1. Approval of the Agenda

2. Approval of the Minutes of the Open Session on January 8, 2018

3. Business Arising from the Minutes

4. Report of the Chair

5. Question Period *

6. Invited Presenter: Aoife Mac Namara, Dean – Faculty of Communication, Art and Technology

7. Reports of Committees

   A) Senate Committee on University Priorities (SCUP)
      i) External Review Mid-Cycle Report for the Beedie School of Business (For Information) S.18-16
      ii) External Review Mid-Cycle Report for the Department of Mathematics (For Information) S.18-17
      iii) External Review of the School of Engineering Science S.18-18
      iv) External Review of the Department of First Nations Studies S.18-19

   B) Senate Committee on Undergraduate Studies (SCUS)
      i) Course Changes (For Information) S.18-20
      ii) New Course Proposals (For Information) S.18-21
      iii) Program Changes (For Information) S.18-22

   C) Senate Graduate Studies Committee (SGSC)
      i) Course Changes (For Information) S.18-23
      ii) New Course Proposals (For Information) S.18-24
      iii) Program Changes (For Information) S.18-25
      iv) Graduate General Regulation (GGR) Revisions S.18-26

   D) Senate Policy Committee on Scholarships, Awards and Bursaries (SPCSAB)
      i) Annual Report 2016-2017 (For Information) S.18-27
8. Other Business
   i) Initiative on Equity, Diversity and Inclusion (For Information) S.18-28
   ii) Teaching Assessment Working Group (For Information) S.18-29

9. Information
   i) Date of the next regular meeting – Monday, March 5, 2018.

Agenda items and papers for the March meeting will be required by the Secretary at noon on Thursday, February 15, 2018. Submissions may be emailed to senate@sfu.ca, but must be followed up by a signed paper submission. These items will be considered by the Senate Committee on Agenda and Rules on Tuesday, February 20, 2018 with Senate distribution on Friday, February 23, 2018.

The Senate agenda and papers for this meeting are available on the Senate website at http://www.sfu.ca/senate/agenda.html.

Detailed curriculum papers can be found on Docushare at https://docushare.sfu.ca/dsweb/View/Collection-12682

Rummana Khan Hemani
Registrar

*Questions should be submitted in writing to Rummana Khan Hemani (email khan@sfu.ca) with “Senate Question” in the subject line by Wednesday, January 31st at 9:00 am.
At its January 10, 2018 meeting, SCUP reviewed the Mid-Cycle Report for the Beedie School of Business which resulted from its 2014 external review. The report is attached for the information of Senate.
MEMORANDUM

ATTENTION: Peter Keller, Chair, SCUP

FROM: Wade Parkhouse, Vice-Provost and Associate Vice-President, Academic

RE: External Review Mid-Cycle Report for the Beedie School of Business

DATE: December 13, 2017

The External Review of the Beedie School of Business was undertaken in March 2014. As per the Senate guidelines, the Unit is required to submit a mid-cycle report describing its progress in implementing the External Review Action Plan. The mid-cycle report, together with a copy of the Action Plan approved by Senate, and the mid-cycle report on the Unit’s assessment of its Educational Goals are attached for the information of SCUP.

c: Ali Dastmalchian, Dean, Beedie School of Business
MEMORANDUM

To: Glynn Nicholls, Director, Academic Planning and Quality Assurance
From: Ali Dastmalchian, Dean
Date: November 30, 2017
RE: Beedie Mid-Cycle Review Report & Documents

Attached please find the Mid-Cycle Report for the Beedie School of Business which details our progress with the Action Plan stemming from the 2014 External Review. The assessment of our Educational Goals is also attached.
**External Review Update for the Beedle School of Business**

<table>
<thead>
<tr>
<th>Action</th>
<th>Progress Made</th>
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<tr>
<td><strong>1. Programming</strong></td>
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<tr>
<td><strong>1.1.1 Undergraduate</strong></td>
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<tr>
<td><strong>Recommendation: Do not expand student numbers</strong></td>
<td>Although we have seen modest growth in our Activity Full Time Equivalents (AFTE) we have held the line on the size of our BBA program and not expanded our Program Full Time Equivalents. We are below the ceiling of international students with a current percentage of 28%.</td>
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<td>• Beedle has adopted a steady state target of 3,600 undergraduate student FTEs. It also has set an upper limit of 30% international students. This number of students has been relatively stable for the past 3 years and this target has been accepted by the University.</td>
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<tr>
<td><strong>Recommendation: Analyze sufficiency of faculty numbers in undergrad program</strong></td>
<td>Sufficiency of faculty is addressed at the aggregate level in the renewal section.</td>
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<td>• Rather than reviewing the undergraduate program regarding sufficiency of faculty, we have reviewed this issue at the faculty level. Results are reported in the Faculty Renewal section.</td>
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<td><strong>Recommendation: Consider support for international students</strong></td>
<td>We have made significant progress in increasing the attention and support to international students' communication skills. We have reduced the average class size in BUS 360W to 36 from 60 and reduced the class size in BUS 303 (ethics) from 90 to 70 while simultaneously increasing the Teaching Support by 25%.</td>
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<td>• Regarding meeting the needs of international students - the Faculty has requested a change to the faculty allocation model (FAM) that would direct more of the premium fee paid by international students to Beedle, where most of the services are delivered. These services are provided at the Faculty level and include:</td>
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<td>a. Reducing the size of core courses. E.g. the BUS 360W Communication core course reduced from a max of 60 to max of 48, thus enabling more one-on-one time between the students and the instructors. This has improved the success rate of students with communication issues.</td>
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<tr>
<td>b. Adding courses. The Faculty has added a first-year Business Foundation Program to address communication skills and to better prepare all students for the curricular and co-curricular opportunities provided by Beedie.</td>
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<td>With Cellular we have added a mandatory team-taught entry level writing and critical thinking course (BUS217W) and arranged for a required business communication course in the pathway program at FIC (BUS 216), our international feeder school.</td>
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<td>Although we did not achieve the success that we expected with our pilot initiative 'Let's Talk Business' and have discontinued it, we have added additional writing mentors and one of our faculty members is part of a university wide strategy to reexamine communications.</td>
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c. Adding Services. The Faculty has added many support services for international students including a non-credit, on-line Business Writing Essential course, developed in partnership with CODE, to support writing development; a "Let's Talk Business" speaking workshop developed in conjunction with the Student Learning Commons to support oral communication; a Business Mentors Program to provide senior mentors to first- and second-year students; a standardized writing assessment for all students (domestic and international) developed in conjunction with the Centre for English Language Learning, Teaching and Research (CELLTR). We have also invested in a two-day professional development of our advising staff on issues related to international students provided by the Faculty of Education.

Recommendation: Examine opportunities for innovative teaching
- Blended learning models will be explored for future deployment when faculty levels are more appropriate. We will continue to work with SFU IT to improve the communication capability across campuses.

1.1.2 Graduate

Recommendation: A "breather" on starting new programs
- Beedie will not add any new graduate programs in the next 2 years unless they come with significant additional resources to help address the current funding deficit.

Recommendation: Reduce silos and look for opportunity to consolidate
- We have not reduced the number of academic directors in the graduate portfolio. Instead, we have increased the number of limited term and continuing lecturers/Senior Lecturers operating as academic...
- The Administrative structure will be rationalized to avoid the situation where research professors are administering individual programs. Lecturers will be used, where possible, to administer a portfolio of programs. A concerted focus on student recruitment in the next 2 years will be followed by a period of reflection and, if underfunding continues, consolidation of programs.

<table>
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<tr>
<th>Recommendation: Consider moving the Surrey Part-Time MBA to Segal</th>
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<tr>
<td>• The Surrey part-time MBA will be monitored with respect to compliance with AACSB requirements and fit within the overall portfolio of graduate programs.</td>
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<tr>
<th>Recommendation: Consider increasing flexibility in the program</th>
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<tr>
<td>• Flexibility within and rationalization across programs will be pursued.</td>
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<th>Recommendation: Participate in Global rankings as EMBA improves</th>
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<td>• The EMBA is not an appropriate program to use to participate in rankings since students are not entering the work force after the program. The MBA program is more appropriate and will be considered.</td>
</tr>
<tr>
<td>• In addition to the above - Beedie has requested an increased share of the tuition revenue from the Community and Corporate EMBA programs including the EMBA in Aboriginal</td>
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- directors in the graduate programs. These individuals have provided excellent academic/administrative skills.

Over the past 3 years, we have significantly increased MBA and EMBA class sizes demonstrated with a 14% increase in AFTE's over Fall 2016 levels in Beedie Specialty Graduate Programs in Fall 2017.

Funding remains an issue and the need for increased numbers of faculty suggests that a growth in revenues will be needed to meet accreditation standards. The graduate programs will likely participate in this revenue increase.

We reconsidered the elimination of the Surrey part-time program. A decision was made in 2015 to wait for one more recruiting cycle before removing the program from Surrey. Two subsequent recruiting cycles have shown significant growth and the current cohort of over 40 students indicates strength in the Surrey part-time recruiting. We have been able to increase the percentage of faculty teaching in the program, but a constraint of faculty resources means the program has still not yet reached the levels suggested to meet for accreditation requirements. This still places the Surrey programs at risk.

As a part of the Build a Better Beedie (B3) process, the grad programs are embarking on a project to reconsider graduate program learning goals. One of the outcomes of this process may be increased flexibility or rationalization of programs but that will be a process that takes several years to accomplish.

The EMBA is not an appropriate program to use to participate in rankings since students are not entering the work force after the program. The MBA program has two elements. Part-time programs (MOT and Surrey) include students with existing high-level employment. The full time MBA is most likely candidate for rankings. It is currently 45% international students (which demonstrates global awareness) but the program is not producing placements that will make SFU competitive in the global rankings. The recognized low-
<table>
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<tr>
<th>Business and Leadership and the EMBA in Northwest BC. The programs incur high costs to design, market and deliver but are strategically important to SFU and their respective communities. Increased revenues would allow Beedie to ensure the sustainability of these programs.</th>
<th>wages in the Greater Vancouver Regional District are a large part of this challenge.</th>
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<tr>
<td><strong>2. Research</strong></td>
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<td>- The research culture is strong within Beedie. We will continue to support it through our two mentor programs (Write Clubs for those people preparing articles and Brown Bag lunches to share research strategies and innovations) and helping faculty apply for research grants (by having an experienced grant facilitator).</td>
<td>We continue to support the strong research culture in Beedie through mentoring programs, research events and grants facilitation. We are currently expanding research seminar events hosted by each Area group to promote research collaboration within and across Areas.</td>
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<tr>
<td>- As tri-council grant funding acceptance rates fall, we will continue to look for alternate sources of research funds.</td>
<td>Most of our research funding continues to come from Canada’s research councils. Our researchers are increasingly able to take advantage of the expanded spectrum of funding programs which SSHRC introduced in 2011 as several have applied to acquire funding through Partnership Development Grants and Partnership Grants programs. We consider this to be an area for potential growth for our faculty. Beedie scholars have continued to achieve success rates above the national average in SSHRC competitions. In addition, we continue to explore alternate sources of funding. Private sector organizations, for example, support research through sponsorship of our Research Centers. We believe company sponsorship (e.g. foundations, not-for-profit organizations) represent the strongest area of potential growth. This type of sponsorship has averaged $152,200 per year between 2011 and 2016, and could grow as we are working to align Research Centers more strongly with Beedie’s programs and overall research strategy.</td>
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<td>- From the external review report: “the university research services need to be improved and run more efficiently.” This is a particularly important issue for Beedie, since our faculty are exploring non-traditional ways of funding and administering their research programs. We continue to</td>
<td>Several new senior managers have been put in place in SFU Research Operations, with an explicit goal of “better and more timely service for researchers from all support offices.” We continue to offer input and support for their change efforts.</td>
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<tr>
<td>Challenge the University to support rather than block these initiatives and look forward to assisting them to put new processes and policies in place.</td>
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<td>The PhD program will stay small, with a senior supervisor for each student being identified at an early stage.</td>
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<tr>
<td>The PhD program is currently small, with 16 students, and with senior supervisors for each student being identified at an early stage. A taskforce has been created this fall to consider redesign of the program to enhance financial and other support for students and program outcomes.</td>
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### 3. Engagement and Administration

