nanoscale, synthesis of nanomaterials and nanostructures, nanomaterials characterization, introduction to quantum physics of nanomaterials, current limitations in nanoscience, interaction of biological systems with nanomaterials, toxicity and environmental risks of nanomaterials, environmental implications of engineered nanomaterials, nanomanufacturing, and nanotechnology at the food-energy-water nexus.

Nanoscience elective courses

CHEM 651 Nanochemistry (3 credits)
Prerequisites: CHEM 217, 218, 221, 222, 234, 235, 241, or equivalent.
This modular course covers the areas of production, characterization and applications of nanoscale structures and materials. Each module is taught by a different professor as well as guest lecturers. Topics may include (but are not limited to) size dependent properties, synthesis of organic and inorganic nanostructures, self-assembled structures, chemical patterning and functional nanopatterns, biomaterials. Nanometer scale fabrication techniques such as lithographic methods, nanostamping and patterned self-assembly are discussed. Modern analysis techniques such as atomic force microscopy and electron microscopy, which are used to map and measure at the single molecule level, are introduced. Applications such as photonics, optical properties, biodetection and biosensors, micro- and nano-fluidics, nanoelectronics and nanomachines are presented. The

course includes a term project carried out using the nanoscience facilities held in the Department research labs.

PHYS 636 Condensed matter physics I (3 credits)
Review of electron levels in periodic potentials, various band-structure methods, Thomas-Fermi and Hartree-Fock theories, screening, anharmonic effects crystals, inhomogeneous semiconductors, p-n junctions, transistors. Dielectric properties of insulators, ferroelectric materials. Defects in crystals. Magnetic ordering, paramagnetism, diamagnetism, ferromagnetism, phase transitions, superconductivity.

CHEM 652 Nanomaterials Characterization (3 credits)
Prerequisite: 30 credits of CHEM courses including CHEM 293 or 335; or NANO 610.
This course covers state-of-the-art nanomaterials physical characterization techniques including but not limited to: dynamic light scattering, transmission and scanning electronic microscopies (size and morphology), X-ray powder and electron diffraction (crystallinity and phase identification), Fourier transform/attenuated total reflectance infrared, Raman and X-ray photoelectron spectroscopies (surface chemical state and chemical composition), differential scanning calorimetry and thermogravimetric analysis (polymorphism, moisture content and weight loss), Brunauer–Emmett–Teller analysis (surface area), nuclear magnetic resonance (chemical bonding and nuclei interactions). Content is delivered through lectures only and laboratory demonstrations.

PHYS 679 Selected Topics in Applied Physics: Optical properties of nanomaterials (3 credits)
Introduction to optical properties of semiconductors (luminescence) and metal (plasmon) nanostructures, growth/synthesis of optically active nanomaterials, optical characterization techniques (spectroscopy: PL, PLE, CW and time-resolved, TC-SPC, cathodoluminescence). Applications to be covered include lasers, sensors, drug delivery, localized thermal treatments.

Nanotechnology elective courses
ELEC 6241 VLSI Process Technology (4 credits)
Introduction to basic VLSI technologies; crystal growth, thermal oxidation, diffusion, ion implantation, chemical vapour deposition, wet and dry etching, and lithography. Layout, yield, and VLSI process integration. The lab demonstrates a semiconductor device fabrication process. A project is required.

ELEC 6281 Principles of Solid State Nanodevices (4 Credits)
Prerequisite: ELEC 6271 or equivalent.
Theoretical basis of nanodevices. Overview of fundamental quantum phenomena in semiconductors. Electronics in low-dimensional structures (two-dimensional electron gas, quantum wire and dots, electron scattering, transport). High-speed electron devices based on quantum structures (nanoscale MOSFETs, high-electron-mobility transistors, resonant-tunneling diodes and transistors, superlattice-based transistors). Logic gates based on quantum devices. Quantum optoelectronics (optical transitions in quantum structures, quantum well, quantum dots photodetectors and lasers, quantum cascade lasers). Single electron devices. Carbon nanotube transistors, molecular electronics and spintronics. Nanodevice technology and characterization. A project is required.

Note: Students who have received credit for ELEC 691X (Principles of Solid State Nanodevices) may not take this course for credit.

CIVI 6681 Environmental Nanotechnology (4 credits)
Topics include basic concepts of nanoscience and nanotechnology; characterization of nanomaterials; nanoscience and public policy aspects; nanoparticle transport and fate in the environment; nanohazard assessment and nanotoxicology; environmental engineering applications of nanotechnology: pollutants sensing, monitoring, control and remediation. A project is required.

MECH 6491 Engineering Metrology and Measurement Systems (4 credits)
Introduction to metrology, linear and geometric tolerancing, non-optical and optical methods in form measurement, fundamentals of optical metrology, interferometry - theory and overview, Moiré and phase shifting interfereometry, speckle interferometry and holography, light sources, detectors and imaging systems. Applications to precision measurement, Doppler vibrometry and dynamic characterization, applications to MEMS (Micro-Electro-Mechanical Systems), and special topics include: nanometrology, X-ray interferometry and interference spectroscopy. A project is required.

4.2.6 Curriculum Map: relationship of the program components to the learning outcomes

See tables below.

Program Component Added-value program objectives for working at the nanoscience and nanotechnology boundary (H = high contribution, M = moderate contribution, R = reinforced contribution)	CORE COURSE	ELECTIVES	THESIS
ACQUISITION OF KNOWLEDGE **Program Objective: To provide interdisciplinary training in the current state of research in both nanoscience and nanotechnology**			
1. To ensure all students have a focused preparation and competence in the physical science and engineering principles to understand advanced topics in nanoscience and nanotechnology and to pursue interdisciplinary research (core course)			
Student Learning Outcomes: by the end of the program the student should have			
Acquired an understanding of the science and engineering principles underlying nanoscience and nanotechnology research such that they can contribute to interdisciplinary research	H	R	R
Developed an appreciation of the challenges, methodologies, risks and applications encountered in different nanoscience and nanotechnology disciplines	H	R	R
Gained the knowledge necessary to integrate the two fields (nanoscience and nanotechnology) to maximize innovation in applied science and engineering research	H	R	R

2. To provide specific training in selected advanced topics in nanoscience and nanotechnology (electives)			
Student Learning Outcomes: by the end of the program the student should have			
Acquired a depth of knowledge and expertise in a specific discipline of nanoscience and/or nanotechnology		H	H
Gained mastery of multiple advanced level topics in nanoscience and/or nanotechnology		H	H
TECHNICAL EXPERTISE **Program objective: to provide hands-on, practical training in the current methodologies**			
Student Learning Outcomes by the end of the program the student should be able to			
Select appropriate methodologies to solve a scientific or technological research problem		M	H
Operate advanced nanotechnology instrumentation	M		H
Carry out synthesis or fabrication of nanomaterials and devices			H
Recognize limitations of current methodologies	M	M	H
PROFESSIONAL SKILLS **Program objective: to generate HQP capable of interacting in an interdisciplinary environment in industry or academia to professional standards**			
Student Learning Outcomes: by the end of the program the student should be able to			
Communicate (using appropriate oral and written terminology) basic and advanced science and technology principles to a wide variety of audiences (including experts and the public)	M	M	H
Work within a multidisciplinary group of scientists and engineers towards a common, interdisciplinary goal	H	H	H
Exhibit ethical behaviour in communication, collection and reporting findings	H	H	H
Abide by accepted standards of professional practice			H
Demonstrate time-management and organization skills	M	M	H

RESEARCH SKILLS AND EXPERIENCE **Program objective: to train HQP for a research-oriented career in an interdisciplinary and collaborative field**			
Student Learning Outcomes: by the end of the program the student should be able to			
Critically asses the literature from multiple disciplines	M	M	H
Formulate a research-driven question which spans the boundaries of nanoscience and nanotechnology			H
Develop an appropriate approach to address the research question			H
Critically analyze and interpret experimental data in the context of multiple disciplines	M	M	H
Synthesize, support and defend conclusions	M	M	H

4.2.7 **Intellectual atmosphere (conferences, symposia)**

Each of the participating departments hosts an annual seminar series with invited external speakers who are experts in their fields. These are open to all faculty and students. The Department of Chemistry and Biochemistry hosts an annual Graduate Student Conference which spans all subdisciplines, including a section dedicated to nanochemistry. It is anticipated that most students would take part in this event. Graduate students are eligible for annual travel funding (up to $1500) enabling them to attend relevant regional, national and international conferences. Many faculty members participate in relevant Quebec régroupements stratégiques (e.g. Centre for self-assembled structures, CSACS, Centre québécois sur les matériaux fonctionnels, CQMF, régroupement québécois sur les matériaux de pointe, RQMP) that provide a rich forum of training and meeting opportunities including workshops, symposia, speakers, visiting scientists. In the sciences, faculty members have just submitted an industrial stream NSERC CREATE grant application on nanomedicinal chemistry that would directly support this program through student support, training workshops and internships.

5 RESOURCE IMPLICATIONS OF THE PROGRAM

5.1 Faculty Resources (Qualifications and scholarly output)

5.1.1 Qualifications of individual professors: degrees, experience, summary of faculty achievements (previous five years) including:

i) Publications in peer-reviewed journals

Department of Chemistry and Biochemistry							
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
John Capobianco	7	4	8	3	7	3	32
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Christine DeWolf	1	0	3	1	1	2	8
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Rafik Naccache	3	3	6	3	4	3	22
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
John Oh	7	6	8	15	9	7	52
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Gilles Peslherbe	5	5	4	4	6	4	28

Department of Physics							
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Pablo Bianucci	3	4	1	1	0	1	10
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Alexandre Champagne	1	1	1	1	1	1	6
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Panagiotis Vasilopoulos	6	2	1	12	6	5	32
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**

Truong Vo-Van	8	7	5	7	3	4	34
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Valter Zazubovits	6	4	0	3	4	2	19

Department of Electrical and Computer Engineering							
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
M. Zahangir Kabir	5	1	3	6	3	5	23
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Mojtaba Kahrizi	0	3	4	1	1	1	10
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Steve Shih	2	1	1	2	2	3	11
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Pouya Valizadeh	3	1	2	3	1	2	12
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
John Zhang	11	11	5	2	4	6	39

Department of Building, Civil and Environmental Engineering							
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Catherine Mulligan	4	3	5	3	5	8	28
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Saifur Rahaman	2	1	0	3	5	5	16

Department of Mechanical, Industrial and Aerospace Engineering							
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Robin Drew	3	3	0	6	2	1	15
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Mamoun Medraj	6	8	13	24	8	14	73
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Sivakumar Narayanswamy	1	4	1	1	2	2	11
Faculty Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Muthu Packirisamy	8	18	21	8	14	5	74

ii) Experience acquired supervising masters' and doctoral students and post-doctoral fellows, participation on thesis juries

Department of Chemistry and Biochemistry		
Faculty Name	**Student (Degree)**	**Year**
John Capobianco	N. Bogdan (PDF)	2016
	D. Cooper (PDF)	2016
	S. Mal (PDF)	2016
	D. C. Rodriguez Burbano (Ph.D.)	2016
	Q. Ying Li (M.Sc.)	2015
	Q. Yu (M.Sc.)	2014
	B. Zhang (M.Sc.) (FQRNT scholarship)	2013
	E. Martin Rodriguez (PDF)	2012
	R. Naccache (Ph.D.) (NSERC Alexander Graham Bell Scholarship)	2012
	F. Vetrone (Ph.D.)	2010
	F. Mangiarini (Ph.D.)	2011
	P. A. Rojas Gutierrez (Ph.D.)	In progress
	C. Thompson (Ph.D.) Co-supervisor: Dr. P. Bianucci	In progress
	D. Bekah (Visiting PhD)	In progress
	T. Sabri (Ph.D.)	In progress

Faculty Name	Student (Degree)	Year
Christine DeWolf	S. Eini (Ph.D.) Co-supervisor: Dr. A. Badia	In progress
	S. Behyan (PDF) Co-supervisor: Dr. A. Badia	In progress
	O. Borozenko, (PDF) (FQRNT fellowship) Co-supervisor: Dr. A. Badia	In progress
	A. Khan (M.Sc.) Co-supervisor: Dr. A. Badia	In progress
	H. Youssef (Ph.D.)	In progress
	R. Miclette Lamarche (Ph.D.)	In progress
	E. Wrobel (Visiting Ph.D.)	2016
	S. Selladurai (M.Sc.)	2015
	E. Mansuri (M.Sc.) Co-supervisor: Dr. M.A. Brook	2015
	A. Rajasingham (M.Sc.) Co-supervisor: Dr. P. Forgione	2014
	N. Subramanianm (M.A.Sc.) Co-supervsior: Dr. P. Wood-Adams	2014
	V. Balhara (Ph.D.)	2014
	A. Bakr (Ph.D.)	Left the program, 2013
	J. Conway (M.Sc.)	2010
	F. Safinejad (PDF) Co-supervisor Dr. H. Muchall	2010
	D. Correia Ledo (Ph.D.) Co-supervisor: Dr. J. Mauzeroll	2010
	S. Eini (Ph.D.) Co-supervisor: Dr. A. Badia	In progress
	S. Behyan (PDF) Co-supervisor: Dr. A. Badia	In progress
Faculty Name	**Student (Degree)**	**Year**
Rafik Naccache	H. Breitenborn (Ph.D.) Co-supervised student at INRS-EMT	In progress
	F. Noun (M.Sc.)	In progress
	J. R. Macairan (M.Sc.)	In progress
Faculty Name	**Student (Degree)**	**Year**
John Oh	K.K. Bawa (Ph.D.)	In progress
	A.M. Jazani (M.Sc.)	In progress
	B. Singh Metneja (Ph.D.)	In progress
	S.W. Hong (M.Sc.)	In progress

	S. Jung (PDF)	In progress
	S.Y. An (M.Sc.)	2016
	D. Arunbabu (PDF)	2015
	N.R. Ko (Ph.D.)	2015
	P. Li (M.Sc.)	2015
	T. Sun (PDF)	2015
	Y. Wen (M.Sc.)	2015
	A. Cunningham (M.Sc.)	2014
	S. Aleksanian (M.Sc.)	2014
	N. Chan (PDF)	2013
	B. Khorsand (M.Sc.)	2013
	Q. Zhang (PDF)	2012
Faculty Name	**Student (Degree)**	**Year**
Gilles Peslherbe	P. Archambault (Ph.D.) Co-supervisor: Dr.H.M.Muchall	In progress
	V. Parmar (Ph.D.) Co-supervisor: Dr. A.M. English	In progress
	O. Wosu (M.Sc.)	In progress
	X.Wang (Ph.D.)	2016
	A. Bhattacharjee (PDF)	2015
	C. Chi Mak (PDF)	2015
	A. Noce (Ph.D.) Co-supervisor: Dr. T. Koreshkova	2015
	C.Chi Mak (Ph.D.)	2014
	M. Shadrina (PDF)	2014
	S. Jahangiri (Ph.D.)	2014
	S. Jahangiri (Ph.D.)	2013
	S. Mehrpajouh (M.Sc.) Co-supervisor: Dr. HM. Muchall	2012
	P. Varadwaj (PDF) (PBEEE Quebec Merit Scholarship Fellow)	2012
	L. Zhang (Ph.D.) Co-supervisor Dr. H.M. Muchall	2012
	A. Foisy-Geoffroy (M.Sc.)	2010
	S. Mushrif (PDF)	2010