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<th>The Marketing Department will transition away from print toward the development and deployment of digital assets. A video unit will be developed and used to support recruitment of students and engagement with the community.</th>
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<tr>
<td>A Senior Producer and a videographer have been hired in 2015. The school has since developed a significant bank of video content ranging from alumni profiles, guest speaker talks, events, and interviews. Videos are regularly used in marketing, social media, advertising, and engagement activities. A selection of guest speaker videos are featured on the Ideas@Beedie website, the school’s content portal serving the business community by sharing content themed around the school’s strategic pillars such as Innovation &amp; Entrepreneurship, International, and Sustainability.</td>
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<tr>
<th>External Relations will refine and ensure that Beedie Community, its software systems to track our external engagement partner, is meeting the school’s needs.</th>
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<tr>
<td>Moved from SFU servers to vendor hosted to allow for quicker response times to address issues and speed up customization. Upgraded to the newest version of software that provides new features and allows more flexibility in tracking user engagement. Currently working in Beta mode in order to implement enhanced feature requests and automation. Met with various Beedie units to standardize business process flow and tracking of user activities.</td>
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<tr>
<th>Engagement programs such as Mentors in Business (300 pairs) and Speakers on Campus (300 per year) continue to be a keystone of community engagement. We will implement Career Talk, an online matching system for students, alumni, employers and friends of Beedie to connect with each other for informational interviews.</th>
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<tr>
<td>Mentors in Business continues to be on track with the addition of new training opportunities for mentors and a revised orientation for mentees focusing on SMART goal setting. Speakers on Campus has expanded to include not only guest speaking opportunities but other experiential opportunities such as one-on-one interviews with local business leaders, salary negotiation simulations, and mock networking simulations. CareerTalk was implemented but, due to technical issues, was shut down temporarily. It is expected to relaunch in November 2017.</td>
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June 2017
- Both Graduate and Undergraduate Career Management Centres will explore how to automate and streamline basic services such as resume writing and will develop online career educational resources in order for advisors to focus on higher value services and increase capacity.

  The Graduate CMC has implemented VMOCK, an online tool to assist with resume writing, and has developed 2 online workshops (resume writing and cover letter development) on CANVAS. Plans are in place to launch two more online workshops in 2018.

- Undergraduate Career Management will continue to expand its specialty programs such as Investment Banking Prep, Consulting Prep, Sales and Marketing Programs, etc. in order to enhance career preparation and marketability of students.

  The Undergraduate CMC has evolved career interventions for all BBA 3600+ students. Business Career Passport is now a first-year requirement in including 6 workshops which a hybrid (online & in-person) flipped classroom model and assessment of deliverables. In BUS 343 Introduction to Marketing, we host a Personal Branding Event in which all students engage in mock networking & interviews with industry professionals to receive feedback. We have hosted/supported specialty programs such as Investment Banking Prep program, CPA Prep, Company tours, Management Consulting Career Prep Program, Beedie Urban Development Program, Company tours etc.

- SFU is celebrating its 50th Anniversary starting in September 2015 and we will be hosting a special series of student and alumni events to celebrate and create more engagement.

  We hosted over 50 alumni, donors, faculty, students and staff at SFU's 50th Anniversary event. We hosted a series of alumni and student events branded with the 50th Anniversary, including the 15th Anniversary of the Management of Technology MBA, and alumni socials in Vancouver, Toronto and Shanghai.

4. Working Environment

- We need to collaborate and communicate more across our 3 campuses, and will participate in the university's "virtual campus" initiative.

  Beedie has invested its own resources in creating video conference rooms between its Burnaby, Surrey and downtown campuses, including the new Charles Chang Innovation Centre building. We were not able to benefit from the University initiative.

- We will continue to request support from SFU facilities to improve the technology in our Segal classrooms to bring them up to standards set by comparable Canadian graduate business programs.

  We are currently working (as of August, 2017) with the Executive Director of SFU Vancouver on a 5-year capital plan project charter to apply for funds to pay for refurbishment and upgrade of all teaching and public spaces at Segal in order to maintain our brand reputation with our premium graduate programs. This includes updating our AV and classroom technology.

5. Accreditation
- A careful monitoring of faculty teaching arrangements for 2014/2015 will result in as many research faculty teaching in the graduate and undergraduate programs as possible. Our statistics for this year are critical for continuing our accreditation. We received full reaccreditation from AACSB in fall of 2015 and from EQUIS/EFMD in 2017 indicating that the ratios were acceptable. They are fairly robust for most of our graduate programs (except EMBA ABL and NW where a large amount of teaching is done by outside faculty), and the ratios for the BBA program were also at acceptable levels. However, overall the student/faculty ratios at Beedie need to be substantially improved.

- We will develop a solid plan for future recruitment of faculty that will demonstrate how future improvements will be funded and implemented. Decisions by the University with respect to supporting these needs must be in place before the AACSB visit in November if we are to avoid jeopardizing accreditation. Since the 2014/15 academic year, we have hired 13 new faculty members and 12 faculty members have retired or left for other business schools resulting in a net increase of 1. We are in the process of hiring another 8 faculty members this year (2017/18).

- We have been working on the TRACS application to support accreditation for the past 3 years. It will be completed in the next review period. The work on accreditation with TRACS is completed.

- All of the Faculty CV information and teaching information will be collected in TRACS and reports will be generated to support the AACSB visit in the Fall of 2015. This has been achieved.

6. Faculty Renewal

- As a short-term response, undergraduate student enrolment has been capped and no new graduate programs will be introduced in the near future. The BBA program has been capped and remains at about 680 in-take (3,700 head counts or about 3,200 FTE). We have had growth in enrollments of existing graduate programs, and as noted above have not launched any new MBA or MSc programs, though a certificate and NW cohort of our EMBA were developed. In order to initiate new strategic graduate programs, we will need different financial arrangements and adequate resources and space/technology.

- A plan is in place to ensure the 2015 Accreditation team sees that the Beedie School is working to address the shortfall. We are actively recruiting to address the strains that exist on the Faculty’s teaching resources. In the 2016/17 academic year we hired 3 new faculty members (an Assistant Professor in Marketing, Lecturer in TOM, and the Ryan Beedie Chair in Finance).
This year (2017/18) we are recruiting for an additional 8 positions. 5 of the 8 new positions are supported by 5-year bridge funding from the VPAs office.

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<tr>
<th>• We do not plan to immediately reduce the number of courses/sections for 3 main reasons:</th>
<th>• We are keeping the BBA program’s numbers constant—no growth (with the same ratio of international to domestic students—28%)</th>
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<tr>
<td>a. SFU is a public, comprehensive University, not a private institution and should be accessible to our local communities. Beedie is already under-responding to the needs of local students. Approximately 20% of undergraduate applications to SFU request Business as their first choice major; yet SFU provides only 6.2% of all new student intake spaces to the Beedie School. Reducing the overall size of our student body, in the face of consistent high demand for Business programs, would further erode our ability to serve the demands and needs of our domestic students.</td>
<td>• We are increasing the existing graduate program numbers to the maximum that the classrooms in Segal and Surrey would accommodate (and the resources we have can support them for GDBA)</td>
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<tr>
<td>b. SFU relies on international students for diversity and also for revenue. Beedie has been asked to take a large share of international students and is working to enable these students to succeed. Lowering the numbers of international students would reduce revenue and reduce Beedie’s ability to pay for support services for all students.</td>
<td>• Any new graduate programming requires new financial arrangements to enable us to support the programs fully.</td>
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<td>c. Shrinking the student numbers would result in lower revenue to the Faculty and therefore to faculty or staff being laid off, since 92% of revenue is used for staff and faculty salaries and benefits. The remainder of the budget is almost entirely used to provide premium services to students and support services to international students.</td>
<td>• Space is a crisis issue for Beedie</td>
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<td>• The Faculty has requested an increased share of tuition fees for both premium fees (undergrad and grad) and international tuition fees. The principle being used for this argument are:</td>
<td>• We plan to develop and expand our non-credit revenue generating Executive Programs in 2018.</td>
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We are in discussion with the VPA office in relation to funding issues, as well as special treatment of special programs.
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<th>Students who pay premium fees are paying more for general university services than regular students.</th>
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<td>Premium services are entirely provided by the Faculty, therefore, all of the premium tuition should flow to the Faculty.</td>
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Introduction

In accordance with the School’s accreditations (AACSB and EQUIS), and the University’s accreditation (NWCCU), the Beedie School has worked to establish and assess education goals in each degree program since 2010. The School has two Assurance of Learning Committees (undergraduate and graduate) to provide oversight, facilitate process, and make recommendations to program and curriculum committees where needed as part of the measurement and observation of student performance on specific educational goals.

Assessment Process

The School uses direct embedded measures to collect formative and summative assessments on degree program educational goals using assignments that are 10% or more of an overall course grade. Educational goals and objectives have been mapped to specific courses within a program and rubrics have been developed for all assessments taken. The assessment process and cycle depends on the academic career and curriculum mapping. The School uses a four-point scale (Exceeds Expectations, Meets Expectations, Approaches Expectations, Fails Expectations) for all assessments. Starting with the Fall 2015 semester, the benchmark for students meeting and exceeding expectations was raised to 75% from the 65% which had been implemented at the beginning of the assessment practice at the School. The 75% benchmark more accurately reflects the expected student performance on educational goals.

Undergraduate Program

Educational goals have been developed at both the program level (BBA) and for each of the eight disciplinary concentrations available to students (Accounting, Entrepreneurship and Innovation, Finance, Human Resource Management, International Business, Management Information Systems, Marketing, Operations Management). The undergraduate program offers multiple course sections in each term of an academic year and takes formative and/or summative measures each semester based on curriculum mapping.

Graduate Programs

Educational goals at the graduate program level have been established for each degree (Full-time MBA, Part-time MBA, Management of Technology MBA, Executive MBA, Master of Science in Finance, and PhD in Business Administration) and goals for the newest program (Executive MBA in Aboriginal Business and Leadership) has been developed over a series of iterations with
curriculum mapping in process and under consideration. Graduate program assessment is either formative or summative depending on program specific curriculum mapping.

**Educational Goal Updates: 2015 forward**

Based on the Educational Goals Assessment Plan submitted September 1, 2015, three future assessment plans were identified at that time.

*Monitoring the effects of the 75% benchmark on assessment*

The move to raise the benchmark for student learning has become the accepted standard. The 75% more accurately reflects the expectations of student learning than the preliminary mark of 65%. There is no intention to move the benchmark any further at this time.

*Periodic review of existing educational goals*

The last changes made to the BBA educational goals were in Spring 2013. Concentration educational goals that have been updated more recently (2015 or later) include: Accounting, Entrepreneurship and Innovation, Human Resource Management, and Operations Management. At the graduate level, educational goals updated include: Executive MBA, Management of Technology MBA, the Master of Science in Finance, and the PhD in Business Administration.

*Finalization of EMBA in Aboriginal Leadership and Business educational goals*

The last draft of the Executive MBA in Aboriginal Leadership and Business educational goals were completed in late 2015 with preliminary curriculum mapping under consideration. Rubrics for assessment are currently pending development.

*Assessment Findings and Actions Taken*

Based on the assessment results from each academic year, programs and areas are able to review findings and make changes when needed to address rubric clarity, course mapping, and educational goal changes and refinements. We continue to monitor submitted data for consistency of measures and trends in student performance to close the loop in an on-going cycle of continuous improvement.

**Undergraduate Program**

BBA program educational goals where continued monitoring is needed are related to goals of Critical Thinking (BUS 478), Communication Skills (BUS 360W), and Legal Knowledge (BUS 393) where measurements were at, or slightly below, the 75% benchmark. The rubric for critical thinking was last reviewed in 2011 and the legal knowledge rubric was refined in 2013. The written communication skills rubric was revisited in 2016. The School is actively working on addressing the measurement of Oral Communication Skills, which has not been assessed yet.
Accounting

The Accounting Area reviewed its goals to ensure better correspondence between objectives and rubric traits. This resulted in changes to the rubrics of Advanced Financial Accounting (BUS 420), Advanced Management Accounting (BUS 424) and Auditing (BUS 426). Due to changes in accounting disciplinary knowledge, the Accounting Area reconsidered what knowledge a graduating concentrator should have which led to the rewriting, clarification, deletion and replacement of objectives and rubric traits.