Department of Physics		
Faculty Name	**Student (Degree)**	**Year**
Pablo Bianucci	A. Hassanpour (Ph.D.)	In progress (2017 expected)
	T. Hamidfar (Ph.D.)	In progress
	K. McGarvey-Lechable (Ph.D.)	In progress
	C. Thompson (Ph.D.) Co-supervisor: Dr. J. A. Capobianco	In progress
	H. Ghali (PDF)	2016
	K. McGarvey-Lechable (M.Sc.)	2015
	T. Hamidfar (M.Sc.)	2015
Faculty Name	**Student (Degree)**	**Year**
Alexandre Champagne	M. Collette (Ph.D.) Co-supervisor: Dr. O. Moutanabbir	In progress
	H. Griffin (M.Sc.)	In progress
	A. McRae (Ph.D.) (NSERC)	In progress
	G. Melin (M.Sc.)	In progress
	M. Storms (M.Sc.)	In progress
	M. Zoghi (M.Sc.)	In progress
	J. Porter(M.Sc.)	2015
	S. Yigen (Ph.D.)	2015
	V. Tayari (Ph.D.)	2014
	A. McRae (M.Sc.) (NSERC)	2013
	Y. Liu (PDF)	2012
	J. Island (M.Sc.)	2011
	S.Yigen (M.Sc.)	2010
Faculty Name	**Student (Degree)**	**Year**
Panagiotis Vasilopoulos	M. Bahrami (Ph.D.)	In progress
	M. Tahir (PDF)	2015
	V. Vargiamidis (PDF)	2014
	P.M. Krstajic (PDF)	2010
Faculty Name	**Student (Degree)**	**Year**
Truong Vo-Van	P. Jittiarporn (Visiting Ph.D.)	In progress
	T. Vinh Son (Ph.D.) Co-supervisor: Dr. Alain Haché	In progress
	T. Thi Thao (Ph.D.) Co-supervisor: Prof. Nguyen Nang Dinh	In progress
	S. Stoenescu (PDF)	2016
	A. Almoabadi (M.Sc.)	2015

	N. Herascu (RA)	2015
	M. Alsawafta (PDF)	2014
	B. Diop (PDF)	2014
	Y. Mosaddeghian (M.Sc.)	2014
	S. Stoenescu (Ph.D.) Co-supervisor: Dr. M. Packirisamy	2014
	N. EtebariAlambari (M.Sc.) Co-supervisor: Dr. R. Izquierdo (UQAM)	2013
	A. Mahmoud (Ph.D.) Co-supervisor: Dr. R. Izquierdo	2013
	M. Alsawafta (Ph.D.) Co-supervisor: Dr. S.K. Misra	2012
	H. Gao (PDF)	2012
	J. K. Baral (PDF)	2011
	M. Wahbeh (M.Sc.) Co-supervisor: Dr. S.K. Misra	2011
Faculty Name	**Student (Degree)**	**Year**
Valter Zazubovits	D. Modafferi (M.Sc.) Co-supervisor: Dr. L. Kalman	In progress
	A. Levenberg (M.Sc.)	In progress
	G. Melin (M.Sc.) Co-supervisor: Dr. A. Champagne	In progress
	G. Shafiei (M.Sc.)	2016
	M. Shahparnia (M.Sc.) Co-supervisor: Dr. M. Packirisami	2011
	N. Herascu (Ph.D.)	2013
	S-M Najafi-Shooshtari (Ph.D.)	2013
	Y. Liu (PDF) Co-Supervisor: Dr. A. Champagne.	2012
	S. Ahmouda (M.Sc.)	2010
	N. Herascu (M.Sc.)	2010
	H. Mehenni (PDF)	2010
	X. Zhao (M.Sc.)	2010

Department of Building, Civil and Environmental Engineering		
Faculty Name	**Student (Degree)**	**Year**
Catherine Mulligan	C. J. Alves Dos Santos (M.A.Sc.)	In progress
	F. Arab (Ph.D.)	In progress
	M. Farshidy (Ph.D.)	In progress
	B. Hamzé (M.A.Sc.)	In progress
	S. Hazeri (M.A.Sc.)	In progress

M. Phuong (M.A.Sc.)	In progress
M. Poirier (M.A.Sc.)	In progress
N. Saborimanesh (PDF)	In progress
D. Veetil (RA)	In progress
M. Pourabadehei (Ph.D.)	2017
F. Y. Babaee (Ph.D.) Co-supervisor: Dr. S. Rahaman	2016
N. Curry (PDF)	2016
E. A. Garravand (Ph.D.)	2016
B. Mohammadhosseinpour (M.A.Sc.)	2016
A. N. N. Nasser (Ph.D.) Co-supervisor: Dr. S. Li	2016
S. J. Roshtkhari (Ph.D.)	2016
N. Saborimanesh (Ph.D.)	2016
S. Sarma (M.A.Sc.)	2016
S. Suminathan (RA)	2016
D. Veetil (PDF)	2016
N. Abedi (Ph.D.) Co-supervisor: Dr. L. Yerushalmi	2015
R. Chowdhury (Ph.D.)	2015
M. Madani Hosseini (Ph.D.) Co-supervisor: Dr. S. Barrington	2015
A. Chalise (M.A.Sc.)	2014
X.J. Jiang (M.A.Sc.) Co-supervisor Dr. L. Yerushalmi	2013
H. Kazemi (M.A.Sc.) Co-supervisor Dr. L. Yerushalmi	2013
M. Sharifi-Nistanak (M.A.Sc.)	2013
E. Abbasi-Garravand (M.A.Sc.)	2012
N. Afroze (M.A.Sc.) Co-supervisor Dr. L. Yerushalmi	2011
A. Alavi (M.A.Sc.)	2011
F. Behzadian (M.A.Sc.) Co-supervised with L. Yerushalmi	2010
S. Deghazarian (M.A.Sc.)	2010
A. Hamidi (M.A.Sc.)	2010
R.A. Karim (M.A.Sc.)	2010
A. Moghaddam (M.A.Sc.)	2010
T. N. Ramalingaiah (M.A.Sc.)	2010
Z. M. Ridha (M.A.Sc.)	2010

Faculty Name	Student (Degree)	Year
Saifur Rahaman	S. Adhikary (M.A.Sc.) Co-Supervisor: Dr. Ramamurthy	In progress
	E. Alebrahim (M.A.Sc.) Co-Supervisor: Drs. Moreau and Dolatabadi	In progress
	N. Anwar (Ph.D.)	In progress
	T. Chen (Ph.D.)	In progress
	Md. S. Islam (Ph.D.)	In progress
	W. Ma (Ph.D.)	In progress
	E. Mousavi (M.A.Sc.)	In progress
	S. Nanni (Visiting M.A.Sc. student) Co-Supervisor: Dr. Tiraferri, Politecnico di Torino, Italy	In progress
	O. Okoro (M.A.Sc.)	In progress
	P. Tabrizian (M.A.Sc.)	In progress
	Y. Babaee (Ph.D.) Co-Supervisor: Dr. Mulligan	2017
	A. Refaat (Ph.D.)	2016
	M. Panecka (Visiting M.A.Sc. student) Co-Supervisor: Dr. Tufenjki, McGill University	2016
	F. R. Omi (M.A.Sc.)	2015
	A. Soroush (M.A.Sc.)	2015
	S. Sultana (M.A.Sc.)	2014

Department of Electrical and Computer Engineering		
Faculty Name	**Student (Degree)**	**Year**
M. Zahangir Kabir	S. M. Arnab (Ph.D.)	In progress
	N. Hijazi (Ph.D.)	In progress
	D.M. Panneerselvam (M.A.Sc)	In progress
	Md M. Saleheen (M.A.Sc)	2016
	S. Siddiquee (M.A.Sc)	2015
	F. Manouchehri (Ph.D.) Co-supervisor: Dr. Pouya Valizadeh	2014
	S. Arnab (M.A.Sc)	2013
	S. Imam (M.A.Sc)	2013
	K. N. Sakib (M.A.Sc) Co-supervisor: Dr. Sheldon Williamson	2013
	S. A. Mahmood (Ph.D.)	2012
	M. Salehizadeh (M.A.Sc) Co-supervisor: Dr. Amir Aghdam	2011

	M. A. Mannan (M.A.Sc)	2011
	Md. S. Anjan (M.A.Sc)	2011
	M. H. Chowdhury (M.A.Sc)	2010
	Md. W. Rahman (M.A.Sc)	2010
	W. Shen (M.A.Sc)	2010
Faculty Name	**Student (Degree)**	**Year**
Mojtaba Kahrizi	P. Abedinisohi (Ph.D.)	In progress
	H. S. Farakh (Ph.D.)	In progress
	P. Laamerad (M.A.Sc.)	In progress
	Y. Li (M.A.Sc.)	In progress
	F. Mobasheri (M.A.Sc.)	In progress
	A. Mohandes (Ph.D.)	In progress
	Y. Molaei (M.A.Sc.)	In progress
	M. Mohebi (M.A.Sc.)	2014
	A. Hayeri (M.A.Sc.)	Left the program, 2014
	T. Hossaine (M.A.Sc.)	Left the program, 2014
	B. Yaghootkar (Ph.D.)	2014
	M. Z. Deroo (M.A.Sc.)	2013
	P. Abedinisohi (M.A.Sc.)	2013
	M. Amouzgar (Ph.D.)	2013
	M. Etezadbroujerdi (Ph.D.)	2013
	S. Spitsina (Ph.D.)	2013
	N. Chivu (Ph.D.)	2012
	M. Nassim (M.A.Sc.)	2012
	W. Chen (M.A.Sc.)	2010
Faculty Name	**Student (Degree)**	**Year**
Steve Shih	F. Ahmadi (M.A.Sc.)	In progress
	A. Firouzeh (Ph.D.)	In progress
	L. Leclerc (M.Sc.) Co-supervisor: Dr. David Kwan	In progress
	E. Moazami (M.A.Sc.)	In progress
	H. Sinha (M.A.Sc.)	In progress

Faculty Name	Student (Degree)	Year
Pouya Valizadeh	M. Aghayan (P.h.D.)	In progress
	J-L Gosselin (M.A.Sc.)	In progress
	H. Rahbardar-Mojaver (Ph.D.)	In progress
	A. Loghmany (Ph.D.)	2016
	J. Record (M.A.Sc.)	2016
	F. Manouchehri (Ph.D.) Co-supervisor: Dr. M.Z. Kabir	2014
	Md J. Sikder (M.A.Sc.)	2013
	S. Dargahi (M.A.Sc.) Co-supervisors: Dr. P. Pillay and Dr. S.S. Williamson	2011
	B. AlOtaibi (M.A.Sc.)	2011
	A. Loghmany (M.A.Sc.)	2010
	M. Moradi (M.A.Sc.)	2010
Faculty Name	**Student (Degree)**	**Year**
John Zhang	O. Cotte (M.A.Sc.)	In progress
	X. Jie (Ph.D.) Co-Supervisor: Dr. A. Kishk	In progress
	H. Sun (M.A.Sc.)	In progress
	W. Lutang (PDF)	In progress
	H. Mellah (Ph.D.)	In progress
	T. Weijie (M.A.Sc.)	In progress
	X. Xiaoran (M.A.Sc.)	In progress
	Y. Xiong (Ph.D.)	In progress
	C. Xinyu (Ph.D.)	In progress
	J. Xu (Ph.D.) Co-supervisor: Dr. A. Kishk	In progress
	G. Zhou (Ph.D.)	In progress
	S. Saha (M.A.Sc.)	2016
	J. Zhang (Ph.D.) Co-supervisor: Dr. A. Kishk	2016
	R. Zhu (Ph.D.)	2016
	X. Zichen (M.A.Sc.)	2016
	L. Juras (M.A.Sc.)	2015
	L. Gu (Visiting PhD)	2014
	A. Jawarneh (Ph.D.)	Changed supervisor, 2014
	X. Yue (M.A.Sc.)	Left the program, 2014

Department of Mechanical, Industrial and Aerospace Engineering		
Faculty Name	**Student (Degree)**	**Year**
Robin Drew	E. Rezabeigi (Ph.D.)	2015
	L. Aguilar-Perales (Ph.D.)	2014
	A. Alem (Ph.D.)	2014
	M. Lafrance (Ph.D.)	2012
	Y. Aguilar (Ph.D.)	2012
	P. Proa (Ph.D.)	2010
Faculty Name	**Student (Degree)**	**Year**
Mamoun Medraj	A. Mostafa (PDF)	In progress
	S. Abdessameud (Ph.D.)	2016
	A. Gujba (Ph.D.)	2016
	D. Kevorkov (PDF)	2016
	M. Madipoor (Ph.D.)	2016
	H. Kirols (M.A.Sc.)	2015
	B. Komolafe (M.A.Sc.)	2015
	X. Zhang (M.A.Sc.)	2015
	M. Islam (PDF)	2014
	A. Mostafa (Ph.D.)	2014
	Y. Elshaer (PDF)	2013
	Md. I. Khan (M.A.Sc.)	2013
	S. Konica (M.A.Sc.)	2013
	G-J Rocher (M.A.Sc.)	2013
	C. Shekhar (PDF)	2013
	T.Wang (M.A.Sc.)	2013
	Md M. Islam (Ph.D.)	2012
	T. Nguyn (PDF)	2012
	G.Arzpeyma (M.A.Sc.)	2011
	P. Ghosh (PDF)	2011
	M. Shamekh (Ph.D.)	2011
	J. Yi (M.A.Sc.)	2011
	A. Changizi (M.A.Sc.)	2010
	A-S Kabir (M.A.Sc.)	2010
	F. Tarasi (Ph.D.)	2010
	Y. Zhang (M.A.Sc.)	2010

Faculty Name	Student (Degree)	Year
Sivakumar Narayanswamy	Hamid Ebrahimi Orimi (Ph.D.)	In progress
	Satvik Jagadeesh (MASc)	In progress
	Shyam Dulkhed (M.A.Sc.)	2016
	Vinodh Krishna Caralapatti (M.A.Sc.)	2016
	Hossien Kamkarrad (Ph.D.)	2016
	Mehrnegar Aghyan (M.A.Sc.)	2015
	Anthony Tony (M.A.Sc.)	2011
	Mohammad Kamal (Ph.D.)	2011
	Etienne Mfoumou (Ph.D.)	2012
	Harish Krishnan (M.A.Sc.)	2012
Faculty Name	**Student (Degree)**	**Year**
Muthu Packirisamy	J. Abdul-Hadi (Ph.D.) Co-supervised	In progress
	S. Badilescu (RA)	In progress
	S. Bathini (Ph.D.)	In progress
	N. Bandari (Ph.D.) Co-supervised	In progress
	M. Fanous (M.A.Sc.)	In progress
	M. Habibi (RA)	In progress
	S. Jayan (Ph.D.) Co-supervised	In progress
	P. Keshav (M.A.Sc.) Co-supervised	In progress
	R. Kumar (M.A.Sc.)	In progress
	K. Kuvinanshetty (Ph.D.)	In progress
	M. Marzban (Ph.D.) Co-supervised	In progress
	J. Ozhikandathil (RA)	In progress
	P. Pottier (RA)	In progress
	D. Raju (Ph.D.)	In progress
	A. Sohrabi (Ph.D.)	In progress
	E. Yadanpanah-Moghadam (Ph.D.) Co-supervised	In progress
	H. Xiaoxi (Ph.D.) Co-supervised	In progress
	A. Mittal (M.Eng) Co-supervised	2016
	C. G. Agudelo (Ph.D.)	2015
	R. Atta (RA)	2015
	B. Mazaheri (M.Eng) Co-supervised	2015
	M. Ghanbari (Ph.D.)	2014
	A. Khosla (RA)	2014
	Mohammad (Ph.D.) Co-supervised	Left the program, 2014
	A. S. Nezhad (Ph.D.) Co-supervised	2013
	H. Sadabadi (Ph.D.) Co-supervised	2013

R. Ahmadi (Ph.D.) Co-supervised	2012
N. Anand (M.A.Sc.)	2012
A. Mahmoud (Ph.D.) Co-supervised	2012
J. Ozhikandathi (Ph.D.)	2012
P. Rangaiah (M.A.Sc.)	2012
A. Ravishankar (M.A.Sc.)	2012
S. Stoenescu (Ph.D.) Co-supervised	2012
S. Venkatesh (M.A.Sc.)	2012
A. Vyas (M.A.Sc.) Co-supervised	2012
A. Atieh (M.A.Sc.) Co-supervised	2011
P. Ashtaputre (M.A.Sc.) Co-supervised	2011
A. Chandrasekaran (Ph.D.)	2011
P. Devi (M.A.Sc.)	2011
A. F. Fadi (M.Eng) Co-supervised	2011
K. Mohammad (Ph.D.) Co-supervised	2011
A.H. Paneri (M.A.Sc.)	2011
M. Shaparnia (M.A.Sc.) Co-supervised	2011
J. You (Ph.D.) Co-supervised	2011
J. K. Baral (RA) Co-Supervisor: Dr. Truong Vo-Van	2010
M. Davoud (Ph.D.) Co-supervised	2010
Q. Fang (M.A.Sc.) Co-supervised	2010
H. Shakhawat (M.A.Sc.) Co-supervised	2010

5.1.2 **Overall faculty characteristics**

Dr. Pablo Bianucci is an Assistant Professor in the Department of Physics. He is an expert in the fields of experimental optics and condensed matter physics, especially at their interface such as the study of the optical properties of semiconductor nanostructures. The small dimensions of nanostructures can greatly affect their optical properties as compared to the bulk material, making optical studies key for understanding how the nanostructures are different to bulk. Among the optical tools his group uses to study optical properties, one of the most important is photoluminescence spectroscopy. For instance, recently his group has performed photoluminescence spectroscopy of zinc oxide nanorods which they synthesized. They also do research on optical microresonators, microscopic structures capable of confining light in very small spaces.

Dr. John Capobianco is a Full Professor in the Department of Chemistry and Biochemistry. He is a pioneer in the spectroscopy, synthesis and characterization of nanoparticles doped with lanthanide ions, his expertise lies in the upconversion and luminescent properties of inorganic nanoparticles. With 30 years of experience, he uses optical spectroscopy, TEM, XPS, NMR,

FTIR, Raman, Time Resolved Spectroscopy, to characterize upconverting nanoparticles for potential applications in cell targeting, imaging, diagnostic medicine, photodynamic therapy, drug delivery, forensics and security. A primary focus is the development of multimodal nanoparticles for the detection, imaging and treatment of cancers and for optogenetic applications. He is a Senior Research Chair in Nanoscience and was recently named as a Fellow of the Royal Society of Chemistry.

Dr. Alexandre Champagne is an Associate Professor in the Department of Physics. He is an expert in experimental electron transport in nanoscale and mesoscopic systems. His work focuses on the fundamental understanding of the interplays between the mechanics and electronic sat the nanoscale. For instance his group studies tunable high-frequency oscillators (NEMS) made of graphene and carbon nanotubes, measures thermal transport in graphene, explores the effect of mechanical strain on the quantum properties of nanomaterials, and researches transport in defect-engineered silicon nanowires. He previously made seminal contributions to the understanding of the electro-mechanics of single-molecules, suspended graphene and carbon nanotubes. He is a Concordia University Research Chair (Tier II) in Nanoelectronics and Quantum Materials.

Dr. Christine DeWolf is an Associate Professor in the Department of Chemistry and Biochemistry. She is an expert in surface and interfacial phenomena, her research focuses on the molecular self-assembly of nanostructured, nanopatterned and functional thin film coatings, in particular coatings that confer biocompatibility to nanoparticles and enable their use as nanoprobes and nanocarriers for bioimaging and drug delivery applications. She also studies the interaction of nanoparticles with biological membranes, with a particular focus on the lungs as a means on entry for airborne nanoparticulate. She is the co-founder and co-director of the Concordia Centre for NanoScience Research, serves on the International Advisory Board for the International Conference on Organized Molecular Films and is the Vice-Chair of the Physical, Theoretical and Computational Division of the Canadian Society for Chemistry.

Dr. Robin Drew is a Full Professor in the Department of Mechanical, Industrial and Aerospace Engineering. He is an expert in advanced materials, including metal foams, metal ceramic composites (mostly MMCs), metal ceramic joining processes and joining processes. He is internationally renowned for his work in these areas. He is author and co-authored of over 200 papers on metals, ceramics, metal-ceramic composites and the fundamentals of metal-ceramic interactions and joining and has contributed chapters to several books and conference proceedings. He has served on a number of international advisory and organizational committees for conferences and symposia and has been an invited speaker at many international meetings.

Dr. M. Zahangir Kabir is an Associate Professor in the Department of Electrical and Computer Engineering. He is an expert in theory, physics-based modeling, and characterization of electronic materials and devices with applications to photoconductors for optical and X-ray detectors, heterojunction field effect transistors (HFETs), and nano-structured solar cells. His research group is presently working on physics-based modeling and analysis of bulk heterojunction organic and perovskite solar cells. They are also investigating the charge carrier generation and charge transport mechanisms in amorphous selenium photoconductor at extremely high electric fields and

also working on appropriate detector designs for high-gain avalanche detectors for very low dose diagnostic medical X-ray imaging applications.

Dr. Mojtaba Kahrizi is a Full Professor in the Department of Electrical and Computer Engineering. He is an expert in micro and nano structures. Dr. Kahrizi's research spans a wide spectrum under the umbrella of Material Sciences, Solid State Devices, Microelectromechanical Systems, and Nanoscience and Nanotechnology. He has been actively involved in investigate fundamental issues related to micro and nano structures, designing and fabricating micro/nano devices with applications in biomedical, sensors, and energy storage. Most recently, he is involved with researches to develop low cost fabrication of semiconductor nanowires, like silicon, ZnO and TiO2 with applications to develop greenhouse gas detectors, hydrogen storage and detection of micro molecules in water. He is author and coauthor of almost 200 journal and conference articles.

Dr. Mamoun Medraj is a Full Professor in the Department of Mechanical, Industrial and Aerospace Engineering. He is an expert in nano-structured coatings and metal matrix nano compositses. Mamoun Medraj's career background is in materials and mechanical engineering. He has carried out experimental and theoretical studies on materials development and processing. He worked on the development and characterization of novel nano-structured coatings and metal matrix nano-composites. He has experience with the use of thermodynamic modeling for materials development and processing. His current projects include the development of water erosion resistant coatings and surface treatments, development of Fe-based magnetic materials for automotive and power generation industries. Mamoun has successfully supervised or co-supervised 28 MASc and 7 PhD students to graduation. He has published 112 papers in peer-reviewed journals.

Dr. Catherine Mulligan is a Full Professor in the Department of Building, Civil and Environmental Engineering. She is an expert in environmental applications of nanotechnology. A focus of Dr. Mulligan's current research is to develop advanced nano-composite materials for water and wastewater treatment. Her research interests include: (i) environmental applications of engineered nanomaterials, (ii) water and wastewater purification, (iii) soil, sediment and mining residue remediation (iv) production of energy from wastewater and water. Dr. Mulligan is Concordia Research Chair in Geoenvironmental Sustainability and Director of the Concordia Institute of Water, Energy and Sustainable Systems. Dr. Mulligan is a Fellow of the Canadian Society for Civil Engineering and Engineering Institute of Canada. She has successfully supervised 55 graduate students (37 MASc and 18 PhD) to completion and has published more than 90 papers in peer-reviewed journals and 6 books.

Dr. Rafik Naccache is an Assistant Professor in the Department of Chemistry and Biochemistry (hire date: December 2015) and a strategic hire in nanomedicinal chemistry. He is an expert in nanomaterials synthesis and nanomedicinal chemistry with 10 years of experience in pharmaceutical research and development at Merck Frosst Canada, Ltd. His research focuses on the synthesis and characterization of luminescent carbon dots, plasmonic (including gold and silver nanoparticles), and iron oxide nanomaterials, as well as their integration in imaging, sensing and drug delivery applications. He uses TEM, SEM, XPS, FTIR, Raman, NMR and time-resolved ultrafast spectroscopy techniques such as transient absorption spectroscopy and time-correlated single photon counting to engineer nanomaterials and nanoconstructs. In 2016, he was awarded an

NSERC Discovery ($210,000 for 5 years) and a Discovery Accelerator Supplement ($120,000 for 3 years).

Dr. Sivakumar Narayanswamy is a Full Professor in the Department of Mechanical, Industrial and Aerospace Engineering. He is an expert in optics with applications in metrology and micromachining. In metrology, he and his research team has worked on developing interferometric systems for static, dynamic and surface profile measurements with subnanometer resolution and accuracy. His research group is currently concentrating on non-destructive testing of aerospace composites with a novel high repetition rate laser ultrasonic system. He is currently developing both the theory and experimental system for the same. In the micromachining, his group is concentrating on nanostructuring solar cells, surfacing, micromachining, and laser shock peening for biodegradable implants to improve corrosion resistance. He is part of the advanced manufacturing research facility which is applying to CFI for a Femtosecond laser that can enable nanomachining inside glass and other hard to machine materials.

Dr. John Oh is an Associate Professor in the Department of Chemistry and Biochemistry. Trained as a polymer chemist and a materials scientist in both academia and industry, he is currently leading a research group that focuses on the design, synthesis and processing of polymer-based smart nanomaterials as drug delivery nanocarriers and cellular imaging for biomedical applications. He is particularly interested in how these nanomaterials interact with biological systems to help understand their biological functions, thus offering enormous potential for cancer research and treatment. He has expanded his research scope to the development of self-healable and high performance crosslinked materials for industrial applications. He is a Canada Research Chair Tier II in Nanobioscience.

Dr. Muthu Packirisamy is a Full Professor in the Department of Mechanical, Industrial and Aerospace Engineering. He is an expert in the areas of Nanosynthesis, Micro-Nano-Bio Integration Center, Optical Bio Microsystems, In-Situ and Ex-situ Nano Integration of Lab On Chip and microsensors, he develops and studies nano integrated microsystems for various applications. Packirisamy is a Professor and Concordia Research Chair on Optical BioMEMS in the Department of Mechanical and Industrial Engineering, Concordia University, Montreal, Canada. As Director of Micro-Nano-Bio Integration Center and Optical Bio Microsystems Lab, he developed this lab focusing on Lab on Chip, Bio-Microsystems and micro-nano integration. He is the recipient of Member Royal Society of Canada College, Fellow of American Society of Mechanical Engineers, Fellow of Institution of Engineers India, Fellow of Canadian Society for Mechanical Engineering and I.W.Smith award from Canadian Society for Mechanical Engineering, Concordia University Research Fellow, Petro Canada Young Innovator Award and ENCS Young Research Achievement Award. As an author of more than 350 articles published in journals and conference proceedings, Professor Packirisamy has 15 inventions in the area of micro and nano systems. He has supervised more than 9 Research Associates, 16 PhDs and 50 Master students. He was successful in obtaining grants worth of more than $11 Million. He has also recently published a textbook, BioMEMS: Engineering and Science Perspectives (CRC Press, 2011), and 3 book chapters, to provide a comprehensive background in the area of bio-microsystems. His Recent invention on energy harvesting from photosynthesis of blue green algae had more than 3000 citations around the world and was covered by most of the countries and media throughout the world including Canadian Broadcasting Corporation (CBC), NDTV, Montreal Gazette, National Sciences and Engineering

Research Council of Canada, Royal Society of Canada, International Business Times, Thomson Reuters, and many more.

Dr. Gilles Peslherbe is a Full Professor in the Department of Chemistry and Biochemistry. He is an expert in chemical modeling and computational chemistry, his research focuses on the development of computer tools for realistic, molecular-level, simulations of chemical processes and their application to a wide range of problems relevant to materials science, the life sciences and the environment. Current research directions include investigation of carbon-based nanoclusters as potential non-toxic catalysts and as components of molecular electronics. He is the director and founder of CERMM, the Concordia Centre for Research in Molecular Modeling and held a Concordia University Research Chair in Computational Chemistry for two terms (11 years).

Dr. Saifur Rahaman is an Assistant Professor in the Department of Building, Civil and Environmental Engineering. He is an expert in environmental applications and implications of nanotechnology. The primary focus of Dr. Rahaman's current research is to develop advanced nano-composite materials and novel membrane-based processes for water and wastewater treatment. His research interest includes (i) environmental applications and implications of engineered nanomaterials, (ii) membrane separations for water and wastewater purification, (iii) electrochemical advanced oxidation for disinfection and destruction of trace contaminants, and (iv) resource recovery from industrial wastewater. Dr. Rahaman received a number of prestigious awards including Petro-Canada Young Innovators Award (2015), NSERC Postdoctoral Fellowship (2010-2012) and British Columbia Water & Waste Association (BCWWA) Student Achievement Award (2009).

Dr. Steve Shih is an Assistant Professor in the Department of Electrical and Computer Engineering. He is an expert in developing new lab-on-chip (i.e. microfluidic) tools for solving problems related to synthetic biology. Typically microfluidic devices entail manipulating fluid flows inside micron-sized dimension channels, however, in my laboratory we are working with manipulating droplets inside micro channels and on surfaces that contains an array of electrodes. These types of microfluidic devices contain numerous advantages that include on-demand mixing, throughput, and automation. We plan to use these fabricated devices and apply them to problems related to energy, to health, and to synthetic biology.

Dr. Pouya Valizadeh is an Associate Professor in the Department of Electrical and Computer Engineering. He is an expert in the field of compound semiconductor devices. He has significant experience in physics-based and analytical modeling, design, microfabrication, and reliability investigation of transistors in III-nitride technology for microwave and power electronic applications. He also has research interests in the area of Micro Electro Mechanical Systems for wireless communication. In this area, he has experience in design and microfabrication of Giga Hertz micro-resonators and novel MEMS based charge-pump architectures for CMOS compatible on-chip +100V DC generation, based on surface micromachining technology.

Dr. Panagiotis Vasilopoulos is a Full Professor in the Deptartment of Physics. He is an expert in theoretical magneto-transport and quantum many-body effects in novel two-dimensional nanosystems, such as graphene, silicene, topological insulators, and transition-metal dichalcogenides (TMDs), such as MoS2. He studies transport with general conductivity

expressions, derived within linear response theory, and cast explicitly in terms of single-particle eigenstates and eigenvalues of the system Hamiltonian. Some magneto-optical responses can be tuned in the microwave-to-terahertz and visible frequency ranges in contrast with a conventional two-dimensional electron gas or graphene in which the response is limited to the terahertz regime. This ability to isolate carriers in an anisotropic structure may make many of these systems promising candidates for new optical nanodevices, spin and valley filters, etc. Currently the research focus is on atomic collapse and many-body effects in graphene, silicene, and TMDs.

Dr. Truong Vo-Van is a Professor Emeritus in the Department of Physics. He is an expert in the optical and electrical properties of nanostructured thin films and their applications. His group's current activities are focused on smart coatings made of electrochromic and photochromic materials. Electrochromic films change their optical properties in a reversible way using a small applied electric field while thermochromic materials change their properties following the application of heat. The type of nanostructures present in these films can influence greatly their behavior and can be used to enhance the optical properties (e.g., higher optical density changes) as well as other critical film properties (e.g., switching times). As an example, his group investigates vanadium dioxide, where a phase transition from insulator to metal is accompanied by large changes in the refractive index. Broadband, highly efficient polarization control by a single layer of vanadium dioxide can be achieved. Since the phase transition of the material may be activated thermally, optically or electrically, it offers great flexibility for device operation.

Dr. Valter Zazubovits is an Associate Professor in the Department of Physics. He is an expert in the study of primary processes of photosynthesis - energy transfer, charge transfer as well as the interplay between these processes with protein dynamics. His group is specifically interested in light-induced conformational changes in proteins, and more broadly in optical methods widely applied to various nanoscale biophysics problems. In addition, his team is working on biosensors for explosives detection based on photosynthetic reaction centres, and on the opto-electronics of nanomaterials such as graphene and carbon nanoparticles for supercapacitors.

Dr. John Xiupu Zhang is a Full Professor in the Department of Electrical and Computer Engineering. He is an expert in InP compound semiconductors, including quantum dot lasers and broadband uni-traveling photodiodes. He collaborates with NRC in Ottawa in quantum dot lasers. He is also conducting research in the applications of nano-devices to future telecommunications, such as 5G.

5.1.3 Regulations governing professor qualifications to supervise master's and doctoral students, where applicable

5.1.4 Faculty workloads

Concordia has in place policies that recognize and balance the varying research, teaching and administrative work profiles of its faculty.

More specifically for this program the graduate program director of this program will be allotted one course remission per year in recognition of the associated administrative workload.

5.2 Material Resources (Reference materials, computers, equipment and space) (required and available)

5.2.1 Library Resources

See Appendix 2 for a detailed report.