Finance

The Finance Area examined assessment results in Spring 2017 and while students struggled with some educational goals (bond and stock investing; derivative securities), the Area says this is normal and will continue to monitor their student learning. The rubric for one course (BUS 413) was revised for consistency and clarity in 2013/2014 and since then it has been deemed stable and functioning to better assess student learning.

Entrepreneurship and Innovation

The goals and objectives were reviewed and revisited in Spring 2015 which led to the revision of the BUS 477 rubric. The 2015/2016 assessment results indicated that students met the benchmark for all of the traits. Student learning will continue to be monitored and the measurement of the remaining educational goal is in the process of development.

Human Resource Management

In Summer 2014, an instructor submitted suggested refinement to a rubric for BUS 374 which was submitted to the Area Coordinator for review. The proposed HR Management concentration rubric change necessitated changes to concentration goals 2 and 3 in Spring 2015 to improve alignment. The revised rubric was piloted in Summer 2015 and the 2015/2016 results were reviewed by the Area. Student learning met or exceeded benchmark for all (old and new) traits. The goals, objectives and rubric traits appear to be better aligned with the course content and the Area will continue monitoring student learning.

International Business

Overall, the IB Area goals, objectives and rubrics were deemed to be stable and well related to the discipline specific knowledge graduating concentrators should possess. The one exception was a trait meant to capture students' ability to participate in case discussions. The appropriate case material was not always conducive for assessment. This trait was dropped by the IB Area following Summer 2014. Students had difficulty meeting some traits measured in 2015/2016, which the Area will review and provide feedback on possible issues.
Management Information Systems

While the Area did not change its goals, objectives or course rubrics after Spring 2014, the 2015/2016 results (reviewed in early 2017) identified three problem areas. In BUS 362, when students’ learning improves on one trait, another trait suffers. The instructor has committed to bringing more balance in the coverage to ensure better student learning on all traits. In BUS 468, the instructors have committed to introduce/review concepts from the core strategy course (BUS 478) to help students who have not yet taken the Strategy capstone. Instructor assessors are also working on ensuring consistency in assessment across course sections.

Marketing

Assessments over the past two years show students are above benchmark with the exception of a concentration goal on target market analysis and selection. The goals and rubrics used in Marketing have been in place without changes since Fall 2013. The Area appointed course coordinators in 2012/13 to coordinate instructors for multiple course sections to ensure coherence and consistency of content.

Operations Management

The OM Area included a new educational goal (sustainable operations) in Spring 2014 which was to be mapped to BUS 475 and assessed in 2016. The course was not offered in 2016 due to reassignment of the faculty member originally slated to teach this course. However, a draft rubric was developed and preliminary measures were taken in Spring 2017. The BUS 473 course rubric was revised in Spring 2014. This change included dropping the assessment of particular quantitative knowledge that was already assessed in a core OM course. The 2015/2016 results reviewed in early 2017 by the Area indicated students are still struggling with specific quantitative knowledge required for this course.

Graduate Programs

Graduate programs all vary in length and approach to assessment. Each program has an independent set of educational goals defined and mapped to the program curriculum to identify places where assessment may be taken. Several programs had changes in Academic Director roles (FT MBA, MOT-MBA, EMBA, MScF) which in turn updated educational goals in concert or following curricular changes.

Full-time MBA

The Full-time MBA educational goals are measured in the capstone course between a written assignment and a simulation. The Full-time MBA program made the transition from student final project to the Comp-XM simulation exam from CAPSIM in 2011. CAPSIM introduced educational goals to the Comp-XM simulation in Fall 2013. Students passed benchmark on educational goals measured outside of the Comp-XM simulation. The CAPSIM Comp-XM simulation results indicated some issues with the deployment of the tool itself from 2012-2014. In cases where
students completed all five rounds of the simulation, areas for improvement appeared to occur in HR and Finance. The program will be reviewing options for other simulation tools for comparison with past findings.

**Part-time MBA**

The Part-time MBA, when launched in Spring 2014, initially adopted the same program educational goals as the Full-time MBA. However, student demographics proved quite separate from the Full-time MBA. Discussions have been underway about the establishment of Part-time MBA specific educational goals that are more suited to the program particulars.

**Executive MBA**

The Executive MBA curriculum underwent changes under the new Academic Director and the existing educational goals were revised and re-mapped to curriculum. The previous educational goals were all assessed in the final capstone project which was problematic due to the broad range covered by the past educational goals and the actual scope of each project. Rubrics were also revised and the total number of measured traits were reduced from 22 to 10. This change also moved discrete elements from a single assignment to assignments in specific topic courses.

**Executive MBA in Aboriginal Business and Leadership**

The EMBA in Aboriginal Business and Leadership (EMBA-ABL) is a 33-month program that was launched in Fall 2012. The initial drafts of educational goals for the program have been revisited and revised as each cohort has progressed through the program with the last iteration of the educational goals completed in 2015. Of particular note with regard to measurement of learning is the revision of the way students will complete the program. The first cohort completed the program with an applied project, often the development of a business plan for an existing or proposed business. However, the variance between them and the relatively small number of students (17) made it difficult to use the projects as an effective measure of learning objectives. The second cohort completed the program through a structured capstone course, the central assignment being an analysis of a business opportunity or problem framed as responses to a series of questions. The questions will reflect the October 2015 educational goals for the program and will be reviewed for fit prior to development of a rubric for piloting assessment.

**Management of Technology MBA**

With a new Academic Director in place, the program reviewed the existing educational goals and made revisions in 2016. Assessments made prior to the changes indicated no issues with students passing the 75% benchmark on educational goals. The program measures student learning using the final project in the capstone course and intends to continue the same process of assessment with the new educational goals in place.
Master of Science in Finance

The new Academic Director reviewed the educational goals in Spring 2015 and reduced the number of goals from seven to four. These goals were also re-mapped to reflect assessment of the core courses MScF students would take and the two elective streams students would pursue – Investment Management and Risk Management. Curriculum mapping and rubrics were developed and assessment is distributed across courses instead of concentrated in capstone courses and final projects. Updated rubrics were completed in Fall 2015 and preliminary measures using each rubric occur at the next course offering.

PhD in Business Administration

The Academic Director for the program reviewed the educational goals for the PhD program in 2014/15 and made revisions. The teaching educational goal was removed as it contained unobservable objectives and the program does not have a required teaching course that students take. The existing educational goals were refined and the rubrics updated to reflect those revisions. Updated rubrics were completed in Fall 2015. The two places for measurement chosen are the comprehensive exam (BUS 991) and the thesis defense (BUS 992).

Educational Goal: Next Steps – 2017 forward

In 2015, the Beedie School completed a Continuous Improvement Review (CIR) as part of maintaining its AACSB Business accreditation. The Peer Review Team (PRT) made recommendations with regard to the School’s approach to assessment and Assurance of Learning (AOL) practice, which the School is in the process of examining and preparing for implementation prior to the next CIR and PRT visit. These recommendations included the “refinement and clarification of the school’s strategy and a focusing of the AOL efforts” and “AOL focus”.

While the school has done a commendable job of responding to the previous CIR by creating a comprehensive AOL review system and database, it was felt by the PRT that the focus of the AOL was in need of sharpening (e.g., deciding upon 2-3 key features of learning outcomes related to the school’s strategic objectives rather than having 5-7 features that are only loosely coupled). The AOL outcomes should be adapted to the strategic objectives of experiential learning outside of the traditional classroom as well to help reinforce the school’s achievement of general strategy.

In response to recommendations from the AACSB PRT in 2015 and the more recent revision of the Beedie School mission and calling, the School is in the process of reviewing all program level educational goals for alignment with the School’s new mission/calling that was developed. The Beedie 2022 vision for the Beedie School of Business includes a revised calling:
We develop innovative and socially responsible business leaders with a global perspective through education, inspired by research and grounded in practice.

Aligning educational goals with our Calling

The three themes of innovation, social responsibility and global perspective will guide the educational goal review process. Over the course of the 2017/18 academic year, educational goals at the undergraduate and graduate program levels will be revisited and revised to reflect these themes. Once complete, the process of reviewing the curriculum mapping of the new sets of educational goals will begin in the 2018/19 academic year. Current goals, at the program and concentration level, will remain in place until revisions are complete.

Continuing assessment practices

The School expects to maintain the 75% benchmark, the four-point scale for assessment, and the use of direct embedded measurements to reflect current student abilities and discover where learning improvements can be made through curricular/program improvements and student learning support. To address the lack of oral communication goal measures, business communication instructors have developed an oral communication rubric and will begin pilot testing it in the Fall 2017 semester in BUS 360W.
MEMORANDUM

ATTENTION: Ali Daastmalchian, Dean, Beedie School of Business

FROM: Glynn Nicholls, Director, Academic Planning and Quality Assurance

RE: External Review Mid-Cycle Report for the Beedie School of Business

DATE: June 12, 2017

As per Senate guidelines, the Beedie School of Business is to report on progress being made in the implementation of the Action Plan that resulted from its external review in June 2014. This report will be presented to SCUP and Senate for information. The Dean will be asked to attend the SCUP meeting to provide comment and answer any questions about the update on the Action Plan.

In addition, as per the agreement with Senate, mid-cycle reports in 2017, following the requirement to develop Educational Goals for programs in the Beedie School of Business, are expected to have conducted an assessment of those goals/outcomes. Please include as part of this mid-cycle report submission a 2- to 4-page narrative description articulating the assessment process undertaken by the academic unit, and any changes or adjustments to the established educational goals, the assessment process, and/or the program curriculum that may have arisen as a result of the findings of the assessment. Should you require any assistance in preparing this part of your report, please contact your Educational Consultant from TLC.

Please submit your progress report, using the attached template, by Thursday, November 30, 2017 to Bal Basi at bbasi@sfu.ca. Also attached, for ease of reference, is the Action Plan that was approved by Senate on October 5, 2015.

Please contact me at 2-6702, glynn.nicholls@sfu.ca, or Bal Basi at 2-7676, bbasi@sfu.ca, if you have any questions or concerns regarding the external review update process.

Thank you.

Attach.

cc: P. Keller, Vice President, Academic and Provost
I begin by thanking the Review Committee for a thoughtful report, which outlines the significant strengths of the Beedie School of Business as well as the challenges it faces. This document will focus the Beedie School’s response to the major issue identified by the Reviewers, namely the lack of resources and its impact on the faculty complement. This issue is highlighted in the quote from the External Review Report:

"Resources truly are an issue. The faculty complement is insufficient for the numbers of students. There is little investment in dedicated resources (e.g., for international students, in IT, etc.) compared to what would be usual for business schools of this size.... This is a serious issue, possibly the most serious one facing Beedie and SFU. In short, if Beedie is to retain its position as one of Canada’s very good business schools it simply cannot cope with an ever increasing student population and an overstretched faculty... Additional financial resources will be needed to allow Beedie to cope with its present student population... The Beedie School is at or below the minimum AACSB standard for “participating” versus “supporting” faculty."

The resource issue is important not only to the Beedie School but also to SFU as a whole. According to the 2015-16 Faculty Allocation Model (FAM), Beedie activities generate $37M in tuition revenue representing 18% of the University’s tuition total. Over half of this tuition ($20M) is distributed to other SFU departments and services. On average, each of the 87 Beedie faculty members generates $422,000 in tuition each year. This means that 18% of the tuition revenue at SFU is generated from 9% of SFU’s faculty contingent (the Beedie School contingent). In addition, Beedie receives only 8.6% of the provincial grant allocated to faculties though Beedie provides 13% of the overall activities and 18% of total tuition revenue at SFU. No other SFU faculty has similar ratios. While the Business school revenues support all programs at SFU, not just its own, it can only continue to do so if it is healthy.

The external review committee notes that Beedie has excellent programs, but there are obvious signs of pressures creating faculty overstretch. The cycle of these pressures is perhaps best exemplified by the addition of International students in the undergraduate program. For example, over a two-year period (2009-2011), Activity from Full-time Equivalents (AFTE) international students within Beedie increased 70% (from 391 to 670). This activity generated new tuition revenue and both SFU and the VP Academic benefited as they collected 55% of this additional revenue. (~$6-7M annually). The Beedie School had to accommodate a highly international classroom (61% English as a second language), and responded by implementing new courses, lowering class size, making pedagogical changes, and increasing the overall cost of admission processing and communication skill support. The revenue from international students paid for some of these
necessary additional services within the faculty but not all. However, the revenue wasn’t sufficient to hire the additional faculty to staff the courses. More resources are required by the Faculty to support not only these students but to ensure a high quality education for all students taking Business courses.

The lack of resources places programs at risk, particularly Beedle’s most recent programs including the Aboriginal EMBA, Surrey Part-time MBA, Undergraduate Certificate in Innovation and Entrepreneurship and Undergraduate Business Minor. These programs have been developed to further engage communities in strategic areas within and beyond SFU. Developing and maintaining strategic programs comes at a cost, particularly when the Business faculty complement remains constant.

At the core of the issue is the fact that faculty costs exceed the amount allocated through the Faculty Allocation Model (FAM). Without significant changes to the FAM, there is no long-term sustainable way that the Beedie School can deliver a high quality educational experience to our students. Reducing student numbers (international or domestic) reduces the Faculty budget, which leads to reductions in faculty and staff and decreases the capacity to serve remaining students. Increases in the number of students adds resources, but not enough to cover the cost of serving additional students. This leads to overstretch in existing capacity, which is the current situation. Neither growth nor reduction in numbers of students leads to a high quality, sustainable program. Therefore, Beedie requests a larger share of the premium and international fees from the University.

We recognize the challenge of significantly altering the FAM. This is particularly true in an era of stagnant budgets and increasing costs. These changes will likely require a close look at central services and their effectiveness in supporting revenue-generating faculty activity. In the end, SFU faces a difficult choice of adequately funding Faculties like Beedie through FAM or prioritizing funding to central services in the hope that these central services will cover the inevitable decline of Faculty-based resources. We believe a close examination would suggest that investments at the Faculty level, where revenues are generated, provide the best opportunity for success. I therefore urge the VP Academic to open the FAM for major reconsideration and to provide a more sustainable level of funding to the Beedie School to address the issue of resourcing noted in the external review.

Business Schools are often considered to be privileged units with strong demand from students, premium tuition fees, and well paid faculty. This perception is to a certain extent true. However, because of the strong demand and premium fees, business schools operate in a very competitive environment. There are many alternatives for the best students and the best faculty members and each expects a high quality environment with excellent research, pedagogy, community engagement and placement activities.

Beedie is a good contributor to the University - bringing premium tuition, high quality students, strong research and deep ties with the local business community. We sincerely hope that SFU recognizes this value and supports our students and programs by reallocating funds so we can continue to contribute to SFU and the wider community.
OVERVIEW:
The External review indicated that Beedie's undergraduate and graduate programs are excellent programs with strong students and relevant curricula. In providing recommendations, the External Review separated undergraduate and graduate issues. We therefore respond to the graduate and undergraduate responses separately below.

1.1 RECOMMENDATIONS - UNDERGRADUATE
1. Do not expand student numbers
2. Analyze sufficiency of faculty numbers in undergrad program
3. Consider support for international students
4. Examine opportunities for innovative teaching

UNDERGRADUATE PROGRAM - RESPONSE:
• Beedie has adopted a steady state target of 3600 undergraduate student FTEs. It also has set an upper limit of 30% international students. This number of students has been relatively stable for the past 3 years and this target has been accepted by the University.
• Rather than reviewing the undergraduate program regarding sufficiency of faculty; we have reviewed this issue at the faculty level. Results are reported in the Faculty Renewal section.
• Regarding meeting the needs of international students - the Faculty has requested a change to the faculty allocation model (FAM) that would direct more of the premium fee paid by international students to Beedie, where most of the services are delivered. These services are provided at the Faculty level and include:
  a. Reducing the size of core courses. E.g. the BUS 360W Communication core course reduced from a max of 60 to max of 48, thus enabling more one-on-one time between the students and the instructors. This has improved the success rate of students with communication issues.
  b. Adding courses. The Faculty has added a first year Business Foundation Program to address communication skills and to better prepare all students for the curricular and co-curricular opportunities provided by Beedie.
  c. Adding Services. The Faculty has added many support services for international students including a non-credit, on-line Business Writing Essential course, developed in partnership with CODE, to support writing development; a "Let's Talk Business" speaking workshop developed in conjunction with the Student Learning Commons to support oral communication; a Business Mentors Program to provide senior mentors to first and second year students; a standardized writing assessment for all students (domestic and international) developed in conjunction with the Centre for English Language Learning, Teaching and Research (CELLTR). We have also invested in a two-day professional development of our advising staff on issues related to international students provided by the Faculty of Education.
• Blended learning models will be explored for future deployment when faculty levels are more appropriate. We will continue to work with SFU IT to improve the communication capability across campuses.
1.2 RECOMMENDATIONS – GRADUATE:
1. A “breather” on starting new programs
2. Reduce silos and look for opportunity to consolidate
3. Consider moving the Surrey Part Time MBA to Segal
4. Consider increasing flexibility in the program
5. Participate in Global rankings as EMBA improves

GRADUATE PROGRAM - RESPONSE:
- Beedie will not add any new graduate programs in the next 2 years unless they come with significant additional resources to help address the current funding deficit.
- The Administrative structure will be rationalized to avoid the situation where research professors are administering individual programs. Lecturers will be used, where possible, to administer a portfolio of programs. A concerted focus on student recruitment in the next 2 years will be followed by a period of reflection and, if underfunding continues, consolidation of programs.
- The Surrey part-time MBA will be monitored with respect to compliance with AACSB requirements and fit within the overall portfolio of graduate programs.
- Flexibility within and rationalization across programs will be pursued.
- The EMBA is not an appropriate program to use to participate in rankings since students are not entering the work force after the program. The MBA program is more appropriate and will be considered.
- In addition to the above – Beedie has requested an increased share of the tuition revenue from the Community and Corporate EMBA programs including the EMBA in Aboriginal Business and Leadership and the EMBA in Northwest BC. The programs incur high costs to design, market and deliver but are strategically important to SFU and their respective communities. Increased revenues would allow Beedie to ensure the sustainability of these programs.

1.3 RESOURCE IMPLICATIONS (IF ANY):
- Additional resources from changes to RAM regarding international and premium fees are required for Beedie to hire more professors and reduce the overstretch situation (see Faculty Renewal section).
- Additional resources from changes to RAM regarding graduate international fees, community and corporate EMBA programs will be required to support graduate students and program costs and ensure these programs are successful.

1.4 EXPECTED COMPLETION DATE/S:
- Changes to the Faculty Allocation Model are being considered Summer/Fall 2015 and could be implemented for the 2016/17 budget year.
- Rationalization of the graduate programs may occur after analysis of the recruiting cycle in September/October 2015.
- Should additional resources from reallocation of tuition revenues not be available, alternate strategies will be needed to wind down programs. This will likely result in cancellation of one or more of our local part time graduate programs: the EMBA, the EMBA in Aboriginal Business and Leadership, the MBA in the Management of Technology or the Part-time MBA in Surrey. These changes would need to be managed strategically and would likely take until 2018 to fully enact.
2. RESEARCH

From the external report: "The School has been doing well in research in terms of both quantity and quality. Overall, the Committee is highly positive toward the commendable performance in research and scholarly activities by Beedie’s faculty."

2.1 ACTION/S (WHAT IS GOING TO BE DONE):

- The research culture is strong within Beedie. We will continue to support it through our two mentor programs (Write Clubs for those people preparing articles and Brown Bag lunches to share research strategies and innovations) and helping faculty apply for research grants (by having an experienced grant facilitator).
- As tri-council grant funding acceptance rates fall, we will continue to look for alternate sources of research funds.
- From the external review report: “the university research services need to be improved and run more efficiently”. This is a particularly important issue for Beedie, since our faculty are exploring non-traditional ways of funding and administering their research programs. We continue to challenge the University to support rather than block these initiatives and look forward to assisting them to put new processes and policies in place.
- The PhD program will stay small, with a senior supervisor for each student being identified at an early stage.

2.2 RESOURCE IMPLICATIONS (IF ANY):

- The PhD program funding will be augmented with funds from the Research Centres.

2.3 EXPECTED COMPLETION DATE/S:

- These activities are already underway and will continue

3. ENGAGEMENT and ADMINISTRATION

3.1 ACTION/S (WHAT IS GOING TO BE DONE):

- The Marketing Department will transition away from print toward the development and deployment of digital assets. A video unit will be developed and used to support recruitment of students and engagement with the community.
- External Relations will refine and ensure that Beedie Community, its software systems to track our external engagement partner, is meeting the school’s needs.
- Engagement programs such as Mentors in Business (300 pairs) and Speakers in the Classroom (300 per year) continue to be a keystone of community engagement. We will implement Career Talk, an online matching system for students, alumni, employers and friends of Beedie to connect with each other for informational interviews.
- Both Graduate and Undergraduate Career Management Centres will explore how to automate and streamline basic services such as resume writing and will develop online career educational resources in order for advisors to focus on higher value services and increase capacity.
- Undergraduate Career Management will continue to expand its specialty programs such as Investment Banking Prep, Consulting Prep, Sales and Marketing Programs, etc. in order to enhance career preparation and marketability of students.
- SFU is celebrating its 50th Anniversary starting in September 2015 and we will be hosting a special series of student and alumni events to celebrate and create more engagement.
3.2 RESOURCE IMPLICATIONS (IF ANY):
- The Marketing Budget has been increased with the addition of a 2 person video team. Some resources to fund this have been taken from contracts with agencies and printed media.
- There may be significant up front cost for new software services and video production for CMC services.
- Engagement programs such as Mentors In Business and Speakers in the Classroom require staff and operational expenses and we are fundraising for those programs. Career Talk is a yearly license and can be scaled up without additional cost.
- We have allocated funds from Carry Forward and the Dean’s Strategic Priority Fund for 50th Anniversary Activities.

3.3 EXPECTED COMPLETION DATE/S:
- SFU’s 50th Anniversary formally starts September 9th 2015 and runs through to the end of June 2016.
- CMC Services aim to have the new software and video implemented by the August 2016.

4. WORKING ENVIRONMENT

4.1 ACTION/S (WHAT IS GOING TO BE DONE):
- We need to collaborate and communicate more across our 3 campuses, and will participate in the university’s “virtual campus” initiative.
- We will continue to request support from SFU facilities to improve the technology in our Segal classrooms to bring them up to standards set by comparable Canadian graduate business programs.

4.2 RESOURCE IMPLICATIONS (IF ANY):
- These resources will be outside of our budget. We applied (unsuccessfully) for a UPF grant, and will attempt to find external funding to make these improvements.

4.3 EXPECTED COMPLETION DATE/S:
- Completion is entirely dependent on access to funds.

5. ACCREDITATION

From the external review report: "While the Beedle School has been able to absorb the growth that has been mandated by the University, the expansion risks jeopardizing maintenance of AACSB accreditation, scheduled for 2015."

OVERVIEW:
The Beedle School of Business is accredited both by American-based AACSB and European-based EQUIS, an accomplishment that only a few business schools in Canada have attained. These accreditations help us to attract international students, both undergraduate and graduate. International students are important both for revenue purposes and also to bring a very important global perspective to the classroom. Accreditation brings with it costs, however. AACSB is particularly focused on the ratio of research-active professors in the classroom. As the external review noted, our faculty overstretch puts this accreditation at risk. Therefore we need to find financial resources to increase our faculty complement.
5.1 ACTION/S:
- A careful monitoring of faculty teaching arrangements for 2014/2015 will result in as many research faculty teaching in the graduate and undergraduate programs as possible. Our statistics for this year are critical for continuing our accreditation.
- We will develop a solid plan for future recruitment of faculty that will demonstrate how future improvements will be funded and implemented. Decisions by the University with respect to supporting these needs must be in place before the AACSB visit in November if we are to avoid jeopardizing accreditation.
- We have been working on the TRACS application to support accreditation for the past 3 years. It will be completed in the next review period.
- All of the Faculty CV information and teaching information will be collected in TRACS and reports will be generated to support the AACSB visit in the Fall of 2015

5.2 RESOURCE IMPLICATIONS (IF ANY):
- $40,000 will be allocated to preparation of and hosting of the AACSB visit. This is over and above existing costs (part time for 1 faculty member, full time for 1 APSA staff)
- 1 APSA staff and 3 co-op students will be used full time to support the TRACS initiative

5.3 EXPECTED COMPLETION DATE/S:
- November 2015

6. FACULTY RENEWAL

From the External Review Report: "The growth in student numbers... has stretched the resources of the faculty beyond what would be acceptable in strong business schools....Signs of strain are impossible to ignore: Over-reliance on sessionals, lecturers, and non-full-time faculty; Pressures on full-time faculty to teach extra-to-load; and PhD students teaching courses before passing candidacy exams... The school badly needs to hire quality faculty to fill the void in both teaching and research"

OVERVIEW:
Current program offerings place considerable strain on the Faculty's teaching resources resulting in the issues mentioned in the external review. To be specific, in 2013/14 the Beedie School offered 508 course sections (390 undergrad and 118 graduate) with 82 faculty members. Of these sections, 54% were covered by continuing faculty (tenure track and lecturers). Accreditation requirements (AACSB) require a sustainable minimum of 60% of course sections to be covered by faculty members. This leaves the Beedie School with three choices – increase the number of faculty, decrease the number of sections, or increase overload teaching. Each option is discussed below.