5.2.2 Computer facilities, Laboratories and Research Space

i) Computer Facilities

Concordia provides Information Technology (IT) consultative services, infrastructure, computer hardware and software as needed.

This includes comprehensive support for courses, strong generic computing infrastructure support for research and consultative services and support for specialized research IT assets. All users benefit from easy to access support.

Department of Chemistry and Biochemistry
Laser Spectroscopy Lab (Capobianco), 136 square meters (SP building)
Surface Characterization lab (DeWolf), 51 square meters (SP building)
Nanomaterials lab (Naccache), 60 square meters (SP building)
Polymeric Nanomaterials Lab (Oh), 100 square meters (SP building)
Centre for Research in Molecular Modelling (Peslherbe, director), 60 square meters (SP building)
Centre for NanoScience Research (Capobianco & DeWolf, co-directors), 44 square meters (SP building)

Department of Electrical and Computer Engineering
T Class 1000, 10000 cleanrooms (210 m^2
Device Measurement and Characterization Lab 38 square meters (EV Building)
Nano-Photonics Lab 42 square meters (EV Building)
Advanced Photonic Systems Lab 38 square meters (EV Building)

Department of Physics
Nano-optics Lab (Bianucci), 65 square meters (SP building)
Nano-electronics Lab (Champagne), 65 square meters (SP building)
Applied Nanophysics Lab (Vo-Van), 100 square meters (SP building)
Nano Biophysics Lab (Zazubovits), 65 square meters (SP building)
Note: P. Vasilopoulos is a theorist and does not have a lab.

ii) Equipment

Department of Chemistry and Biochemistry

Synthesis facilities:
- Schlenk lines
- Centrifuges
- Gloveboxes
- Microwave reactors
- UV (ultra-violet) reactors and lamps
- Incubators
- GPC (Gel Permeation Chromatography)
- GC (Gas Chromatography)
- Rotavaps
- Vacuum ovens and vacuum pumps
- Sonicators
- Combiflash fraction collectors
- Chemical storage facilities
- Ozone generators

Materials Characterization:
- Agilent and Cary Fluorimeters
- Thermo-scientific/Nicolet ATR-IR (attenuated total reflectance infrared spectroscopy)
- Cary UV-Vis (ultra-violet visible) Spectrometer
- Malvern DLS (dynamic light scattering) and zetapotential
- TA Instruments TGA/DSC (thermogravimetric analysis/differential scanning calorimeter)
- TA Instruments rheometer
- Setaram DSC (differential scanning calorimeter)
- Powder and single crystal x-ray diffractometers (Bruker)
- New Instrumentation applied: Transmission Electron Microscope

Surface Characterization and Thin Film Preparation:
- Metal evaporator
- Jelight ozone cleaner
- Kibron multiwall surface tensiometer
- Bruker multimode AFM/STM (Atomic force microscopy/scanning tunneling microscopy)
- Sinterface Profile Analysis Tensiometer
- Planar bilayer workstation
- Nima Langmuir troughs with dipping wells for Langmuir-Blodgett transfers
- Nima Langmuir troughs coupled with Brewster angle or fluorescence microscopy
- Nanofilm imaging ellipsometer and Brewster angle microscope
- Olympus optical microscope for fluorescence and polarized light microscopy
- Linkam DSC (differential scanning calorimeter) heating/cooling microscope stage

Laser spectroscopy and microscopy:
- Optical spectroscopy covering a large range of wavelengths from UV to IR
- Lifetime spectrometer

Molecular Modelling/Computational Facilities:
Servers:
- Computing server (operated for Calcul Québec), 84 nodes with 12 cores and 60GB RAM each, 24TB storage
- Development server, 12 nodes with 8 cores 8GB RAM each, 4TB storage
- Backup server, 12 cores and 12GB RAM, 15TB storage
- WebMO server, 4 cores and 8GB RAM, 1.5TB storage
- Web server, 4 cores and 8GB RAM, 1.5TB storage
- Office backup server
- Software: Gaussian and GaussView, Molpro, Amber16, AIMAll, Quantum Espresso, NAMD, NWChem, Siesta, VASP, WebMO, Wien2k, CPMD, CP2K

Department of Electrical and Computer Engineering

Besides all general lab equipment, the following fabrication and characterization facilities are available in ENCS:
All VLSI fabrication equipment including mask-aligner, oxidation/diffusion furnaces, metal evaporator/metallization machines, sputtering equipment, wire bonding, potentiostat, facilities to grow nanowires, semiconductor etching setup, SEM, plasmalab, deep reactive ion etcher, nanosecond pulsed laser, microelectronics system analyzer, optical system analyzer, cryogenics (low-temperature systems), liquid helium DC and RF electron transport cryostat, cryogen-free 0.3 K electron transport cryostat (+ in situ mechanical strain), superconducting magnet 9T and 14 Tesla, helium bath optical cryostats, closed-cycle optical cryostat, RF analog source up to 40GHz, lock-in amplifiers: 600 MHz and 110 KHz, signal analyzer up to 26.5 GHz, high-resolution DC electronics (current and voltage pre-amps, sources, amplifiers, acquisition cards), RF and DC components, DC probe station with 5 probes, Dedicated micro-Raman spectrometer with 532nm laser, state-of-the art 2d mapping and data analysis, high-resolution tunable dye laser system; 650-730 nm (Sirah Matisse pumped by Spectra-Physics Millennia 6W 532 nm green laser), tunable titanium-sapphire laser (Spectra-Physics; 720-1000 nm, pumped by green laser), complete optical table setups, light spectrometers UV-VIS-NIR and others, dual Polarization Interferometer, perkin-Elmer MP44 spectrofluorimeter, miniaturized Laser Flash Photolysis System, high resolution upright optical microscope with high res CCD.

Department of Physics

- Cryogenics (low-temperature systems)
- Liquid Helium DC (direct-current) and RF (radio-frequency) electron transport cryostat
- Cryogen-free 0.3 Kelvin electron transport cryostat (+ in situ mechanical strain)
- Superconducting magnet 9T and 14 Tesla
- Helium bath optical cryostats
- Closed-cycle optical cryostat
- Dilution refrigerator (7 milli-Kelvin) with superconducting magnet

Electronics:
- RF analog source up to 40GHz
- Lock-in amplifiers: 600 MHz and 110 KHz
- Signal analyzer up to 26.5 GHz
- High-resolution DC electronics (current and voltage pre-amps, sources, amplifiers, acquisition cards)
- Network analyzer
- RF (radio-frequency) and DC (direct current) components
- DC probe station with 5 probes

Optics:
- Dedicated micro-Raman spectrometer with 532nm laser, state-of-the art 2d mapping and data analysis
- High-resolution tunable dye laser system; 650-730 nm (Sirah Matisse pumped by Spectra-Physics Millennia 6W 532 nm green laser)
- Tunable Titanium-Sapphire laser (Spectra-Physics; 720-1000 nm, pumped by green laser)
- Complete optical table setups
- Light spectrometers UV-VIS-NIR and others
- Dual Polarization Interferometer
- Perkin-Elmer MP44 spectrofluorimeter
- Miniaturized Laser Flash Photolysis System
- High resolution upright optical microscope with high res CCD (charge coupled device)

MicroFabrication:
- Thermal deposition vacuum chamber with 2 sources
- Electron beam deposition vacuum chamber with 6 sources
- Wire bonder
- Chemical vapor deposition (CVD) growth chamber for nanotubes and other nanomaterials
- Resist spinner
- Fume hoods
- Sonicator, and scales

5.2.3 **Student workspace**

Thesis students are allocated 4 to 5 m^2 of space in a shared office environment. Some students will also have reserved work space within laboratories.

5.3 **Funding for Graduate Students**

To ensure that this program complements and not simply duplicates our existing research programs, additional seed funding will be provided for student support to develop the program

sufficiently so that funding can be generated within the program. This additional financial support (beyond the regular TA/GSSP support) will come from MSc and MASc fundings and/or bursaries. The Faculties will use some of their existing MSc and MASc funds to support first year students. The goal of these funds is to reduce the RA support needed from individual PIs. For instance, the funds could replace the RA during the 1st year of study (course portion) while the PIs would then provide the RA support during the 2nd year. This seed funding will stimulate new collaborations (especially in the early stages when the research funding held by PIs is already committed elsewhere) and accelerate the program's success. The students in the NSNT program will be permitted to compete for these awards within the regular allotment of each department. After three years, the program will be reviewed and we expect that the number of masters funds allocated to the program will be gradually reduced and replaced by support from grants and MITACS funds based on the research developed by the NSNT program.

5.4 Chart of Expenses and Revenues

Concordia University		Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
FTEs for Yr 1 students (11.25 credits/term/2 terms)	10	7.50	6.00				13.50
FTEs for Yr 2 students	10		7.50	6.00			13.50
FTEs for Yr 3 students	12			9.00	7.50		16.50
FTEs for Yr 4 students	14				10.50	9.00	19.50
FTEs for Yr 5 students	16					10.50	10.50
Student Enrolment		**7.50**	**13.50**	**15.00**	**18.00**	**19.50**	**73.50**
Revenue							
Tuition Revenue ($1017.82 per term per FTE x 2 terms)	2,036	15,270	27,486	30,540	36,648	39,702	149,646
Teaching grant (base of $3,507.92/FTE x 4.42) - ENCS	15,505		116,288	209,318	232,575	279,090	837,270
Variable support grant (per raw FTE $1,658.65)	1,659		12,443	22,397	24,885	29,862	89,586
Total Anticipated University Revenue (only includes teaching & tuition revenue)		**15,270**	**156,216**	**262,254**	**294,108**	**348,654**	**1,076,502**
Expenses							
Library expenses		10,166	10,166	10,166	10,166	10,166	50,830
Course section	33,999	33,999	33,999	33,999	33,999	33,999	169,995
Course sections (GPD remission) from the Provost's Office	11,333	11,333	11,333	11,333	11,333	11,333	56,665
Entrance Award ($5000 in first year) - ENCS		25,000	25,000	30,000	35,000	40,000	155,000
Bursary budget		87,500	107,500	125,000	60,000	70,000	450,000
Advertising		3,000	2,000				5,000
Recruitment		3,000	2,000				5,000
Total Anticipated Expenses		**173,998**	**191,998**	**210,498**	**150,498**	**165,498**	**892,490**
		(158,728)	(35,782)	51,756	143,610	183,156	184,012
Anticipated Gain (Loss) for the University							

Notes:
Revenues delayed by one year except Soutiens (variable support grant)
Attrition rate of one student per year in ENCS and FAS.

The GPD remission cost in total $11,333 per year.
This budget assumes that each Faculty will admit 5 students per year.
Teaching grant is based on engineering Clarder code; science Clarder is 6.59, meaning that this budget is an underestimation of revenue.

CURRICULUM DOCUMENTS

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CHEM-61** VERSION: 8

PROGRAM CHANGE: Nanoscience and Nanotechnology

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 20xx/20xx
Implementation Month/Year: TBD 20xx

Faculty/School: Arts and Science, Engineering and Computer Science
Department: Chemistry and Biochemistry, Physics, BCEE, ECE, MIA
Program: Nanoscience and Nanotechnology
Degree: MASc, MSc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[ ] Editorial [ ] Requirements [ ] Regulations [ ] Program Deletion [X] New Program

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	Nanoscience and Nanotechnology MSc/MASc **Admission Requirements** With their application, students must indicate through which of the participating departments they wish to have their application reviewed. Applicants are considered by the Nanoscience and Nanotechnology Admission Committee (comprised of two representatives each from the Faculty of Arts and Science and the Faculty of Engineering and Computer Science, from the participating departments). Should the applicant be accepted into the MSc/MASc Nanoscience and Nanotechnology program, an offer of admission originates from the home department, and the home department provides administrative support to the student. The program is open to full-time students only; due to the intensive core course training, only September entry is permitted. The following undergraduate degrees with high academic standing are eligible: bachelor's degree in science disciplines with a major in physics, chemistry, biochemistry or related disciplines; bachelor's degree in any of the engineering disciplines. The applicant must have a bachelor's/baccalaureate degree (or equivalent) with high standing (e.g., with honours, or the Concordia equivalent of a GPA of at least 3.00 on a scale of 4.30). Applicants are required to provide two letters of recommendation with the Academic Assessment form and a short statement of purpose. Language Proficiency Requirements: A student whose primary language is not English must write a pre-admission proficiency test. Proof of proficiency in English must be provided by achieving the appropriate score on one of the following: **Test of English as a Foreign Language (TOEFL)** The minimum acceptable score for the internet-based TOEFL (TOEFL iBT) is 90 and

no part under 20 (for the Faculty of Engineering and Computer Science 85 and no part under 20).

International English Language Testing System (IELTS)
The minimum band score for IELTS is 6.5 and no part under 6.5.

Please note: individual programs may require a higher minimum score.

Degree Requirements

The requirements described here are in addition to the general degree requirements for the Master's programs in the Faculty of Engineering and Computer Science (for MASc students) or the Faculty of Arts and Science (for MSc students).

1. **Credits.** A fully-qualified candidate is required to complete a minimum of 45 credits.

2. **Residence.** The minimum residence requirement is one year (3 terms) of full-time study.

3. **Courses.** Students must complete a minimum of 12 credits, including,

(i) intensive core course (NANO 610, 6 credits) to be taken in the first term after entry.

(ii) two 600-level elective courses selected from the Nanoscience and the Nanotechnology course lists below (Note: one of these may be replaced with an appropriate 600-level course from the student's home department with the approval of the thesis advisory committee).

Nanoscience course list
CHEM 651 (3 credits) Nanochemistry
CHEM 652 (3 credits) Nanomaterial Characterization
PHYS 636 (3 credits) Condensed Matter Physics I
PHYS 679 (3 credits) Selected Topics in Applied Physics

Nanotechnology course list
CIVI 6681 (4 credits) Environmental Nanotechnology
ELEC 6241 (4 credits) VLSI Process Technology
ELEC 6281 (4 credits) Principles of Solid State Nanodevices
MECH 6491 (4 credits) Engineering Metrology and Measurement Systems

4. **Thesis.** Students must complete a 33-credit thesis. The thesis must be completed under the co-supervision of two participating faculty members, with one supervisor from ENCS and one from FAS. In all cases the supervisor from the student's home faculty serves as the main supervisor (PI) and the co-supervisor is from the other faculty. Each student has a thesis advisory committee comprised of the two supervisors plus one member from each faculty. The advisory committee is responsible for the assessment of the student's academic progress in conjunction with the home department.

Academic Regulations

1. **GPA Requirement.** The academic progress of students is monitored on a periodic basis. To be permitted to continue in the program, students must obtain a cumulative grade point average (GPA) of 3.00 based on a minimum of 12 credits. Students whose GPA falls below 3.00 are considered to be on academic probation during the following review period. Students whose GPA falls below 3.00 for two consecutive review periods are withdrawn from the program.

2. **C Rule.** Students in research master's/magisteriate programs are allowed to receive no more than one *C* grade in order to remain in good standing in the university.

3. **F Rule.** Students who receive a failing grade in the course of their studies are withdrawn from the program. Students may apply for readmission. Students who receive another failing grade after readmission are withdrawn from the program and are not considered for readmission.

4. **Time Limit.** All work for a master's/magisteriate degree for full-time students must be completed within 9 terms (3 years) from the time of initial registration in the program at Concordia University.

Courses

NANO 610 Principles of Nanoscience and Nanotechnology (6 credits)
Prerequisite: Enrolment in the MSc/MASc in Nanoscience and Nanotechnology.
This course introduces all students in the MSc/MASc Nanoscience and Nanotechnology program to the core science and engineering principles required for working at the boundary between these two nano-disciplines. It serves to ensure all students have a solid theoretical foundation in physical science and engineering principles to understand advanced topics in nanoscience and/or nanotechnology. It is comprised of four modules (two science-based and two engineering-based). Case studies complement lectures and provide students with a cross-section of backgrounds, disciplines and training. Emphasis is placed on collaborative work, learning to communicate across boundaries, directed learning and literature survey techniques. Course modules can include, but are not limited to: chemical and physical properties of materials at the nanoscale, synthesis of nanomaterials and nanostructures, nanomaterials characterization, introduction to quantum physics of nanomaterials, current limitations in nanoscience, interaction of biological systems with nanomaterials, toxicity and environmental risks of nanomaterials, environmental implications of engineered nanomaterials, nanomanufacturing, and nanotechnology at the food-energy-water nexus.