6.1 ANALYSIS:
- The School would need to add between 8 and 10 additional tenure track positions to cover the 32 sections needed to meet the AACSB benchmark of 60% research-active instructors. The budget required to accomplish this (salary, benefits and research support) would be approximately $2M on a continuing basis.
- The School would need to eliminate 54 sections (from 508 to 454) if no additional research-active faculty were available. This reduction of 54 sections could be accomplished either through increasing class size or eliminating entire programs.
• Eliminating Course Sections: Assuming that 40 of the 54 sections are cut from the undergraduate program with no decrease in the number of registrations, the average class size increase from 54 students to approximately 63 students per course section. These 40 sections represent an 11% decrease in undergraduate program offerings, thereby triggering significant course access issues since many Business courses are fully subscribed at current levels. The larger class sizes will mean lower services to students, particularly international students with needs for English language training. As a long-term strategy this results in lower program quality, increased course access issues, reduction in student services and a perpetuation of the high student/faculty ratio within the Beedie School - for students paying a 33% premium for these courses.

• Eliminating Programs: Our initial analysis suggests that by eliminating the Undergraduate Business Minor, Aboriginal EMBA, Part time MBA at Surrey and the Undergraduate Entrepreneurship & Innovation Certificate, the Beedie School would save 42 course sections. Eliminating these programs may bring Beedie closer to meeting accreditation standards but will have a severely negative effect on our ability to support existing SFU students (with the minor and the E&l certificate), and the broader community (EMBA ABL and Part Time MBA at Surrey).

- The Faculty is currently in the situation where overload teaching assignments are common, especially in the graduate programs. This is not a viable arrangement going forward, for the following reasons: 1) faculty burnout, 2) potential weakening of research results, and 3) reluctance by SFU to fund overload teaching at market rates. Some overload teaching will always happen but it should not be a core Beedie strategy.

6.2 ACTIONS:

- As a short term response, undergraduate student enrolment has been capped and no new graduate programs will be introduced in the near future.
- A plan is in place to ensure the 2015 Accreditation team sees that the Beedie School is working to address the shortfall.
- We do not plan to immediately reduce the number of courses/sections for 3 main reasons:
  a. SFU is a public, comprehensive University, not a private institution and should be accessible to our local communities. Beedie is already under-responding to the needs of local students. Approximately 20% of undergraduate applications to SFU request Business as their first choice major; yet SFU provides only 6.2% of all new student intake spaces to the Beedie School. Reducing the overall size of our student body, in the face of consistent high demand for Business programs, would further erode our ability to serve the demands and needs of our domestic students.
  b. SFU relies on international students for diversity and also for revenue. Beedie has been asked to take a large share of international students and is working to enable these students to succeed. Lowering the numbers of international students would reduce revenue and reduce Beedie’s ability to pay for support services for all students.
  c. Shrinking the student numbers would result in lower revenue to the Faculty and therefore to faculty or staff being laid off, since 92% of revenue is used for staff and faculty salaries and benefits. The remainder of the budget is almost entirely used to provide premium services to students and support services to international students.
- The Faculty has requested an increased share of tuition fees for both premium fees (undergrad and grad) and international tuition fees. The principle being used for this argument are
  o Students who pay premium fees are paying more for general university services than regular students
  o Premium services are entirely provided by the Faculty, therefore, all of the premium tuition should flow to the Faculty.
6.3 RESOURCE IMPLICATIONS (IF ANY):

- Eliminating strategic programs or increasing class sizes are unpalatable solutions to a faculty shortage problem. They negatively affect the School, our students, and the wider community.
- To maintain AACSB accreditation and lessen the current faculty overstretch situation, Beedie will need to hire between 8 and 12 new professors and lecturers. This will reduce the overload teaching and overuse of sessionals and PhD students that is currently occurring. This hiring is in addition to the need to replace retiring faculty.
- To accomplish this hiring, increased allocation of tuition resources is necessary. The Faculty cannot operate on less than 45% of the tuition revenue when government grants are not increasing.

6.4 EXPECTED COMPLETION DATE/S:

- FAM changes are being discussed in June 2015; these changes are not under the control of the Faculty. If changes to FAM are accepted, the Beedie faculty complement can be increased over the next 3 years.
- If changes to FAM are not accepted, programs will need to be eliminated and services to existing students will need to be decreased accompanied by a decrease in the staff the number of programs and increase in the number of students per section. This strategy will take 2-3 years to implement.

The above action plan has been considered by the Faculty under review and has been discussed and agreed with the Vice-President, Academic.

Dean (signed)  

Date  

Aug 5 /2015
Section 2 - VPA's comments and endorsement of the Faculty Action Plan:

Preface
I agree that the Beedie School of Business needs some assistance in managing its programs and budget. Current data indicate that BSB expenditures per student (weighted or unweighted) are higher than all other Faculties. This suggests that there are some efficiencies to be made, and I am already working with Beedle to suggest some changes. At the same time, I recognize the importance of accreditation to business schools, and I recognize that it is necessary to pay higher salaries to attract good faculty members. I will be providing some bridge funding to bring faculty numbers up to the suggested levels, and to give the Faculty a breathing space to find efficiencies and new sources of revenue. The bridge funding will commence in the 2016/17 fiscal year, and will be spread over a number of years.

I will comment on a number of statements in the action plan that suggest that the Beedie School of Business is somehow competing with other Faculties, the University or the VP Academic for resources. All areas of the university are working to provide students with the best possible education and experience, to support internationally recognized research, and to build relationships with diverse communities. This requires us to work collaboratively and to recognize that no units will receive enough resources to do everything that they would like. All academic units benefit from being part of a larger university, and Beedie both benefits from, and contributes to, this collective effort.

Undergraduate programs
The proposal to stabilize undergraduate enrollments and cap the % of international students is sensible. The changes to the program to better serve EAL students are welcome (it should be noted that this benefits many domestic students as well as international students).

Graduate programs
Discussions are underway about Beedie's share of revenues for these programs. It should be noted that in other Faculties it is normal for research faculty members to manage graduate programs with minimal assistance. The recent implementation of a number of online processes by the Dean of Graduate Studies should result in some efficiencies. Beedie should take a hard look at the administrative costs of their programs.

Research
Although the external review and comparative data from other business schools suggest that Beedie performs well in research, I note that research revenues per full-time research faculty member are lower in Beedie than any other Faculty. This reduces opportunities for students to participate as paid research assistants. Beedie should be taking advantage of a wider variety of funding opportunities and should aim to bring the dollars per faculty member at least to the level of comparable units, such as Education and FASS.

Engagement and Administration
It is appropriate that SFU's business school be at the forefront of community engagement, and Beedie is exemplary in maintaining productive relations with its alumni and in offering current students many networking opportunities outside the university.
Working environment
I agree that better communication across the three campuses is needed; I believe there is an excellent fundraising opportunity to upgrade equipment in the Segal graduate school.

Accreditation and faculty renewal
I have dealt with some of the resource issues at the start of this document.
Beedie School of Business
Education Goals Assessment Plan

Submitted By: Dr. Blaize Homer Reich, Dean, Beedie School of Business
Date: September 1, 2015.

History of Assessment
The Beedie School of Business has a well-established assessment process. As a result of our AACSB accreditation, the Beedie School began to formalize its assessment endeavors in 2010 with the development of learning goals, objectives and rubrics. Our assessments are driven by, and congruent with, Beedie’s mission statement and core values.

Levels of Assessment
The Beedie School of Business’s Education Goals Assessment Plan consists of Education Goals at the following levels:

- Undergraduate Program Level: measured in five core courses that all Bachelor of Business Administration (BBA) students take as part of their degree
- Undergraduate Concentration Level: goals were established for each of the eight concentrations in Business. Measurements are taken from courses specific to that concentration as developed and decided upon by the discipline area.
- Graduate Program Level: goals were established for each program at the Graduate level and measured in specific program courses and projects. For newly launched programs, goals are in draft form.
- PhD Level: goals were established for the PhD program holistically. Measures are taken from exams and proposals.

Measurements were first taken at the beginning of the 2010/2011 academic year. Since this time, changes have been made to both the process and the goals used to guide assessment of students learning. The updated goals and processes are outlined in the following sections.

Education Goals
Educational Goals and Learning Objectives for the Undergraduate program have been mapped to courses that cover the respective goal whereas objectives for graduate programs are mapped to capstone courses for the MBA, MOT-MBA and EMBA. Educational objectives have been mapped to individual courses within the MSc Finance and PhD programs. (The attached learning goals are those being employed for measures as of summer 2015 for the above programs or concentrations).
Goals at each level tend to differ based on the program goals and objectives. However, broad Education Goals, specifically at the BBA program level, can be defined as competencies in:

1. Global Perspectives
2. Ethical Perspectives
3. Critical thinking
4. Communication skills
5. Legal knowledge
6. Core business skills, and
7. Disciplinary knowledge.

Timeline
Based on the frequency of course offerings and program structure, different timelines for the education goal measurement and assessment cycle are taken into account. For example, the undergraduate program is measured at a more frequent rate each semester based on the combined use of formative and summative measurements. Graduate programs are run as cohorts that vary in length from 12 months to 5 years (PhD) and are measured and assessed on a longer cycle with most programs concentrating on summative measurements conducted in capstone courses.

Measurements for all levels are requested following each semester provided the specific measurement area (course, project, or exam) was offered during that time period.

Assessment Design
The Beedie School of Business uses a four-point scale for educational assessment purposes. Instructors complete an evaluation for each student using developed rubrics and course embedded direct measurements. These evaluations are used to indicate whether students are able to demonstrate that they exceed expectations, meet expectations, approach expectations, or fail expectations on a particular rubric trait. In assessing students in this way, the information gathered assists the School in determining where course improvements, topic sequencing, or programmatic changes may be necessary. This is done at formative and/or summative levels depending on the chosen approach for each program.

At the undergraduate and graduate levels, instructors evaluate students based on individually developed course rubrics using existing embedded assignments or exams. Some graduate level educational goals are measured using simulation based exams.

Measurement results and course rubrics are reviewed on an on-going basis. To facilitate the assessment process, Beedie has a formal committee structure used to review assessment results and make recommendations to programs and areas based on learning outcomes. The committees are the Assurance of Learning Undergraduate Committee and the Assurance of Learning Graduate Committee. Feedback from users on rubrics and measurement processes and input from the Assurance of Learning Committees, governing area or academic director on results and trends in student learning are used to
inform needed changes in rubrics, measurement processes, course content, or program support for students.

As of Fall 2015, the benchmark for all Education Goal assessments was raised to 75%. Therefore, results of 'Meets Expectations' or 'Exceeds Expectations' should account for 75% or more of the students measured for an acceptable student performance on defined education goals.

The course embedded assignments used for measurement should bear at least 10% or more weight on a student's overall course grade and the data is collected for all students completing those assignments.

Future Assessment Plans for the Beedie School
As Beedie continues to measure students' learning, we anticipate the following:

1. The 75% benchmark will provide better evidence of areas where students are meeting or exceeding expectations and areas where improvements in process, pedagogy or content are required. Data collection employing the 75% benchmark will continue over the next academic year to determine trends in student performance and will be used to guide and support any decisions taken.

2. The Assurance of Learning Committees will continue to monitor results. At least once in the next five years, all programs and areas of concentration will be asked to assess whether there is new disciplinary knowledge that needs to be included in the goals. If changes are made, then measures will be used to assess our students' learning relative to the new knowledge.