Nanoscience course list

CHEM 651 Nanochemistry (3 credits)
Prerequisites: CHEM 217, 218, 221, 222, 234, 235, 241, or equivalent.
This modular course covers the areas of production, characterization and applications of nanoscale structures and materials. Each module is taught by a different professor as well as guest lecturers. Topics may include (but are not limited to): size dependent properties, synthesis of organic and inorganic nanostructures, self-assembled structures, chemical patterning and functional nanopatterns, biomaterials. Nanometer scale fabrication techniques such as lithographic methods, nano-stamping and patterned self-assembly are

discussed. Modern analysis techniques such as atomic force microscopy and electron microscopy, which are used to map and measure at the single molecule level are introduced. Applications such as photonics, optical properties, biodetection and biosensors, micro- and nano-fluidics, nanoelectronics and nanomachines are presented. The course includes a term project carried out using the nanoscience facilities held in the department research labs.

CHEM 652 Nanomaterials Characterization (3 credits)
Prerequisite: 30 credits of CHEM courses including CHEM 293 or 335; or NANO 610.
This course covers state-of-the-art nanomaterials physical characterization techniques including but not limited to: dynamic light scattering, transmission and scanning electronic microscopies (size and morphology), X-ray powder and electron diffraction (crystallinity and phase identification), Fourier transform/attenuated total reflectance infrared, Raman and X-ray photoelectron spectroscopies (surface chemical state and chemical composition), differential scanning calorimetry and thermogravimetric analysis (polymorphism, moisture content and weight loss), Brunauer–Emmett–Teller analysis (surface area), nuclear magnetic resonance (chemical bonding and nuclei interactions). Content is delivered through lectures and laboratory demonstrations.

PHYS 636 Condensed Matter Physics I (3 credits)
Review of electron levels in periodic potentials, various band-structure methods, Thomas-Fermi and Hartree-Fock theories, screening, anharmonic effects crystals, inhomogeneous semiconductors, p-n junctions, transistors. Dielectric properties of insulators, ferroelectric materials. Defects in crystals. Magnetic ordering, paramagnetism, diamagnetism, ferromagnetism, phase transitions, superconductivity.

PHYS 679 Selected Topics in Applied Physics (3 credits)
This course reflects the research interests of the Physics faculty in Applied Physics and/or those of the graduate students working with them.

Nanotechnology course list

CIVI 6681 Environmental Nanotechnology (4 credits)
Topics include basic concepts of nanoscience and nanotechnology; characterization of nanomaterials; nanoscience and public policy aspects; nanoparticle transport and fate in the environment; nanohazard assessment and nanotoxicology; environmental engineering applications of nanotechnology: pollutants sensing, monitoring, control and remediation. A project is required.

ELEC 6241 VLSI Process Technology (4 credits)
Introduction to basic VLSI technologies; crystal growth, thermal oxidation, diffusion, ion implantation, chemical vapour deposition, wet and dry etching, and lithography. Layout, yield, and VLSI process integration. The lab demonstrates a semiconductor device fabrication process. A project is required.

ELEC 6281 Principles of Solid State Nanodevices (4 credits)
Prerequisite: ELEC 6271 or equivalent.
Theoretical basis of nanodevices. Overview of fundamental quantum phenomena in semiconductors. Electronics in low-dimensional structures (two-dimensional electron gas, quantum wire and dots, electron scattering, transport). High-speed electron devices based on quantum structures (nanoscale MOSFETs, high-electron-mobility transistors,

	resonant-tunneling diodes and transistors, superlattice-based transistors). Logic gates based on quantum devices. Quantum optoelectronics (optical transitions in quantum structures, quantum well, quantum dots photodetectors and lasers, quantum cascade lasers). Single electron devices. Carbon nanotube transistors, molecular electronics and spintronics. Nanodevice technology and characterization. A project is required. **Note:** Students who have received credit for ELEC 691X (Principles of Solid State Nanodevices) may not take this course for credit. **MECH 6491 Engineering Metrology and Measurement Systems (4 credits)** Introduction to metrology, linear and geometric tolerancing, non-optical and optical methods in form measurement, fundamentals of optical metrology, interferometry - theory and overview, Moiré and phase shifting interfereometry, speckle interferometry and holography, light sources, detectors and imaging systems. Applications to precision measurement, Doppler vibrometry and dynamic characterization, applications to MEMS (Micro-Electro-Mechanical Systems), and special topics include: nanometrology, X-ray interferometry and interference spectroscopy. A project is required.
Rationale: This addition describes the new cross-departmental, cross-Faculty thesis Masters program in Nanoscience and Nanotechnology.	
Resource Implications: The programs' resource requirements are described in the accompanying documents.	

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CHEM-61** VERSION: 8

PROGRAM CHANGE: Chemistry and Biochemistry Course Listing

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 20xx/20xx
Implementation Month/Year: TBD 20xx

Faculty/School: Arts and Science
Department: Chemistry and Biochemistry
Program: Nanoscience and Nanotechnology
Degree: MSc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[ ] Editorial [ ] Requirements [ ] Regulations [ ] Program Deletion [X] New Program

Present Text (from 2017/2018) calendar	**Proposed Text**
Courses Specific course offerings in subject areas listed under *Topics* will generally vary from year to year, depending on the availability of faculty and the requirements of graduate students in the program. In the MSc program, every student must complete CHEM 666 (Seminar); in the PhD program CHEM 668 (Seminar) and CHEM 896 (Research Proposal and Comprehensive Examination) must be completed by every student. Courses are worth 3 credits unless otherwise indicated. Over the next few years the department will offer a selection of courses from those listed below. Additional *Selected Topics* courses may be offered in a given year, and these will be identified by different subtitles. Further information on *Selected Topics* courses will be available from the department at the beginning of each academic year. **Topics in Analytical & Bioanalytical Chemistry** ... **Topics in Bioorganic & Organic Chemistry** ... **Topics in Bioinorganic & Inorganic Chemistry** .... **Topics in Multidisciplinary Chemistry** **CHEM 650 Selected Topics in Multidisciplinary Chemistry** This course explores themes within the area of Multidisciplinary Chemistry. **Note:** The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content	**Courses** Specific course offerings in subject areas listed under *Topics* will generally vary from year to year, depending on the availability of faculty and the requirements of graduate students in the program. In the MSc program, every student must complete CHEM 666 (Seminar); in the PhD program CHEM 668 (Seminar) and CHEM 896 (Research Proposal and Comprehensive Examination) must be completed by every student. Courses are worth 3 credits unless otherwise indicated. Over the next few years the department will offer a selection of courses from those listed below. Additional *Selected Topics* courses may be offered in a given year, and these will be identified by different subtitles. Further information on *Selected Topics* courses will be available from the department at the beginning of each academic year. **Topics in Analytical & Bioanalytical Chemistry** ... **Topics in Bioorganic & Organic Chemistry** ... **Topics in Bioinorganic & Inorganic Chemistry** .... **Topics in Multidisciplinary Chemistry** **CHEM 650 Selected Topics in Multidisciplinary Chemistry** This course explores themes within the area of Multidisciplinary Chemistry. **Note:** The content will vary from term to term and from year to year. Students may re-register for this course, provided the course content has changed. Changes in content

will be indicated by a letter following the course number, e.g. CHEM 650A, CHEM 650B, etc.	will be indicated by a letter following the course number, e.g. CHEM 650A, CHEM 650B, etc.
CHEM 651 Nanochemistry *Prerequisites:* CHEM 217, 218, 221, 222, 234, 235, 241, or equivalent. This modular course covers the areas of production, characterization and applications of nanoscale structures and materials. Each module is taught by a different professor as well as guest lecturers. Topics may include (but are not limited to): size dependent properties, synthesis of organic and inorganic nanostructures, self-assembled structures, chemical patterning and functional nanopatterns, biomaterials. Nanometer scale fabrication techniques such as lithographic methods, nano-stamping and patterned self-assembly are discussed. Modern analysis techniques such as atomic force microscopy and electron microscopy, which are used to map and measure at the single molecule level are introduced. Applications such as photonics, optical properties, biodetection and biosensors, micro- and nano-fluidics, nanoelectronics and nanomachines are presented. The course includes a term project carried out using the nanoscience facilities held in the department research labs.	**CHEM 651 Nanochemistry** *Prerequisites:* CHEM 217, 218, 221, 222, 234, 235, 241, or equivalent. This modular course covers the areas of production, characterization and applications of nanoscale structures and materials. Each module is taught by a different professor as well as guest lecturers. Topics may include (but are not limited to): size dependent properties, synthesis of organic and inorganic nanostructures, self-assembled structures, chemical patterning and functional nanopatterns, biomaterials. Nanometer scale fabrication techniques such as lithographic methods, nano-stamping and patterned self-assembly are discussed. Modern analysis techniques such as atomic force microscopy and electron microscopy, which are used to map and measure at the single molecule level are introduced. Applications such as photonics, optical properties, biodetection and biosensors, micro- and nano-fluidics, nanoelectronics and nanomachines are presented. The course includes a term project carried out using the nanoscience facilities held in the department research labs. **CHEM 652 Nanomaterials Characterization** *Prerequisite:* 30 credits of CHEM courses including CHEM 293 or 335; or NANO 610. This course covers state-of-the-art nanomaterials physical characterization techniques including but not limited to: dynamic light scattering, transmission and scanning electronic microscopies (size and morphology), X-ray powder and electron diffraction (crystallinity and phase identification), Fourier transform/attenuated total reflectance infrared, Raman and X-ray photoelectron spectroscopies (surface chemical state and chemical composition), differential scanning calorimetry and thermogravimetric analysis (polymorphism, moisture content and weight loss), Brunauer–Emmett–Teller analysis (surface area), nuclear magnetic resonance (chemical bonding and nuclei interactions). Content is delivered through lectures and laboratory demonstrations.
CHEM 658 Aquatic Biogeochemistry *Prerequisite:* CHEM 217, 218, 312, or equivalent. The major aim of this course is to present a quantitative treatment of the variables that determine the composition of natural waters. Chemical equilibrium is the central theme of the course, but consideration is also given to kinetics, steady-state and dynamic models. Related themes include global chemical cycles, air and water pollution, as well as current research topics in water chemistry and chemical oceanography. Lectures only. **Note:** Students who have received credit for CHEM 618 or for this topic under a CHEM 610 number may not take this course for credit.	**CHEM 658 Aquatic Biogeochemistry** *Prerequisite:* CHEM 217, 218, 312, or equivalent. The major aim of this course is to present a quantitative treatment of the variables that determine the composition of natural waters. Chemical equilibrium is the central theme of the course, but consideration is also given to kinetics, steady-state and dynamic models. Related themes include global chemical cycles, air and water pollution, as well as current research topics in water chemistry and chemical oceanography. Lectures only. **Note:** Students who have received credit for CHEM 618 or for this topic under a CHEM 610 number may not take this course for credit. **NANO 610 Principles of Nanoscience and Nanotechnology** (6 credits) *Prerequisite:* Enrolment in the MSc/MASc in Nanoscience and Nanotechnology. This course introduces all students in the MSc/MASc Nanoscience and Nanotechnology program to the core science and engineering principles required for working at the boundary between these two nano-disciplines. It serves to ensure all students have a solid theoretical foundation in physical science and engineering principles to understand advanced topics in nanoscience and/or nanotechnology. It comprises four modules (two science-based and two engineering-based). Case studies complement lectures and provide students with a cross-section of backgrounds, disciplines and training. Emphasis is placed on collaborative work, learning to communicate across boundaries, directed learning and literature survey techniques. Course modules can include, but are not

Topics in Biochemistry **...**	limited to chemical and physical properties of materials at the nanoscale, synthesis of nanomaterials and nanostructures, nanomaterials characterization, introduction to quantum physics of nanomaterials, current limitations in nanoscience, interaction of biological systems with nanomaterials, toxicity and environmental risks of nanomaterials, environmental implications of engineered nanomaterials, nanomanufacturing, and nanotechnology at the food-energy-water nexus. **Topics in Biochemistry** **...**
Rationale: NANO 610 is a required course and CHEM 652 a program elective for students in the new MSc/MASc in Nanoscience and Nanotechnology program.	
Resource Implications: See proposal.	

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CHEM-61** VERSION: 8

PROGRAM CHANGE: Physics Course Listing

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 20xx/20xx
Implementation Month/Year: TBD 20xx

Faculty/School: Arts and Science
Department: Physics
Program: Nanoscience and Nanotechnology
Degree: MSc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[ ] Editorial [ ] Requirements [ ] Regulations [ ] Program Deletion [X] New Program

Present Text (from 2017/2018) calendar	**Proposed Text**
Courses All courses are worth 3 credits each unless otherwise specified. **PHYS 600-609 Topics in Quantum and High Energy Physics** **PHYS 630-639 Topics in Condensed Matter Physics** **PHYS 640-649 Topics in Theoretical Physics** **PHYS 660-669 Topics in Biomedical Physics** **PHYS 670-679 Topics in Applied Physics** **Topics in Quantum and High Energy Physics (600-609)**	**Courses** All courses are worth 3 credits each unless otherwise specified. The graduate courses offered by the Department of Physics fall into the following categories: **NANO 600-610 Topics in Nanoscience and Nanotechnology** **PHYS 600-609 Topics in Quantum and High Energy Physics** **PHYS 630-639 Topics in Condensed Matter Physics** **PHYS 640-649 Topics in Theoretical Physics** **PHYS 670-679 Topics in Applied Physics** **Topics in Nanoscience and Nanotechnology** **NANO 610 Principles of Nanoscience and Nanotechnology** (6 credits) *Prerequisite:* Enrolment in the MSc or MASc in Nanoscience and Nanotechnology. This course introduces all students in the MSc/MASc Nanoscience and Nanotechnology program to the core science and engineering principles required for working at the boundary between these two nano-disciplines. It serves to ensure all students have a solid theoretical foundation in physical science and engineering principles to understand advanced topics in nanoscience and/or nanotechnology. It is comprised of four modules (two science-based and two engineering-based). Case studies complement lectures and provide students with a cross-section of backgrounds, disciplines and training. Emphasis is placed on collaborative work, learning to communicate across boundaries, directed learning and literature survey techniques. Course modules can include, but are not limited to: chemical and physical properties of materials at the nanoscale, synthesis of nanomaterials and nanostructures, nanomaterials characterization, introduction to quantum physics of nanomaterials, current limitations in nanoscience, interaction of biological systems with nanomaterials, toxicity and environmental risks of nanomaterials, environmental implications of engineered nanomaterials, nanomanufacturing, and nanotechnology at the food-energy-water nexus.

.....	**Topics in Quantum and High Energy Physics (600-609)** **.....**
Rationale: NANO 610 is a required course for all students in the new MSc/MASc in Nanoscience and Nanotechnology program. Only students in the Nanoscience and Nanotechnology Masters program can take this course. NANO 600-610 Topics in Nanoscience and Nanotechnology allows for a range of nanoscience and nanotechnology courses including the newly introduced NANO 610.	
Resource Implications: The programs' resource requirements are described in the accompanying documents.	