3. Finalization of the EMBA-ABL education goals and objectives that were revised during 2014/2015 will move on to the process of course mapping and rubric development.
# Beedie School of Business

## Learning Goals - Programs & Areas of Concentration

### Undergraduate

#### BBA Core

<table>
<thead>
<tr>
<th>BBA Core Education Goals</th>
<th>Measured In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Global Perspective</td>
<td>All objectives measured in BUS 478</td>
</tr>
<tr>
<td>Goal 2: Ethical Perspective</td>
<td>All objectives measured in BUS 303</td>
</tr>
<tr>
<td>Goal 3: Critical Thinking</td>
<td>BUS 478 (Qualitative), BUS 336 (Quantitative)</td>
</tr>
<tr>
<td>Goal 4: Communication Skills</td>
<td>BUS 360 (Written), TBD (Oral)</td>
</tr>
<tr>
<td>Goal 5: Core Business Knowledge</td>
<td>All objectives measured in BUS 478</td>
</tr>
<tr>
<td>Goal 6: Disciplinary Business Knowledge</td>
<td>*see Learning Goals for each of the eight BBA concentrations</td>
</tr>
<tr>
<td>Goal 7: Legal Knowledge</td>
<td>All objectives measured in BUS 393</td>
</tr>
</tbody>
</table>

#### BBA Accounting

<table>
<thead>
<tr>
<th>Accounting Concentration Education Goals (2015-06-16)</th>
<th>Measured In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Students will understand that professional accountants need to be ethical and act in socially responsible ways.</td>
<td>All objectives measured in BUS 426</td>
</tr>
<tr>
<td>Goal 2: Students will demonstrate problem-solving abilities supported by technical skills and professional judgment.</td>
<td>All objectives measured in BUS 424</td>
</tr>
<tr>
<td>Goal 3: Students will have proficiency in written and oral communications to communicate effectively with key stakeholders.</td>
<td>All objectives measured in BUS 421</td>
</tr>
<tr>
<td>Goal 4: Students will demonstrate an understanding of the changing nature of the global business environment and be able to recommend reasonable solutions in uncertain situations.</td>
<td>Objective 4.1 and 4.2 measured in BUS 420 Objective 4.3 measured in BUS 426</td>
</tr>
<tr>
<td>Goal 5: Students will demonstrate the technical skills to formulate, use, and interpret accounting and auditing-related information.</td>
<td>Objective 5.1 measured in BUS 321 Objective 5.2 measured in BUS 420</td>
</tr>
<tr>
<td>Goal 6: Students will demonstrate accounting and auditing-related research skills sufficient to identify professional pronouncements, standards, and thinking regarding current issues in accounting.</td>
<td>All objectives measured in BUS 421</td>
</tr>
</tbody>
</table>
### BBA Entrepreneurship & Innovation

<table>
<thead>
<tr>
<th><strong>Entrepreneurship &amp; Innovation Concentration Education Goals (2015-03-03)</strong></th>
<th><strong>Measured in</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1:</strong> Explore opportunities(^1) through identifying and validating customer(^2) needs.</td>
<td>All objectives measured in BUS 477.</td>
</tr>
<tr>
<td><strong>Goal 2:</strong> Demonstrate knowledge of the requirements, options and tools available for resourcing an opportunity.</td>
<td>All objectives measured in BUS 314.</td>
</tr>
<tr>
<td><strong>Goal 3:</strong> Create/Present/Sell a comprehensive model/offering that communicates essential elements of an opportunity to multiple audiences (e.g. client/stakeholder/investor/team members, etc.)</td>
<td>All objectives measured in BUS 477.</td>
</tr>
</tbody>
</table>

### BBA Finance

<table>
<thead>
<tr>
<th><strong>Finance Concentration Education Goals (2014-01-06)</strong></th>
<th><strong>Measured in</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1:</strong> Introduce students to bond and stock investing.</td>
<td>All objectives measured in BUS 315.</td>
</tr>
<tr>
<td><strong>Goal 2:</strong> Introduce students to derivative securities, their role in investments and risk management, and their pricing.</td>
<td>All objectives measured in BUS 316.</td>
</tr>
<tr>
<td><strong>Goal 3:</strong> Learn the tools of corporate finance.</td>
<td>All objectives measured in BUS 413.</td>
</tr>
</tbody>
</table>

### BBA Human Resource Management

<table>
<thead>
<tr>
<th><strong>Human Resource Management Concentration Education Goals (2015-03-04)</strong></th>
<th><strong>Measured in</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1:</strong> HRM graduates will understand the complexities of organizational design.</td>
<td>All objectives measured in BUS 374.</td>
</tr>
<tr>
<td><strong>Goal 2:</strong> HRM graduates will understand how organizations function, succeed and evolve.</td>
<td>All objectives measured in BUS 374.</td>
</tr>
<tr>
<td><strong>Goal 3:</strong> HRM graduates will understand how organizations connect to their environment.</td>
<td>All objectives measured in BUS 374.</td>
</tr>
<tr>
<td><strong>Goal 4:</strong> Graduates will understand how to meet HR requirements.</td>
<td>All objectives measured in BUS 381.</td>
</tr>
<tr>
<td><strong>Goal 5:</strong> Graduates will understand the changing legal emphasis within HR activities.</td>
<td>All objectives measured in BUS 381.</td>
</tr>
<tr>
<td><strong>Goal 6:</strong> Graduates will understand employment engagement strategies used by HR.</td>
<td>All objectives measured in BUS 381.</td>
</tr>
</tbody>
</table>
### BBA International Business

<table>
<thead>
<tr>
<th>International Business Concentration Education Goals (2014-02-26)</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Demonstrate knowledge of the institutional, political and economic environments as they affect the conduct of business across international boundaries.</td>
<td>All objectives measured in BUS 346</td>
</tr>
<tr>
<td>Goal 2: Gain knowledge of the influence of cultural and social values and norms on behavior in different national settings, including Canada.</td>
<td>All objectives measured in BUS 346</td>
</tr>
<tr>
<td>Goal 3: Demonstrate knowledge of the cross-border activities of firms e.g., intra-firm trade, finance, investment, technology transfers, and offshore services.</td>
<td>All objectives measured in BUS 346</td>
</tr>
<tr>
<td>Goal 4: Acquire knowledge on the steps involved in choosing the right entry mode as well as effectively managing these entry modes once the decision has been made.</td>
<td>All objectives measured in BUS 434</td>
</tr>
<tr>
<td>Goal 5: Demonstrate knowledge of the strategies and structures that firms adopt to compete effectively in the international context.</td>
<td>All objectives measured in BUS 434</td>
</tr>
<tr>
<td>Goal 6: Develop presentation skills that are crucial assets for any student considering a career in international business. This is achieved through case and project presentations.</td>
<td>All objectives measured in BUS 432</td>
</tr>
</tbody>
</table>

### BBA Management Information Systems

<table>
<thead>
<tr>
<th>Management Information Systems Concentration Education Goals (2011-07-15)</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Students will be able to de-compose a business system into its components.</td>
<td>All objectives measured in BUS 362.</td>
</tr>
<tr>
<td>Goal 2: Students will understand how to assess the contribution of information technology to business strategy, and they will know how to analyze the requirements for associated organizational resources.</td>
<td>All objectives measured in BUS 468.</td>
</tr>
<tr>
<td>Goal 3: Students will be able to communicate clearly and persuasively with stakeholders.</td>
<td>All objectives measured in BUS 468.</td>
</tr>
</tbody>
</table>
### BBA Marketing

**Marketing Concentration Education Goals (2013-09-13)**

<table>
<thead>
<tr>
<th>Goal 1: Analyze market opportunities through research and quantitative and qualitative analysis.</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1.1 and 1.4 measured in BUS 447</td>
<td></td>
</tr>
<tr>
<td>Objective 1.2 measured in BUS 443</td>
<td></td>
</tr>
<tr>
<td>Objective 1.3 measured in BUS 345</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal 2: Target market analysis and selection based on an understanding of customer behaviour.</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 2.1 measured in BUS 347</td>
<td></td>
</tr>
<tr>
<td>Objective 2.2 measured in BUS 345</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal 3: Position products/brands for competitive advantage.</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objectives measured in BUS 446</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal 4: Develop and use the marketing mix to achieve the selected competitive position.</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives 4.1 and 4.5 measured in BUS 446</td>
<td></td>
</tr>
<tr>
<td>Objective 4.2 measured in BUS 444</td>
<td></td>
</tr>
<tr>
<td>Objective 4.3 measured in BUS 448</td>
<td></td>
</tr>
<tr>
<td>Objective 4.4 measured in BUS 443</td>
<td></td>
</tr>
</tbody>
</table>

### BBA Operations Management

**Operations Management Concentration Education Goals (2014-02-28)**

<table>
<thead>
<tr>
<th>Goal 1: Our graduates will understand the strategic role of operations management and its competitive advantage for organizational survival.</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1.1 measured in BUS 474 and 475</td>
<td></td>
</tr>
<tr>
<td>Objectives 1.2 and 1.3 measured in BUS 474.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal 2: Our graduates will understand the criteria and methods involved in designing, managing, and improving operations.</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objectives measured in BUS 473.</td>
<td></td>
</tr>
</tbody>
</table>
**Graduate**

**FT MBA**

<table>
<thead>
<tr>
<th>MBA Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Communication Skills</td>
<td>BUS 718 Industry analysis paper</td>
</tr>
<tr>
<td>Goal 2: Enlightened</td>
<td>BUS 718 Industry analysis paper</td>
</tr>
<tr>
<td>Goal 3: Integrative Thinking</td>
<td>BUS 718 CAPSIM Comp-XM</td>
</tr>
</tbody>
</table>

**PT MBA**

<table>
<thead>
<tr>
<th>MBA Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Communication Skills</td>
<td>BUS 722</td>
</tr>
<tr>
<td>Goal 2: Enlightened</td>
<td>BUS 722</td>
</tr>
<tr>
<td>Goal 3: Integrative Thinking</td>
<td>BUS 722</td>
</tr>
</tbody>
</table>

**EMBA**

<table>
<thead>
<tr>
<th>EMBA Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Critical Thinking and Communication for Leadership</td>
<td>BUS 696 Project, BUS 652 Presentation</td>
</tr>
<tr>
<td>Goal 2: Strategic Management</td>
<td>BUS 696 Project</td>
</tr>
<tr>
<td>Goal 3: Innovative Strategic Planning</td>
<td>BUS 696 Project</td>
</tr>
<tr>
<td>Goal 4: Responsible Management</td>
<td>BUS 652</td>
</tr>
<tr>
<td>Goal 5: Global Perspective</td>
<td>BUS 696 Project</td>
</tr>
</tbody>
</table>

**EMBA ABL**

<table>
<thead>
<tr>
<th>EMBA ABL Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Develop advanced business knowledge and skills in the context of challenges and opportunities facing Aboriginal Nations, communities and other organizations.</td>
<td>TBD</td>
</tr>
<tr>
<td>Goal 2: Understand stages of development of new organizations with multiple goals and people who need to grow into new roles and responsibilities.</td>
<td>TBD</td>
</tr>
<tr>
<td>Goal 3: Understand the legal, ethical, economic, governance and strategic dimensions of changing relations between Aboriginal and other organizations.</td>
<td>TBD</td>
</tr>
</tbody>
</table>
### MOT-MBA

<table>
<thead>
<tr>
<th>MOT-MBA Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Think strategically in terms of framing and analyzing business problems and opportunities</td>
<td>BUS 780 Project</td>
</tr>
<tr>
<td>Goal 2: Communicate clearly, concisely, and persuasively in written contexts</td>
<td>BUS 780 Project</td>
</tr>
<tr>
<td>Goal 3: Choose rationally and transparently between strategic alternatives</td>
<td>BUS 780 Project</td>
</tr>
<tr>
<td>Goal 4: Understand business ethics and corporate social responsibility</td>
<td>BUS 780 Project</td>
</tr>
<tr>
<td>Goal 5: Identify opportunities and strategies to create and capture value</td>
<td>BUS 780 Project</td>
</tr>
</tbody>
</table>

### MScF

<table>
<thead>
<tr>
<th>MScF Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Learn how to use advanced statistical/financial modeling software</td>
<td>BUS 801</td>
</tr>
<tr>
<td>Goal 2: Analyze the statistical properties of financial time series</td>
<td>BUS 803</td>
</tr>
<tr>
<td>Goal 3: Evaluate equity investments</td>
<td>BUS 805, BUS 809, BUS 865</td>
</tr>
<tr>
<td>Goal 4: Understand valuation models for derivative securities, and related hedging and replication methods</td>
<td>BUS 814, BUS 818</td>
</tr>
<tr>
<td>Goal 5: Value fixed income instruments</td>
<td>BUS 810</td>
</tr>
<tr>
<td>Goal 6: Understand legal and ethical aspects of investments and risk management</td>
<td>BUS 824, BUS 866</td>
</tr>
<tr>
<td>Goal 7: Communicate clearly and professionally</td>
<td>BUS 870</td>
</tr>
</tbody>
</table>

### PhD

<table>
<thead>
<tr>
<th>PhD Education Goals</th>
<th>Measured in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Gain rigorous disciplinary knowledge and ability</td>
<td>BUS 991 Comprehensive Exam</td>
</tr>
<tr>
<td>Goal 2: Acquire relevant interdisciplinary knowledge</td>
<td>BUS 991 Comprehensive Exam</td>
</tr>
<tr>
<td>Goal 3: Develop fluent, persuasive scholarly writing skills</td>
<td>BUS 992 Written Dissertation Proposal</td>
</tr>
<tr>
<td>Goal 4: Possess convincing and engaging presentation skills</td>
<td>BUS 992 Oral Dissertation Proposal</td>
</tr>
</tbody>
</table>
MEMORANDUM

ATTENTION: Senate

FROM: Peter Keller, Vice-President, Academic and Provost, and Chair, SCUP

RE: External Review Mid-Cycle Report for the Department of Mathematics (SCUP 16-01)

DATE: January 12, 2018

TIME

At its January 10, 2018 meeting, SCUP reviewed the Mid-Cycle Report for the Department of Mathematics which resulted from its 2014 external review. The report is attached for the information of Senate.
The External Review of the Department of Mathematics was undertaken in February 2014. As per the Senate guidelines, the Unit is required to submit a mid-cycle report describing its progress in implementing the External Review Action Plan. The mid-cycle report, together with a copy of the Action Plan approved by Senate, and the mid-cycle report on the Unit’s assessment of its Educational Goals are attached for the information of SCUP.

c: Mary-Catherine Kropinski, Chair, Department of Mathematics
    Claire Cupples, Dean, Faculty of Science
Date: November 30, 2017

Attn: Glynn Nicholls, Director, Academic Planning and Quality Assurance

Subject: Mid Cycle Review Documents

Attached please find the Mid-Cycle Report for the Department of Mathematics which details our progress with the Action Plan stemming from the 2014 External Review. The assessment of our Educational Goals is also attached.

Mary Catherine Kropinski, PhD
Chair, Dept of Math
<table>
<thead>
<tr>
<th>Action</th>
<th>Progress Made</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Programming</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1.1.1 Undergraduate</strong></td>
<td></td>
</tr>
<tr>
<td>• Industrial Math Program (i.e., Operations Research, OR) in Surrey: The department will investigate the advantages and drawbacks of bringing this program to the Burnaby campus. If the department recommends moving the program to the Burnaby campus, we will bring forward a proposal. Proposal by April 2015.</td>
<td>In 2015, the Department had plans to hire a research faculty member in OR and thereby reinforce the OR program in Surrey; however, this position was frozen due to budgetary restrictions. Since that time, Science has cut back other programs in Surrey, most notably decommissioning the lower-level cohort programs and moving the MSSC program to Burnaby. The Operations Research Program has not grown for the past few years and currently has very few students. In this context, the Department is again investigating whether to rebase this program in Burnaby, with a final decision anticipated in January 2018. If it is decided that the OR program should move, the current space issues for the Department (item 5 below) would become even more pressing, because there is no space available in Burnaby to accommodate the research faculty associated with the program.</td>
</tr>
<tr>
<td>• Joint Major programs: Discussions have started with Economics on a joint ECON/MATH major. We intend to collaborate with the Department of Statistics and Actuarial Sciences on creating a joint MATH/STAT major. If successful, programs should go into calendar by December 2015.</td>
<td>On track for September 2018.</td>
</tr>
<tr>
<td>• Honours program: The department is redesigning its honours program. The new requirements will include a project component. Summer term research opportunities that already exist for our top students would naturally provide content for such projects. April 2015. First cohort to start under the new program in Fall of 2015.</td>
<td>The Honours program now has a thesis requirement. Students complete a 16-week research internship, and then write a 30-page thesis document and give a 20-minute oral presentation. These requirements are evaluated in the 5 credit MATH 499. It has been offered each fall since 2015. Alongside this, students take MATH 498 which is a mathematical communication and research methods course. Students are walked through the process of transforming their research into written and oral communications. They receive feedback on their documents, and learn basics of public speaking. Six students have completed their thesis so far, with five more enrolled this fall (2017).</td>
</tr>
<tr>
<td>Review and tweaking of undergraduate course content:</td>
<td>SFU-developed notes have been produced and introduced to the biology calculus stream (math 154, 155). The local production involved consultation with the biology departments. A similar initiative involving the SIAT program in Surrey is underway.</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>In addition to a general review suggested by the committee, we have proposed an initiative where we consult home departments of our service course students to integrate examples from courses in their program into our service courses. Spring 2016 (and ongoing).</td>
<td></td>
</tr>
</tbody>
</table>

### 1.1.2 Graduate

| Pure Math Graduate Program: A faculty committee will review and update course offerings and degree requirements for the pure math graduate degrees. March 2015. | The requirements of the MSc Pure Mathematics specialization were modified with a goal of emphasizing core courses to better build a cohort, and to ensure enrolment in core courses. Specifically, the breadth requirement was made explicit, and students must have courses from a certain selection. Reading courses are more carefully vetted to avoid dilution of the core courses, a problem that was identified in the review. A new faculty in pure math, Nathan Ilten, has increased the graduate algebra offerings, with a selection of graduate courses in algebraic geometry. These courses are in high demand, are very popular, and have had a positive effect on graduate recruitment. |

| Pure Math Grad Qualifying Exam: A committee of two including the pure math graduate program chair will propose modifications to the current exam format, or a new exam format. March 2015. | The previous exam, MATH 898 was replaced with two shorter, more focused exams. The first, MATH 895, explicitly concentrates on core topics expected to be mastered from undergraduate. The topics are aligned with our undergraduate offerings, and the questions are comparable to exam questions students in our 300-level courses might encounter. The second exam, MATH 896 is a topics exam and will contain questions from the student's broad area of research. The last offering of MATH 898 is Spring 2018, and the single remaining student of that regime will write the exam. Aside from him, the remaining... |
students fall under the new requirements, with MATH 895/896. The first offering is expected for Summer 2018. A GSC subcommittee is actively preparing the exam this semester.

- **M.Sc. for High School Teachers**: Teaching faculty are looking into redeveloping a previously submitted proposal for an M.Sc. directed at Math teachers, and will bring a proposal to the department. Likely a hybrid on-line and class-based course, with class meetings on Saturday. Proposal by September 2015.

   This was looked at further and it was found that we would be competing with existing successful online offerings and that it would be difficult to meet the staffing requirements.

### 2. Research

- **The Department will work on a strategic research and hiring plan with a five- to ten-year horizon. First draft by December 2014, plan by March 2015. The department feels that our current hiring plan is a good basis. It remains a departmental priority to hire candidates who show excellence in their field, who have a high level of interest in teaching, and who will make good colleagues.**

   A five-year strategic research and hiring plan is expected to be developed as a part of the 2018-2023 Academic Planning exercise.

### 3. Administration

- **"Faculty exchanges" between Surrey and Burnaby**: This is an excellent suggestion in the external review report. The department will propose such a program. It touches on workload issues, so the plan will need the Dean's approval. December 2014.

   Consideration of such a program will be delayed until a decision is made about where to base the OR program. We are currently examining mechanisms to get more Burnaby-based faculty to teach in Surrey. This will be put in place for the 2018-2019 teaching assignments.

- **Academic Advising**: The review report commended the department for creating this position. The scope of this position has expanded considerably. The incumbent is involved in a host of teaching related and outreach activities. Our department serves thousands of students (about 10,000 course enrollments per year), and we have a host of initiatives aimed at improving learning outcomes for struggling students, while trying to offer more challenging

   The role and job description of the Advisor was reviewed in October 2017 due to new hiring. The Advisor continues to participate in the planning and coordination of recruitment, orientation and student success initiatives.

   The Advisor also supports and consults with the department undergraduate studies committee on curricular matters.

June 2017
The department wants to review our current set-up, change the job description of the Advisor position to more accurately reflect the scope of the role in our department, which goes beyond traditional advising. Detailed proposal by December 2014.

### 4. Working Environment
- n/a

### 5. Space

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tr>
<td>Space constraints have become a major issue in our Department. Our programs and demand for service teaching is growing; however, we have no space to accommodate new faculty, nor fill our teaching and graduate training needs. We have insufficient space for graduate students, visitors and postdocs, and the space we do have is fractured into isolated pockets. It is virtually impossible to house research groups in a cohesive fashion. These issues were greatly exacerbated when the Big Data Hub took over the IRMACS facility. The Dean of Science’s office has initiated a consultation with Facilities to examine our current space holdings and make recommendations. It is unknown when this process will be completed.</td>
<td></td>
</tr>
<tr>
<td>Subject to evaluation (see above).</td>
<td></td>
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</tbody>
</table>

- Individual office space: Split AQ 4100 (current Q-Workshop) into 5 individual offices. This will allow us to create office space contiguous to our K10500 hallway. If a temporary home for the Q-workshop can be found, completion by December 2014 or April 2015 is possible. |

- Math Student Support Centre in WMC: Proposal to create a student learning hub in WMC, featuring two workshops, one computer lab, and an open collaborative space. April 2015, ready for use for summer 2015 term. |

[math west] facility in the WMC had a soft opening in summer 2017. Fall 2017 was the first full usage term. The social learning space houses the relocated Q-workshop, some of the calculus support sessions, and graduate discussion groups. The MACM 316 computing office hours are now much more effective now that they are hosted in the collaborative computing space with MATLAB-enabled equipment. The advanced learning space houses both tutorials for MACM 316 and MATH 310 (8-10 tutorials in total) and several of our upper division courses. The open-
area office hours in the community zone have been deemed successful. The 3-term usage plan has roughly 75% pre-scheduled events, with an increasing amount of spontaneous usage becoming part of departmental habit.

<table>
<thead>
<tr>
<th>Student Lounge (&quot;Math Hangout&quot;): We are proposing to designate the open study space west of our Algebra Workshop (AQ4135) as a &quot;Math Hangout&quot;, open to all students, encouraging students to engage with each other, and as a meeting point for working together on math homework assignments. There is a precedent for this sort of arrangement at the Beedie School of Business. December 2014.</th>
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<td>Math Student Union Lounge: The current space is shared between Math (MSU), Statistics and OR students. It would be nice to open up this space more and make it more inviting, for example by replacing some of the west wall with a glass wall. Proposal for a minor &quot;face-lift&quot;. December 2014.</td>
<td>Student representatives from both Math and Stats consulted with a space planner from facilities this fall. Renovations are due to start next spring. Planned completion: May 2018.</td>
</tr>
<tr>
<td>Geographic unification of graduate student space: It is difficult to imagine a solution to this problem within existing buildings at SFU. One idea is to add another level to the Math/Stats wing of SCK; clearly this would be a major capital project requiring significant financial resources. No specific date, something to keep in mind for a longer time horizon.</td>
<td>Subject to evaluation (see above).</td>
</tr>
</tbody>
</table>
Introduction
Being one of the first departments to go through this process, we were initially overly ambitious.
Since our proposal in 2013, we have edited our Educational Goals and streamlined the program
assessment plan.

The only significant change to the Educational Goals is the removal of an emphasis on team work.
We recognize this is an important skill but at present we do not have many appropriate places in the
curriculum to include this. Instead we are currently focussing on enhancing communication skills.
Wholesale change throughout the department is infeasible: each class feeds content into the next in a
highly-structured way, and the content of so many of our classes is required by other departments.
For instance, only six (MATH 208, 240, 242 and 252 and MACM 203 and 204) of our about 60 annual
lower division course offerings typically have more than 15% math majors.