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CHEM-61** VERSION: 8

PROGRAM CHANGE: Topic Areas

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 20xx/20xx
Implementation Month/Year: TBD 20xx

Faculty/School: Engineering and Computer Science
Department: Electrical and Computer Engineering
Program: Nanoscience and Nanotechnology
Degree: MSc, MASc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:
[X] Editorial [ ] Requirements [ ] Regulations [ ] Program Deletion [X] New Program

Present Text (from 2017/2018) calendar	Proposed Text
List of Courses by Topic Areas	**List of Courses by Topic Areas**
E37 - ENVIRONMENTAL ENGINEERING	**E37 - ENVIRONMENTAL ENGINEERING**
CIVI 6601 Modelling in Building and Environmental Engineering	**CIVI 6601 Modelling in Building and Environmental Engineering**
CIVI 6611 Environmental Engineering	**CIVI 6611 Environmental Engineering**
CIVI 6621 Engineering Aspects of Biological Treatment for Air and Water	**CIVI 6621 Engineering Aspects of Biological Treatment for Air and Water**
CIVI 6641 Unit Operations in Environmental Engineering	**CIVI 6641 Unit Operations in Environmental Engineering**
CIVI 6651 Water Pollution and Control	**CIVI 6651 Water Pollution and Control**
CIVI 6681 Environmental Nanotechnology	**CIVI 6681 Environmental Nanotechnology**
CIVI 6691 Greenhouse Gases and Control	**CIVI 6691 Greenhouse Gases and Control**
CIVI 6901 Selected Topics in Civil Engineering I	**CIVI 6901 Selected Topics in Civil Engineering I**
	E41 - Nanoscience and Nanotechnology
	NANO 610 Principles of Nanoscience and Nanotechnology
E42 - COMMUNICATIONS	**E42 - COMMUNICATIONS**
ELEC 6111 Detection and Estimation Theory	**ELEC 6111 Detection and Estimation Theory**
ELEC 6131 Error Detecting and Correcting Codes	**ELEC 6131 Error Detecting and Correcting Codes**
ELEC 6141 Wireless Communications	**ELEC 6141 Wireless Communications**
ELEC 6151 Information Theory and Source Coding	**ELEC 6151 Information Theory and Source Coding**
ELEC 6171 Modelling and Analysis of Telecommunications Networks	**ELEC 6171 Modelling and Analysis of Telecommunications Networks**
ELEC 6181 Real-time and Multimedia Communication over Internet	**ELEC 6181 Real-time and Multimedia Communication over Internet**
ELEC 6831 Digital Communications	**ELEC 6831 Digital Communications**
ELEC 6841 Advanced Digital Communications	**ELEC 6841 Advanced Digital Communications**
ELEC 6851 Introduction to Telecommunications Networks	**ELEC 6851 Introduction to Telecommunications Networks**
ELEC 6861 Higher Layer Telecommunications Protocols	**ELEC 6861 Higher Layer Telecommunications Protocols**
ELEC 6871 Fiber-Optics Communication Systems and Networks	**ELEC 6871 Fiber-Optics Communication Systems and Networks**
ELEC 6881 Fundamentals and Applications of MIMO Communications	**ELEC 6881 Fundamentals and Applications of MIMO Communications**
ELEC 7151 Broadband Communications Networks	**ELEC 6841 Advanced Digital Communications**
ENCS 6811 Optical Networking: Architectures and Protocols	**ELEC 6851 Introduction to Telecommunications Networks**

	ELEC 6861 Higher Layer Telecommunications Protocols **ELEC 6871 Fiber-Optics Communication Systems and Networks** **ELEC 6881 Fundamentals and Applications of MIMO Communications** **ELEC 7151 Broadband Communications Networks** **ENCS 6811 Optical Networking: Architectures and Protocols**
Rationale: NANO 610 is a required course for all students in the new MSc/MASc in Nanoscience and Nanotechnology program. Only students in the Nanoscience and Nanotechnology Masters program can take this course. E41 is created as a new topic area for the program.	
Resource Implications: The resources needed for this new course are included in the overall resources needed for the new program.	

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CHEM-61** VERSION: 8

COURSE CHANGE: CHEM 652 New Course Number:

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 20xx/20xx
Implementation Month/Year: TBD 20xx

Faculty/School: Arts and Science
Department: Chemistry and Biochemistry
Program: Nanoscience and Nanotechnology
Degree: MSc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	CHEM 652 ***Nanomaterials Characterization*** (3 credits) *Prerequisite:* 30 credits of CHEM courses including CHEM 293 or 335; or NANO 610. This course covers state-of-the-art nanomaterials physical characterization techniques including but not limited to: dynamic light scattering, transmission and scanning electronic microscopies (size and morphology), X-ray powder and electron diffraction (crystallinity and phase identification), Fourier transform/attenuated total reflectance infrared, Raman and X-ray photoelectron spectroscopies (surface chemical state and chemical composition), differential scanning calorimetry and thermogravimetric analysis (polymorphism, moisture content and weight loss), Brunauer–Emmett–Teller analysis (surface area), nuclear magnetic resonance (chemical bonding and nuclei interactions). Content is delivered through lectures and laboratory demonstrations.

Rationale:
It will form one of the Nanoscience option courses for the new MSc/MASc Nanoscience and Nanotechnology.

Resource Implications:
The course will be offered alternately with CHEM 451/651 (which is currently offered annually, so no resource implications for the department) and financial considerations are addressed in the proposed MSc/MASc proposal.

Other Programs within which course is listed:

None currently, but it will appear in Chemistry and Nanoscience and Nanotechnology

PROGRAM AND COURSES CHANGE FORMS FOR DOCUMENT: **CHEM-61** VERSION: 8

COURSE CHANGE: NANO 610 New Course Number:

Proposed [ ] Undergraduate or [X] Graduate Curriculum Changes

Calendar for academic year: 20xx/20xx
Implementation Month/Year: TBD 20xx

Faculty/School: Arts and Science and Engineering and Computer Science
Department: Chemistry and Biochemistry, Physics, BCEE, ECE, MIA
Program: Nanoscience and Nanotechnology
Degree: MSc
Calendar Section/Graduate Page Number: Winter 2018

Type of Change:

[ ] Course Number [ ] Course Title [ ] Credit Value [ ] Prerequisite
[ ] Course Description [ ] Editorial [X] New Course
[ ] Course Deletion [ ] Other - Specify:

Present Text (from 20xx/20xx) calendar	**Proposed Text**
	NANO 610 Principles of Nanoscience and Nanotechnology (6 credits) *Prerequisite:* Enrolment in the MSc or MASc in Nanoscience and Nanotechnology. This course introduces all students in the MSc/MASc Nanoscience and Nanotechnology program to the core science and engineering principles required for working at the boundary between these two nano-disciplines. It serves to ensure all students have a solid theoretical foundation in physical science and engineering principles to understand advanced topics in nanoscience and/or nanotechnology. It comprises four modules (two science-based and two engineering-based). Case studies complement lectures and provide students with a cross-section of backgrounds, disciplines and training. Emphasis is placed on collaborative work, learning to communicate across boundaries, directed learning and literature survey techniques. Course modules can include, but are not limited to chemical and physical properties of materials at the nanoscale, synthesis of nanomaterials and nanostructures, nanomaterials characterization, introduction to quantum physics of nanomaterials, current limitations in nanoscience, interaction of biological systems with nanomaterials, toxicity and environmental risks of nanomaterials, environmental implications of engineered nanomaterials, nanomanufacturing, and nanotechnology at the food-energy-water nexus.

Rationale:
This is a required course for all students in the new MSc/MASc in Nanoscience and Nanotechnology program. Only students in the Nanoscience and Nanotechnology Masters can take this course.

Resource Implications:
The resources needed for this new course are included in the overall resources needed for the new program.

Other Programs within which course is listed:

None.

APPENDICES

Appendix 1 Letter of support

Appendix 2 Library report

Appendix 3 Student Survey

Appendix 4 Memo introducing proposed new course CHEM 652 and course outline

PÔLE RECHERCHE INNOVATION MATÉRIAUX AVANCÉS

Le 29 aout 2016

Monsieur Graham Carr
Vice-recteur à la recherche et aux études supérieures,
et Vice-recteur exécutif aux affaires académiques par intérim
Université Concordia
1455, rue Sainte-Catherine Ouest
Montréal (Québec) H3C 1M8

Objet : Appui au projet *Research-based master's in nanoscience and nanotechnology (NSNT)*

Monsieur,

Pour faire suite à nos échanges, vous nous avez informés de la mise sur pied d'un programme de maitrise en Nanoscience et nanotechnologie (NSNT). L'objectif de ce programme est de former des chercheurs compétents en NSNT en leur fournissant une expérience forte dans la recherche (thèses et publications), combiné avec des compétences en recherches appliquées, c'est-à-dire de développer la capacité à travailler sur des projets de recherches appliquées en équipes multidisciplinaires. La récente création du Pôle de recherche et d'innovation en matériaux avancés (PRIMA QUÉBEC) confirme la volonté de gouvernement du Québec (MESI) de se doter d'une infrastructure forte dans le domaine des matériaux avancés.

Selon la stratégie pour l'innovation américaine parue en octobre 2015, le secteur des nanotechnologies est identifié comme technologie émergente de masse (emerging general-purpose technolgies). Une technologie qui aura un impact très important sur l'économie et la société. Elle créera de nouvelles industries, stimulera la création des emplois et augmentera la productivité.

Des initiatives se multiplient, partout en Amérique du Nord, supportée par les divers paliers gouvernementaux, afin de faciliter la recherche et la commercialisation des nanotechnologies. Des programmes de collaboration entre universités, centres de recherche et les industries, des accès à des bases de données ou de l'aide pour faciliter le transfert technologique ne sont que quelques exemples.

Plusieurs études démontrent qu'au niveau mondial :

- La production de produits incorporant les nanotechnologies devrait atteindre plus de 3 MM $ US d'ici 2018.
- Le marché mondial des nanotechnologies devrait croitre de 64,2 MM $ US d'ici 2019.
- Les États-Unis dominent en nanostructure alors que le Canada excelle dans les projets de recherche et de développement et en éducation.

La tendance est que les produits ayant le plus de valeur dans le marché et auprès des investisseurs sont ceux améliorant la force et diminuant le poids. Afin d'innover en ce sens, avoir accès à des chercheurs et de la main d'œuvre compétent en recherche et développement est un incontournable.

505, boulevard de Maisonneuve Ouest, bureau 225 Montréal Québec H3A 3C2
Téléphone : (514) 284-0211 – info@prima.ca

Les objectifs de votre programme de maitrise NSNT rejoignent ceux poursuivis par notre organisation, comme entre autres :

Soutenir l'innovation collaborative

- Promouvoir et financer l'innovation collaborative en matériaux avancés
- Accélérer la diffusion des résultats de recherche académique dans l'industrie
- Contribuer à la formation de personnel hautement qualifiée

Mobiliser l'ensemble de la communauté

- Dynamiser les interactions entre le milieu académique et l'industrie
- Accroitre le développement économique par l'innovation ouverte et collaborative

PRIMA QUÉBEC souhaite que votre projet de maitrise NSNT se concrétise, car l'émergence des nanotechnologies est bien réelle et les besoins industriels seront grandissants. Par notre mission, nous contribuons à mettre en avant la recherche et le développement de nouveaux matériaux d'avenir et leurs procédés de mise en forme. L'innovation technologique demeure une préoccupation constante et les travaux de R-D menée par les industriels nécessitent une infrastructure de recherche et de formation telle que l'université Concordia le propose.

Nous appuyons donc ce projet qui constitue, quant à nous, une avancée importante pour l'éco système d'innovation au Québec.

Veuillez agréer, Monsieur, l'expression de mes sentiments distingués.

Le Président du conseil d'administration,

Pierre Lapointe

Library Report

For the Proposed

Masters in Nanoscience and Nanotechnology

Prepared by Krista Alexander
Physics and Chemistry & Biochemistry Librarian

Created: June 2016

Purpose

The purpose of this report is to assess the adequacy of available library resources to support the proposed multidisciplinary Masters in Nanoscience & Nanotechnology program. Although a nanoscience and nanotechnology course is currently offered at Concordia, Concordia has no pre-existing undergraduate program in this area.

Monographs

To assess the relative strength of Concordia University Libraries' monograph collection in terms of the research needs of the proposed Masters program, collection size was measured for a sample of relevant Library of Congress Subject Headings. Concordia's monograph collection in these subject areas was compared with those of three other universities that also offer a Masters program in Nanoscience, Nanotechnology, or Nano Engineering. The comparators, identified by the Department of Electrical and Computer Engineering, include the University of Waterloo, UC San Diego, Louisiana Tech University, North Dakota State University, University of New Mexico and SUNY Polytechnic Institute. North Dakota State University, Louisiana Tech University and SUNY Polytechnic Institute were not included in the comparison due to significant differences in total institutional enrollment when compared to Concordia University. The results are presented in **Table 1**.

Table 1: Comparative Size of Monograph Collections for Selected Subject Areas

LC Subject Heading	Number of Monograph Titles			
	Concordia	University of Waterloo/TUG*	UC San Diego	University of New Mexico
Condensed matter	115	289	140	302
Integrated circuits very large scale integration	366	245	138	622
Nanobiotechnology	13	17	23	6
Nanochemistry	15	45	57	19
Nanocomposites materials	24	75	73	58
Nanocrystals	21	23	19	32
Nanoelectromechanical systems	24	35	41	34
Nanoelectronics	58	80	76	87
Nanolithography	1	3	3	4

LC Subject Heading	Number of Monograph Titles			
	Concordia	University of Waterloo/TUG*	UC San Diego	University of New Mexico
Nanomanufacturing	2	3	4	6
Nanomedicine	48	96	97	50
Nanoparticles	91	122	114	148
Nanophotonics	35	47	48	33
Nanoscience	54	97	100	372
Nanostructured materials	360	603	621	479
Nanostructures	65	163	148	221
Nanotechnology	449	773	678	820
Nanotubes	45	88	69	88
Nanowires	7	31	30	25
Quantum dots	20	46	42	84
Quantum theory	959	2201	1293	2018
Quantum wells	8	37	40	90
Solid state physics	159	312	231	293
Total:	2939	5431	4085	5891

*It should be noted that the values for the University of Waterloo monograph collection are an overestimate of the actual monograph content available to University of Waterloo students. This is a result of two search limitations within the University of Waterloo Library's online catalogue. As a part of the Tri-University Group (TUG) of institutions (University of Waterloo, Wilfred Laurier University and the University of Guelph), University of Waterloo students have access to print books at both the University of Guelph and Wilfred Laurier University libraries. However, the online catalogue did not allow for specific material types (monographs versus periodicals for example) and institutional holdings (University of Waterloo versus University of Guelph for example) to be parsed out. Due to the University of Waterloo's engineering focus in comparison to both Wilfred Laurier University and the University of Guelph, it was assumed that the largest portion of the items retrieved in the subject search would come from Waterloo, but the two search limitations described lead to an inaccuracy and potential overestimate of the items available to University of Waterloo students.

Concordia's monograph collection related to nanoscience and nanotechnology is significantly smaller than those at the comparative universities. Considering that the University of Waterloo figures are potential overestimates, and that the University of New Mexico has six branch campuses, it was decided that UC San Diego would be the best monograph comparator. This therefore points to a monograph collection which is unsupported by approximately 28%. Future improvements to the collection should be made by purchasing more books with various subject headings, including (but not limited to), "Nanostructured materials", "Nanostructures", "Nanotechnology" and "Quantum wells".

While there is no historical data on which to base an assessment of collection growth over time at Concordia, the library materials budget for monographs in the five relevant subject areas covered by this proposed program are shown for the last five years in Table 2.

Table 2: Library Materials Budget for Monographs in Physics, Chemistry & Biochemistry, Electrical and Computer Engineering, Mechanical Engineering, and Building, Civil and Environmental Engineering

Year	Physics Appropriation	Chemistry & Biochemistry Appropriation	Electrical and Computer Engineering Appropriation	Mechanical Engineering Appropriation	Building, Civil and Environmental Engineering Appropriation
2011-12	$8755	$14,636	$36,720	$26,826	$30,600
2012-13	$6128	$11,000	$25,811	$18,778	$21,420
2013-14	$3677	$6600	$15,487	$11,267	$12,852
2014-15	$3677	$6600	$15,487	$11,267	$12,852
2015-16	$3677	$6600	$15,487	$11,267	$12,852

Despite the reduction in monograph funds over the years, Concordia Libraries have been able to acquire a number of electronic book collections using some centralized (non-subject specific) funds as well as money from the Academic Plan. Electronic book collections bought using these funds include Springer Ebooks, the IEEE Xplore Digital Library, the IEEE-Wiley Ebooks Library, the MIT Press eBooks Library, and ScienceDirect Ebooks. Each of these collections includes materials relevant to Nanoscience and Nanotechnology which are normally updated each year with new titles.

Additionally, one-time monies (known as development funds) are sometimes made available each year to support new programs or build specific areas of the library collection in answer to the changing needs of our community. These funds can be used to expand the monograph collection, and also allow the Libraries to acquire more expensive items such as handbooks and standards.

Finally, graduate students at Concordia University benefit from services that provide access to collections outside of Concordia, including the BCI card, which allows for direct borrowing of books from other Canadian academic libraries, including major Montreal institutions such as McGill University and Montréal Polytechnique. Also available is the Libraries' Interlibrary Loans service, which allows users to obtain books, articles and conference papers from other institutions worldwide that are not accessible at Concordia.

Electronic Resources (Databases)

Concordia University Libraries' collection of databases relevant to the field of Nanoscience and Nanotechnology is quite complete and comparable, if not better, to other universities offering similar programs. In the Libraries' collection, the three most important databases for Nanoscience and Nanotechnology, which provide access to indexed abstracts or full-text articles, are the following:

IEEE Xplore
IEEE Xplore provides access to citations, abstracts, and full-text of articles published in the journals, transactions, and conference proceedings of the Institute of Electrical and Electronic Engineers (IEEE) and of the British-based Institution of Electrical Engineers (IEE) from 1988 onwards. The database features many publications in nanoscience and nanotechnology, including IEEE Transactions on Nanotechnology, IET Nanobiotechnology, and IEEE Nanotechnology Express. Among over 300 conference publications are the International Conference on Nanoscience and Nanotechnology, Nanotechnology Materials and Devices Conference, and the IEEE Conference on Nanotechnology. Of note, current IEEE standards are also available in the database.

SciFinder
SciFinder searches Chemical Abstracts which indexes a wide range of international literature in chemistry and related fields (biology, engineering, physics, geology and material sciences). SciFinder Includes journal articles, patents, dissertations, conference proceedings. It also contains millions of substances (CAS Registry) and reactions (CAS REACT), which can be searched by chemical structure, reactions, formulas or CAS Registry numbers. Commercial and regulated chemical information is included.

INSPEC
This database covers research literature, going back to 1896, in physics, electrical engineering, electronics and computing, as well as manufacturing, production and mechanical engineering.

Other important databases in the Libraries' collection which provide access to Nanoscience and Nanotechnology literature include:

Compendex
Compendex database is the definitive source of engineering information covering the engineering research literature since 1884. A bibliographic database with references to more than 5,000 engineering journals and conferences.

Computers & Applied Sciences Complete
This is a full-text article database that covers academic journals, professional publications, and other reference sources in the applied sciences. Subject areas include many engineering disciplines, computer theory and systems, and new technologies.

Scopus
This multidisciplinary database covers journals and conference proceedings in science and technology. The physical sciences comprise 29% of the database.

Web of Science
This multidisciplinary database covers the journal literature of the sciences through the Science Citation Index (1979 – onwards), which includes the fields of science and engineering. Coverage also includes conference proceedings from the Conference Proceedings Citation Index (1990 – onwards).

Journals

The Libraries have a substantial collection of electronic journals, which are usually acquired in bundles, either from the publisher or an aggregator. These subscription bundles, generally managed on a provincial or national level through academic library consortia, include journals relevant to Nanoscience and Nanotechnology. These electronic subscriptions have displaced the print journal collections, and are available to Concordia researchers on- and off-campus. The relevant subscription bundles for Nanoscience and Nanotechnology include (but are not limited to): Elsevier (ScienceDirect), IEEE, IOP, ACS, RSC, APS, Sage, Springer, Taylor & Francis, and Wiley-Blackwell.

Below is a list of 25 key nanoscience and nanotechnology journals, ordered by their 5 year impact factor according to *ISI's Journal Citation Report*, and the Libraries' current holdings for these journals, along with holdings at the comparator institutions noted above in the monograph analysis.

Table 3: Print and/or electronic holdings of 25 high impact factor nanoscience and nanotechnology journals for Concordia University, University of Waterloo, UC San Diego, and University of New Mexico.

Title (publisher or aggregator)	5-year impact factor	Concordia University	University of Waterloo	UC San Diego	University of New Mexico
Nature Nanotechnology	40.632	Oct 2006-Present	2012-Present	2006-Present	2006-Present
Nano Today	19.098	Feb 2006-Present	Feb 2006-Present	2006-Present	Feb 2006-Present
Advanced Materials	18.862	1994-95 Jan 1998-Present	1997-Present	1989-Present	1998-Present
Nano Letters	14.867	Jan 2001-Present	Jan 2001-Present	2001-Present	2001-Present
ACS Nano	14.486	Aug 2007-Present	Aug 2007-Present	2007-Present	Aug 2007-Present
Nano Energy	12.272	Jan 2012-Present	2012 - Present	2012-Present	2012-Present
Advanced Functional Materials	11.774	Jan 2001-Present	2001-Present	2001-Present	2001-Present
Nano Research	9.274	Jan 2008-Present	July 2008-Present	July 2008-Present	2008-Present
Small	8.375	Jan 2005-Present	Jan 2005-Present	Jan 2005-Present	2005-Present
Nanotoxicology	8.137	Mar 2007-Dec 2014	Mar 2007-Present	Mar 2007 - 18 months ago	Mar 2007- 18 months ago
Nanoscale	7.915	Jan 2009-Present		Oct 2009-Present	
Journal of Physical Chemistry Letters	7.803	Jan 2010-Present	Jan 2010-Present	Jan 2010-Present	Jan 2010-Present
ACS Applied Materials & Interfaces	7.332	Jan 2009-Present	Jan 2009-Present	Jan 2009-Present	Jan 2009-Present
Nanomedicine-Nanotechnology Biology and Medicine	6.922	Mar 2005-Present	Mar 2005-Present	Mar 2005-Present	Mar 2005-Present
Biosensors & Bioelectronics	6.675	1994-Present	1990-Present	1990-Present	1999-Present
Advanced Science	6.400	Open Access	Open Access	Open Access	Open Access
Nanomedicine	6.083				2006 - 12 months ago
Advanced Healthcare Materials	6.019			Jan 2012-Present	
Environmental Science-Nano	5.896		Feb 2014-Present		
Lab on a Chip	5.760	Jan 2001-Present	2001-Present	Sept 2001-Present	2001-Present

Title (publisher or aggregator)	5-year impact factor	Concordia University	University of Waterloo	UC San Diego	University of New Mexico
ACS Photonics	5.404	Jan 2015-Present		Jan 2014-Present	
Nanophotonics	5.372	Open Access	Open Access	Open Access	Open Access
International Journal of Nanomedicine	5.034	Open Access	Open Access	Open Access	Open Access
Journal of Physical Chemistry C	4.919	Jan 2007-Present	2007-Present	2007-Present	Jan 2007-Present
Wiley Interdisciplinary Reviews-Nanomedicine and Nanobiotechnology	4.507				

Overall, Concordia has current access to 20 out of the 25 publications and backfile access to 21 out of the 25 publications as well. The collections are very similar for all universities.

Recurring Library Collection Expenditures

To fully support this proposed Masters program in Nanoscience and Nanotechnology, certain areas of Concordia Libraries' collection should be enhanced. The current Concordia Libraries' journal and database collections are adequate to support the proposed program, however, the proposed program is estimated to be unsupported by the monograph collection at 28%. To take into account the fact that Masters science and engineering students are likely to be primarily reliant on journal literature, not monographs, the amount by which the collection is unsupported was reduced from 28% to 23%.

As per Section 5 of the document ***How to Calculate Revenues & Expenses for New Courses and New Programs***, prepared by the Resources Committee, the weighting grid for Cycle 2 in the Pure Sciences is 6.59 and the weighting grid for Cycle 2 in Engineering is 4.42. The multidisciplinary nature of the proposed program makes it necessary to use each of these values to determine a range of recurring library collection expenditures. Each of these numbers was multiplied by 10,000 (see Section 5 the document mentioned above) and further multiplied by 23% (the amount by which the collection is considered to be unsupported). The recurring library collection expenditures would then fall between $10,166 and $15,157.

Please indicate your current program of study.

Please indicate your current program of study.			
	Counts	Percents	Percents 0 100
Mechanical Engineering	34	21.9%	
Biology	29	18.7%	
Electrical Engineering	27	17.4%	
Biochemistry	17	11.0%	
Building Engineering	12	7.7%	
Chemistry	9	5.8%	
Physics	9	5.8%	
civil engineering	9	5.8%	
Cell and Molecular Biology	5	3.2%	
Building	1	0.6%	
Building eng.	1	0.6%	
CIVI ENGINEERING	1	0.6%	
Computer Engineering	1	0.6%	
Other	0	0.0%	
Totals	155	100.0%	
Mean	--		

Please indicate your level of study.

Please indicate your level of study.			
	Counts	Percents	Percents 0 100
Bachelor's degree	121	78.1%	
Master's degree with thesis	21	13.5%	
Master's degree without thesis	13	8.4%	
Ph.D.	0	0.0%	
Other	0	0.0%	
Totals	155	100.0%	
Mean	--		

Please indicate the number of credits left in your degree

Please indicate the number of credits left in your degree			
	Counts	Percents	Percents 0 100
0 to 20	61	46.2%	
20 to 40	50	37.9%	

[Continuing table]

Please indicate the number of credits left in your degree			
	Counts	Percents	Percents 0 100
40 to 60	19	14.4%	
Other	2	1.5%	
Totals	132	100.0%	
Mean	22.99		

Based on this description, how likely is it that you would apply to the Master's program in N...

Based on this description, how likely is it that you would apply to the Master's program in Nanoscience and Nanotechnology if it became available?			
	Counts	Percents	Percents 0 100
Very likely	39	25.2%	
Likely	36	23.2%	
Somewhat likely	41	26.5%	
Unlikely	30	19.4%	
Do not know	9	5.8%	
Totals	155	100.0%	
Mean	3.43		

In what year would you most likely expect to apply to the Master's program in Nanoscience and...

In what year would you most likely expect to apply to the Master's program in Nanoscience and Nanotechnology?			
	Counts	Percents	Percents 0 100
2013	65	43.0%	
2012	33	21.9%	
Later	33	21.9%	
2014	20	13.2%	
Totals	151	100.0%	
Mean	--		

What area(s) of specialization interest you?

What area(s) of specialization interest you?			
	Counts	Percents	Percents 0 100
Nanobiosystems	46	30.3%	
Nanomaterials	43	28.3%	
Nanodevices	26	17.1%	
Nanoelectronics	24	15.8%	
All of the above	1	0.7%	
Both nanoelectronics and nanodevices	1	0.7%	
Controls, effecient energy transfer for developing environments	1	0.7%	
Energy engineering	1	0.7%	
Enzyme kinetics	1	0.7%	
MEMS	1	0.7%	
nanobiosystems and nanodevices aiming for the field of neurology	1	0.7%	
nanomaterials and photovoltaics, for example, Quantum dot solar panels.	1	0.7%	
Nanotoxicology of Industrial Products	1	0.7%	
None	1	0.7%	
Quantum Computing	1	0.7%	
Other	2	1.3%	
Totals	152	100.0%	
Mean	--		

Are the proposed program objectives relevant to your academic and professional goals?

Are the proposed program objectives relevant to your academic and professional goals?			
	Counts	Percents	Percents 0 100
Very relevant	43	27.7%	
Relevant	78	50.3%	
Not relevant	20	12.9%	
Don't know	14	9.0%	
Totals	155	100.0%	
Mean	2.97		

[Program Objectives]: If you responded "Not relevant" or "Don't know", please explain your ch...

If you responded "Not relevant" or "Don't know", please explain your choice.

- I never read anything about Nanotechnology being applied to building science, but I can see it being used to alter materials to optimize its functions + characters.
- As a building engineer, it would be of relevance if this technology can be applied to simplify HVAC controls, sensors and various other devices
- As a Civil Engineering student, I have only considered using nanofiltration membrane technology for my waste water treatment design, and I would like to learn more about this as an Environmental engineer. I think my goal is relevent to the program objectives but not sure.
- I am interested in a completely seperate field of science
- I'm not sure how relevant this would be for a building engineer, in the practical sense. Perhaps if I were more interested in research and developing new building products it could of more interest.
- It should not become so widespread as too many introductory courses would take away from the appeal of the program.
- I have not yet decided on a particular path of biology to continue my studies in.
- Since I have already chosen a M.A.Sc., my goals are different, however, if this program were available in the past (before my current degree) I would have heavily considered it as it appears very worthwhile.
- Not directly related to space engineering, so, hard to say.
- Not interested in this program
- I am uncertain at this point how such training would align with biology and microbiology - my ultimate choice for graduate studies.
- I'm not interested in pursuing nanotechnology in my career.
- I already have a Masters degree in Biomedical Eng, Nanotechnology from McGill so I would unlikely pursue another masters in the same discipline. But I do think its an excellent idea to have this new discipline and I am sure a lot of students will be motivated to pursue studies in this field.
- My back ground is Mechanical Eng. I am in Building Master degree in building science and project management. I am not sure and don't know the relation between the Nano and project management program.
- my area is about structure
- I don't even know what this is
- I want to become a biology teacher for highschool
- I'm not familiar with this field at all.
- This is not something I am familiar with
- As a civil engineer, I cannot think of nanotech applications within my field.
- Will be entering in the MBA program to ultimately manage construction sites
- My professional goals are to work in a domain related to renewable energy; somewhere where I feel that I am having a positive impact on our planet and the people living on it.

Are the proposed courses relevant to your academic and professional goals?

Are the proposed courses relevant to your academic and professional goals?			
	Counts	Percents	Percents 0 100
Very relevant	34	21.9%	
Relevant	82	52.9%	
Not relevant	31	20.0%	
Don't know	8	5.2%	
Totals	155	100.0%	
Mean	2.92		

[Courses]: If you responded "Not relevant" or "Don't know", please explain your choice.

If you responded "Not relevant" or "Don't know", please explain your choice.

- MY PROFESSIONAL GOALS ARE TO BE A CONSTRUCTURE ENGINEER.
- I do not have any idea about the courses offered since they do not touch directly the civil engineering approach.
- I am a biology student, and as such, while these courses may have applications in my field, they are not directly and evidently applicable.
- Too much chemistry!
- I am more interested in biological sciences and this seems to be more chemistry and engineering based.
- I am researching cognitive networks
- As before, I haven't decided what exactly I want to do however the course options are quite interesting and I would be interested in the nanochemistry option.
- My current goals do not include nanoscience or nanotechnology, however, I do beleive that this degree should be realized.
- Not interested in the program
- Same as previous question.
- these are courses i'd be highly underqualified for, though they are interesting.
- I am currently applying to medical and pharmacy schools so this area is no longer a part of my short-term career goals, but maybe in the future if I decided to do research as well.
- I'm interested in Construction and building engineering at the macroscopic scale.
- My focus would be on the toxicological aspects of the nanoparticles in the different phases of their development to aid in the formulation of industrial processing.
- civil eng. - structure
- Not interested
- Again, once I'm done my biology degree I'll be going to teachers college then teaching
- Again, it's not really my domain.
- As before, am a civil engineer, can't think of applications.
- As mentioned previously, my field of study is Building Engineering and the previous list did not include any of the nanotechnology at the building engineering level
- Will be working in construction sites
- My professional goals are to work in a domain related to renewable energy; somewhere where I feel that I am having a positive impact on our planet and the people living on it. These course don't match with my goals

How do you see this program contributing to your academic and professional goals? (please ch...

How do you see this program contributing to your academic and professional goals? (please check all that apply)			
	Counts	Percents	Percents 0 100
It is an emerging field and I feel it will become very important in the future.	121	78.6%	
It can improve my research academic skills for higher studies.	71	46.1%	
It will increase my employment prospects.	68	44.2%	
It sounds cool and I feel like doing it.	44	28.6%	
Don't know.	11	7.1%	
Totals	*	*	
Mean	--		

* Note: Multiple answer percentage-count totals not meaningful.

Do you have any final comments or questions regarding the proposed master's degree in Nanosc...

Do you have any final comments or questions regarding the proposed master's degree in Nanoscience and Nanotechnology?

- You should include some subjects that are related to the civil engineering program. It is more an electrical and mechanical engineering approach, which makes it harder for civil engineering to find its own interests in this master's program.
- This technology has been used in the medical field for a bit of time now and with the ability to make objects smaller, we can increase the level of accuracy and precision within all fields of study, not just mechanical.
- Go for it. The future is small. Think of the dinosaurs :). But in all seriousness it seems to be an emerging field with many job prospects creeping up, plus it's really cool.
- Sounds pretty awesome. I feel that degrees with interdisciplinary aspects are quite valuable!
- I think this new program is partially related to the environmental engineering, which is what I prefer to learn in my graduate studies. Since in Concordia, the Environmental Engineering is under the Civil Engineering program, I expect more courses are offered by Civil Engineering department, but there is none of them on the list. I am confusing now: is that means this program is unrelated to the Civil Engineering at all?
- I would be very intersted in applying for this program should it become available. The nanochemistry course currently available (CHEM 451) was very interesting and only sparked my interest for more!
- I am strongly agree with inauguration the program which can better assimilate various ideas in different sciences and thecnologies.
- Do biochem students need to have engineering experience or can they just get into it?
- I was eagerly waiting for Concordia to take this step as I was feeling lost at the end of completing my mechanical engineering degree. I always wanted to pursue nanotechnology but from an engineer's point of view. This program will benefit lot of other engineer's who want to advance in their careers in the field of nanotech. We are not far from the era when everything will be built up right from the nanoscale and as the technology exists, all we need is an institute like Concordia to make us explore this field of science. I m not an A student but this field can make me an A student with all the interest I have. Looking forward to Concordia to make this happen !!!
- It is a great field of study.
- It sounds like a very interesting field, but I am too deep in my research to change.
- I am a graduating student this semester and when I saw this email I thought to myself: this kind of research I would like to try out. The problem is I don't think it will be made available in the fall and I worry that I may end up losing the chance to go into the program because of this.
- I'd like to see more emphasis on its applications to sustainability.
- I and other students interested in these studies are unaware of what employment opportunities will be like.
- Although I don't think I will enroll (as I'm already enrolled in a M.A.Sc. program) I think that this program should be offered.
- Would this be open to student who only posses a chemistry background as it sound like the degree would be very heavy in engineering class?
- It is an interesting program proposal but this survey does not ask about it
- The program should include a mandatory class in nano-toxicology (also an exciting emerging field of research:).
- great idea for a new genre of academia at Concordia university!
- It is exciting to have such a program being offered only at Concordia (in Quebec) and this is the right direction to be heading in.
- Which GPA is required to enter the program ?
- i will gladly apply for this proposed master's degree
- Nanotechnology is a field with many unknown/unexplored fields and it would be unfortunate if one were to get a Master's degree in something that is still not full understood.
- I think it is a very good idea to offer such a program as it is indeed an emerging field that could possibly/probably push our technology to a new level. It also happens to be a very interesting program that I believe could potentially attract many applicants.
- I am looking forward for an opportunity to enter in the program
- Is a biology undergrad enough to prepare for a graduate degree in nanoscience/nanotechnology?
- How soon would students know if the proposed degree has become available?
- I think Concordia should implement this program. Nanotechnology will be a very important field academically and in the industry, so I think it would attract a lot of students.
- I would like to see projects and applications of Nanotechnology, and for that to be the center of the course loads.
- Scholarships and funds should be available specially for women and international students
- I am graduating from biology this semester, and it is my intention to pursue a career in a field closely related to the program that is being proposed here. Unfortunately, as Concordia does not yet offer anything BioMechanically or BioElectrically related, I will need to seek schooling elsewhere. My intentions are to do a second Bachelor's in Engineering, and it would have been nice to 4th-year specialize in a biology-related field in an English university in Quebec, but nothing in this field is offered here so I must look out of province or internationally. I am glad this is being considered now, it will be an innovative step for Concordia.
- You can couple it with a toxicology masters in the biochemistry department.

- It's great that Concordia is future-proofing itself (at least in this domain) by considering to bring this program to students.
- Great idea, extremely interesting, and I believe extremely useful as an option.
- concordia should have this field
- Date of implementation?
- I don't know if it's viable but an internship with a company using nanotechnology would be interesting. If not, maybe some lab work to get hands on experience building nano devices would be beneficial.
- SOME OF THE CLASSES SEEM INTERESTING IN BOTH OPTIONS. IT WOULD BE BENEFICIAL TO OFFER PROGRAMS THAT INCLUDE BOTH ASPECTS (NANOSCIENCE AND NANOTECHNOLOGY). FURTHERMORE, SOME INDUSTRY INVOLVEMENT MAY BE BENEFICIARY IN THAT IT WOULD BRING IN SOME INDIVIDUALS THAT WOULD BE WILLING BUT NEED THAT LITTLE EXTRA PUSH.
- The program seems very interesting; however, I am not sure of the job opportunities that a prospective student would get once he/she has finished the Msc. I would like to inquire if there are any jobs in the Montreal Region (Region Metropolitaine) that would be attainable with a Msc. in nanotechnology (industry-wise).
  Thank you.
- It would not be my first choice, however i think it is a great idea and encourage you to go through with it.
- Concordia should push for a medicine program in my opinion. Even with a cohort as small as 50 students, it would enhance the university reputation, and I would have been able to stay at Concordia after my degree.
- What will the GPA requirement be? Also, will Concordia graduates have a priority in application?
- I am already applying to similar graduate level nanotech programs at other universities.
- This would be a step forward for Concordia, showing Canada that it wants to be a leader.
- Please commence this brilliant program ASAP
- It would also be interesting to offer courses or options where we can apply nanoscience and nanotechnology for the understanding of the brain or improving anything that already exists. However, I find that the idea of offering this program to be incredible and allow Concordia University make a more profound mark next to its competitors.
- It's the field of the future and it will open a lot of doors for students whom are interested, such as myself.
- Graduate studies in this growing and omnipresent field is a must, in my opinion. Look fowrard to it.
- Only 4 courses doesn't seem like a lot...

APPENDIX 4

INTERNAL MEMORANDUM

TO: Paul Joyce, Associate Dean Curriculum, Faculty of Arts and Science

FROM: Christine DeWolf, Chair, Department of Chemistry and Biochemistry

DATE: 4 May 2017

SUBJECT: **New CHEM course for MSc/MASc Nanoscience and Nanotechnology**

The Department of Chemistry and Biochemistry has been part of a larger group comprising two FAS Departments (Physics and Chemistry & Biochemistry) and 3 ENCS Departments to create a new, interdisciplinary, cross-faculty thesis-based MSc/MASc in Nanoscience and Nanotechnology. The details of the proposed new program are described in a separate proposal. Within the context of this proposed new program, graduate students will need to select two electives from a nanoscience and nanotechnology list. The nanoscience option courses will comprise two physics course options and two chemistry course options. With respect to the latter, the Department of Chemistry and Biochemistry already offers CHEM 651 Nanochemistry (cross-listed with CHEM 451). Herein we request to add the second course (CHEM 652 Nanomaterial Characterization) to the Chemistry and Biochemistry graduate calendar to meet our obligations for providing nanoscience option courses for this program.

The course would be offered in alternate years (CHEM 651 is currently offered annually) so there are no resource implications for this course. Additionally, the course would be available to students registered in our own MSC Chemistry and PhD Chemistry programs, providing greater course options in nanoscience, essential given the strength of the department in this research area. Additionally, we propose to add CHEM 452 as a cross-listed undergraduate version of the same course to benefit our BSc Honours and Specialization students and attract them into this highly topical research field. The proposed course outline is also attached.

The MSc/MASc Nanoscience and Nanotechnology program was approved at a Departmental meeting on March, 6 2017.

CHEM 452/652 – Nanomaterials Characterization – Fall 20XX – 3 credits

1. GENERAL INFORMATION

Course Format Lectures: Total of 2h30 / week **Day** **Time**
Classroom # LOY

Instructor Dr. Rafik Naccache SP–265.20 ext. 3279
Office hours: by appointment
rafik.naccache@concordia.ca

2. COURSE DESCRIPTION

This course covers state-of-the-art nanomaterials physical characterization techniques including but not limited to: dynamic light scattering, transmission and scanning electronic microscopies (size and morphology), X-ray powder and electron diffraction (crystallinity and phase identification), Fourier transform/attenuated total reflectance infrared, Raman and X-ray photoelectron spectroscopies (surface chemical state and chemical composition), differential scanning calorimetry and thermogravimetric analysis (polymorphism, moisture content and weight loss), Brunauer–Emmett–Teller analysis (surface area), nuclear magnetic resonance (chemical bonding and nuclei interactions). Lectures only and laboratory demonstrations.

Prerequisite courses: 30 Credits in CHEM including CHEM 293 or CHEM 335

3. OBJECTIVES

To provide a solid knowledge of state-of-the-art characterization techniques for nanomaterials.

4. SCHEDULE and OUTLINE

Chapter topic	*A glimpse of the lecture content*
I. Size and Morphology	Dynamic light scattering, scanning and transmission electron microscopies
II. Crystallinity and Phase Identification	Single-crystal, X-ray powder and electron diffraction techniques
III. Surface Characterization	Fourier transform infrared, Raman and X-ray photoelectron spectroscopies
IV. Thermal analysis	Differential scanning calorimetry and thermogravimetric analysis
V. Surface Area	Brunauer–Emmett–Teller analysis
VI. Bonding and Nuclei Interactions	^{1}H NMR, ^{13}C NMR, solid-state NMR

5. MATERIAL

Recommended Texts
- In-class lecture slides and the references contained within
- "A Laboratory Course in Nanoscience and Nanotechnology"

(CRC Press) - Gerrard Poinern
- “Materials Characterization Techniques” (CRC Press) - Zhang, Li, Kumar

6. COURSE FORMAT and GRADING

The final grade will be weighted and calculated as follows:

Mid-term: **30%**
Oral Presentation (15 min.): **20%**
Final Exam: **50% (during the exam period)**

A grade ≥	0%	50.00	53.33	56.67	60.00	63.33	66.67	70.00	73.33	76.67	80.00	85.00	90.00
and <	50.00	53.33	56.67	60.00	63.33	66.67	70.00	73.33	76.6	80.00	85.00	90.00	100%
gets a:	F	D–	D	D+	C–	C	C+	B–	B	B+	A–	A	A+

To pass CHEM 452/652, you must obtain at least 50% on the coursework overall.

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

If absent from an examination, you must produce a written excuse on letterhead paper appropriately signed (e.g., by a doctor or employer) within one week after the exam. The Department determines the validity of the absence and necessary arrangements will be made. If no valid excuse is produced, the student will receive a **zero** grade for the missed work.

MIDTERM
The midterm will take place during lecture time. A 75-minute period will be allocated towards the completion of the midterm.

ORAL PRESENTATION

Every student is required to present a topic related to the course subject in an oral presentation to the class. The presentation shall not exceed 15 minutes and will be followed by questions from the class. The goal is to cover specific subjects in more detail than will be done during the lectures. The presentation shall address both fundamental <u>and</u> applied aspect(s) of a course-relevant topic. The instructor will propose a list of topics during class; however, students can also propose topics if they so desire. The students are required to provide the instructor with an **outline** of their presentation **1 week** prior to the presentation. This outline is destined at assessing the progress on literature research related to the topic that will be presented orally. The presentations will be graded based on quality of content, presentation skills, as well as analytical and critical evaluation of the topic.

ACADEMIC INTEGRITY (Source: http://www.concordia.ca/students/academic-integrity.html)
Please go to the link above and familiarize yourself with what you are supposed to do and what you are supposed to avoid doing.

The most common offense under the Academic Code of Conduct is plagiarism, which the Code defines as “the presentation of the work of another person as one's own or without proper acknowledgement.”

“Work” here could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material for which the words have been changed but who’s phrasing still closely resembles that of the original source. It could be the work of a fellow student, e.g., a lab report completed by another student, or unauthorized data for a lab report. It could be a paper purchased through one of the many available sources. “Plagiarism” does not refer to words alone – it also refers to images, graphs, tables and ideas. “Presentation” is not limited to written work. It also includes computer and artistic works. Finally, if you translate the work of another person into English and do not cite the source, this is also plagiarism.

The Academic Code of Conduct can be found in section 17.10 of the undergraduate calendar (http://www.concordia.ca/academics/undergraduate/calendar/current/17-10.html). Any form of cheating, unauthorized collaboration, copying or plagiarism found in this course will be reported and the appropriate sanctions applied.

As part of CHEM 495, you are required to attend a seminar and pass a quiz on avoiding plagiarism and other forms of academic dishonesty, offered by the Department of Chemistry and Biochemistry. If you have already attended the seminar and achieved 100 % (110 points) on the quiz **within the past five (5) years** (i.e. Fall 2011 or more recently), you have fulfilled the requirement. The aim of the seminar and quiz is to clarify which practices are considered unacceptable by the Department of Chemistry and Biochemistry. The seminar will be offered during the third week of classes (see below for the times offered); the quiz is online, can be accessed through the MyConcordia portal (click on Powered by Moodle under Course Websites and choose CHEM 101 under Specialized Chemistry Sites; not possible through the guest login!) and can be taken from after the seminar up to the deadline announced on the CHEM 101 site, but preferably as soon as possible. If you do not attend the seminar and/or do not pass the quiz (the passing mark is 100 %), your course grade will be lowered by one full letter grade with an incomplete (INC) notation. Please refer to the academic calendar section 16.3.6 on how to remove the INC and restore the proper course grade.

Mandatory Quiz & Seminar
This short seminar (1 hour) will be held at the following times (**note that late-comers will not be admitted**):

Date (Semester 20XX)	Time	Place
TBD	TBD	TBD
TBD	TBD	TBD
TBD	TBD	TBD
TBD	TBD	TBD

TBD	TBD	TBD
TBD	TBD	TBD
TBD	TBD	TBD

As space for each of the seminars is limited by the room size, please sign up to your preferred time. Sign-up sheets are available outside SP 201.01 (Departmental office).

As space for each of the seminars is limited by the room size, please sign up to your preferred time. Sign-up sheets are available outside SP 201.01 (Departmental office).

If you do not complete this course requirement, your final grade for the course may be lowered by one full letter grade with an incomplete (INC) notation until such time as this requirement is completed. Please refer to the undergraduate calendar (section 16.3.6) for details on removal of an incomplete notation.

* You are exempt if you can locate your ID in the pdf file located on the CHEM 101 Moodle site (for guest login, go to: http://moodle.concordia.ca/moodle, Arts and Science, Chemistry and Biochemistry, Specialized Chemistry Sites, CHEM 101, look under FAQ).

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SENATE
OPEN SESSION
Meeting of March 16, 2018

AGENDA ITEM: Clarification regarding the definition of "in good standing"

ACTION REQUIRED: For information

SUMMARY: During the discussion to approve the title of Librarian Emeritus at the last Senate meeting, it was suggested that the term "in good standing" be clarified.

BACKGROUND: The motion to approve the title of Librarian Emeritus was based on that approved by Senate in March 2001 regarding the title of "Professor Emeritus". At that time, none of the discussions included any questions or proposed definition of what "in good standing" was meant in that context.

Accordingly, Steering Committee reviewed some commonly used definitions of the expression which include:

1. to be in favour or on good terms with someone
2. to be well-regarded and respected in the community
3. to be of good character, defined by one's actions as they pertain to core values such as honesty and integrity
4. to be in compliance with all explicit obligations, while not being subject to any form of sanction, suspension or disciplinary censure

Steering Committee agreed that, in an academic setting, the most appropriate definition would be the one listed under number 4 above. **In other words, a professor or librarian retiring in good standing must be in compliance with all explicit obligations and not subject to any form of sanction, suspension or disciplinary censure.**

Members agreed that individuals subject to pending sanctions at the time of their retirement would not be entitled to use the Emeritus tile. For example, this would cover a case where an investigation is ongoing and an individual opts to retire before the investigation is completed.

PREPARED BY:

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Date: February 27, 2018