Our original proposal for program assessment had each performance indicator scored on a 0-4 scale
for each student. This was eventually deemed too onerous to properly implement, and it was
somewhat contentious. We have now moved to a Y/N indicator based only on course curricula. If the
typical B student is expected to be successful on a given indicator the course is scored Y for that
indicator. This means our preliminary assessment was done on courses and programs, and not on how
students perform in the courses they choose. We shall address this issue before the next review.

Educational Goals
Mathematics is a mature discipline with very structured programmes. There are no external standards
bodies imposing Educational Goals or Learning Objectives. We have settled on the following non-
controversial Goals:

1) Graduates will be able to solve mathematical problems with mathematical techniques.
2) Graduates will be able to state, use and prove mathematical theorems.
3) Graduates will be able to formulate mathematical problems from plain language descriptions.
4) Graduates will be able to use software to formulate and solve mathematical problems.
5) Graduates will be able to communicate mathematical information effectively.

The first three are essentially the common themes of mathematics degree programmes as identified in
the EU Tuning document\(^{11}\), the fourth a requirement for the modern application of mathematical
techniques and the final an oft overlooked necessary skill for all graduates.

To identify whether our programs are meeting these goals we map the curriculum to the following
indicators:

1) Graduates will be able to solve mathematical problems with mathematical
techniques.
- understands notation
- can identify relevant mathematical techniques
- shows proficiency in basic skills and concepts (eg 1xx and 2xx)
- shows proficiency in advanced skills and concepts (eg 3xx and 4xx)
2) Graduates will be able to state, use and prove mathematical theorems.
- knows definitions
- can identify and state relevant theorems
- can use known theorems to prove auxiliary results
- can conceive of and develop a proof
3) Graduates will be able to formulate mathematical problems from plain language descriptions.
- can proceed in a systematic manner
- can translate word problems into mathematics
- can model a complex situation
4) Graduates will be able to use software to formulate and solve mathematical problems.
- understands basic programming
- can modify existing code to solve a new problem
- can combine existing codes to solve complex problems
- can write short programmes to solve given problems or test concepts
- can use software to generate graphics for the analysis and communication of quantitative information
5) Graduates will be able to communicate mathematical information effectively.
- can effectively communicate mathematical information in writing
- can effectively communicate mathematical information verbally
- can create and use graphics to communicate mathematical information
- can effectively communicate quantitative information in an appropriate form

We have chosen to focus on fairly high level skills rather than discipline specific ones as our department has a broad range of programs covering many disparate areas of mathematics and we do not want to have distinct Educational Goals and Performance Indicators for different Majors.

Communication Skills
Our initial finding was that all our degree programs score very well on Goals 1 and 2, all at least acceptably on 3 and 4 and all needing additional effort towards goal 5. Far fewer classes than expected had an emphasis on communications skills with many assuming it was being done elsewhere.

We have four regularly offered upper division W-labelled courses:

MATH 208W - Introduction to Operations Research
MATH 380W - History of Mathematics
MATH 480W - The Art and Craft of Problem Solving
MATH 402W - Operations Research Clinic

The second course develops skills in writing about mathematics and mathematicians in a manner somewhat akin to a typical essay writing class, and the third focusses on writing solutions to challenging mathematical contest problems. In the first and last courses, reports are prepared on the modelling and analysis of a real-world operations research problem.

Many of our upper division classes also have poster presentations. We are currently working to standardize this practice and determine in which courses poster presentations would be suitable.

We identified that we had no class preparing our students for the communications requirements of graduate school nor for communicating technical results to a general audience. To rectify this gap, we developed MATH 498 - Communication and Research Skills in the Mathematical Sciences (taken alongside enrolment in the Honours Thesis), and we introduced report writing into MACM 316.

MATH 498 is a course for Honours students who have completed a research semester and teaches them how to write up and present their results. It has been an outstanding success leading to students being more competitive for fellowships and our graduate students are now asking for a similar class.

MACM 316 is taken by many of our majors but the class enrolment is dominated by students from Engineering Science and Computing Science. This course teaches students about using and analyzing algorithms to solve problems on the computer. Despite having enrolments well over 100 each semester, we now require students to write a one page report per week describing their solution to a given problem. The goal is to teach students to write about technical matters aimed at a non-technical audience.

Recently we have run MATH 381W - Mathematics Undergraduate Seminar - as a communications-focused selected topics class. We are currently investigating how to make this a regular offering with a fixed topic.

Lastly, an instructor recently ran an experimental version of MATH 345 in a flipped format with students making regular presentations. This also worked very well, and we are examining how to offer such a course again.

Summary and Future Plans

In summary, we identified deficiencies in the teaching of communication skills to our students. We have sought to remedy this by introducing a new course, a new report writing requirement and testing out a flipped format, presentation-focused class.

We will now look at actual student pathways through our programmes to ensure all future students are exposed in to communications-focused classes in the future. We hope to do this by extending the report writing introduced in MACM 316 to other classes and standardize poster or other
presentations in certain 300 and 400 level classes. We are not interested in developing more W-
labelled classes but rather to make communication a component of as many of our classes as possible.

Additionally, we will provide more opportunities for students to learn about using mathematics in
industry (such as by offering MATH 208W in Burnaby), providing more computing experience to
more of our students and revisiting teamwork. The latter two objectives can now be combined in the
new [math west] teaching facility.

Quality Assurance
Program assessment is done to assist departments to continually improve their programs but also to
maintain the highest educational standards. In the mathematics department, we do this by starting
with the notion that no one owns classes. Most service courses are managed by Lecturers who look
after the administration of the class, typically set the lecture schedules and, in some cases, set some of
the homework. Textbooks are chosen by the curriculum committee. These measures help ensure that
different offerings of the same class are as uniform as practical between different semesters and
instructors. At the upper division, sequences for math majors are organized by groups of people who
regularly teach classes in the sequence. They discuss requirements and curricula, while the textbook
options are left to the instructor. People wishing to teach Selected Topics courses need to petition the
curriculum committee explaining what they intend to do.

Mathematics is a very structured discipline with each course building on many preceding ones.
Assessing student performance is thus simpler and less controversial than in many other fields.
Written exam results are an effective proxy for student ability.

Reference
[1] - The document "Reference Points for the Design and Delivery of Degree Programmes in
Mathematics" was prepared as part of the EU Tuning process whereby universities across the EU
developed a common framework for degrees. Tuning is described as “a Process, an approach to (re-
)designing, develop, implement, evaluate and enhance quality first, second and third cycle degree
programmes”.
(http://www.unideusto.org/tuningeu/images/stories/key_documents/tuningmathematicsfinal.pdf)
MEMORANDUM

ATTENTION: Mary Catherine Kropinski, Chair, Department of Mathematics

FROM: Glynn Nicholls, Director, Academic Planning and Quality Assurance

RE: External Review Mid-Cycle Report for the Department of Mathematics

DATE: June 12, 2017

As per Senate guidelines, the Department of Mathematics is to report on progress being made in the implementation of the Action Plan that resulted from its external review in February 2014. This report will be presented to SCUP and Senate for information. The Chair will be asked to attend the SCUP meeting to provide comment and answer any questions about the update on the Action Plan. The Dean may choose to attend the meeting at her discretion.

In addition, as per the agreement with Senate, mid-cycle reports in 2017, following the requirement to develop Educational Goals for programs in the Department of Mathematics, are expected to have conducted an assessment of those goals/outcomes. Please include as part of this mid-cycle report submission a 2- to 4-page narrative description articulating the assessment process undertaken by the academic unit, and any changes or adjustments to the established educational goals, the assessment process, and/or the program curriculum that may have arisen as a result of the findings of the assessment. Should you require any assistance in preparing this part of your report, please contact your Educational Consultant from TLC.

Please submit your progress report, using the attached template, by Thursday, November 30, 2017 to Bal Basi at bbasi@sfu.ca. Also attached, for ease of reference, is the Action Plan that was approved by Senate on November 3, 2014.

Please contact me at 2-6702, glynn_nicholls@sfu.ca, or Bal Basi at 2-7676, bbasi@sfu.ca, if you have any questions or concerns regarding the external review update process.

Thank you.

Attach.

cc: C. Cupples, Dean, Faculty of Science
EXTERNAL REVIEW – ACTION PLAN

Section 1 – To be completed by the Responsible Unit Person e.g. Chair or Director

<table>
<thead>
<tr>
<th>Unit under review</th>
<th>Date of Review Site visit</th>
<th>Responsible Unit person</th>
<th>Faculty Dean</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATHEMATICS</td>
<td>Feb 19-21, 2014</td>
<td>Manfred Trummer</td>
<td>Dr Claire Cuppies</td>
</tr>
</tbody>
</table>

Notes
1. It is **not** expected that every recommendation made by the Review Team be covered by this Action Plan. The major thrusts of the Report should be identified and some consolidation of the recommendations may be possible while other recommendations of lesser importance may be excluded.
2. Attach the required plan to assess the success of the Educational Goals as an addendum (Senate 2013).
3. Should any additional response be warranted, it should be attached as a separate document.
4. [Recommendation Am.n, and page x]: refers to External Review report, Appendix section “m”, bullet point “n”, “page x” to the appropriate page in the main part of the report.
5. *Italic underline blue font:* Quotes from the external review report.

1. PROGRAMMING

1.1 Action/s (description what is going to be done):

1.1.1 Undergraduate:
- Industrial Math Program (i.e., Operations Research, OR) in Surrey. (*"Allow faculty to make an application to be re-based at Burnaby and to be approved or denied within the current academic year (to take place the following year)."") *Recommendation A1.1, and page 2* The department will investigate the advantages and drawbacks of bringing this program to the Burnaby Campus. If the department recommends moving the program to the Burnaby Campus, we will bring forward a proposal. Proposal by April 2015.
- Joint Major programs. (*"We recommend consideration of creation of joint majors to attract and better prepare students (math/cs for example)."") *Recommendation A3.3, and page 8* Discussions have started with Economics on a joint ECON/MATH major. We intend to collaborate with the Department of Statistics and Actuarial Sciences on creating a joint MATH/STAT major. If successful, programs should go into calendar by December 2015.
- Honours program. (*"We recommend financial support for honors students for summer undergraduate research." *) *Recommendation A3.4, and page 8* The department is redesigning its honours program. The new requirements will include a project component. Summer term research opportunities that already exist for our top students would naturally provide content for such projects. April 2015, First cohort to start under the new program in Fall of 2015.
- Review and tweaking of undergraduate course content. (*"In some cases faculty should consider slight modifications to courses*)
that would make them more accessible to students from other departments” - page 8, last paragraph of “Undergraduate Programs] In addition to a general review suggested by the committee we have proposed an initiative where we consult home departments of our service course students to integrate examples from courses in their program into our service courses. Spring 2016 (and ongoing).

1.1.2 Graduate:

- Pure Math Graduate Program. [“We recommend the “pure” math group re-consider its graduate course offerings and requirements in order to offer a wider spectrum to the students, and to better use the expertise of the faculty.” Recommendation A3.2, and page 5] A faculty committee will review and update course offerings and degree requirements for the pure math graduate degrees. March 2015.

- Pure Math Grad Qualifying Exam. [“The qualifying exams of the “pure” group need restructuring as the students (and the faculty) uniformly thought the current setup is not good. Faculty may wish to discuss alternatives with the students in order to improve the overall experience.” Recommendation A3.2, and page 7] A committee of two including the pure math graduate program chair will propose modifications to the current exam format, or a new exam format. March 2015.

- M.Sc. for High School Teachers. [“...we were especially impressed by their one-week teacher summer camps. We believe there is a significant opportunity for a more substantial professional degree or accreditation here.” page 5] Teaching faculty are looking into redeveloping a previously submitted proposal for an M.Sc. directed at Math teachers, and will bring a proposal to the department. Likely a hybrid on-line and class based course, with class meetings on Saturday. Proposal by September 2015.

1.2 Resource implications (if any): Bringing the OR program to the Burnaby Campus would likely go hand-in-hand with all or most of the Surrey based research faculty members moving to Burnaby. This requires office space for faculty members and graduate students. Without space commitments, such a move is not feasible. A consequence might be the need for another lecturer position in Surrey. The external review mentioned a “Faculty in Residence” program for Surrey, which would also carry some cost. For the review of course content in our service courses we feel that this could best be handled as part of a Limited Term Lecturer Position. The M.Sc. program for High School Teachers is expected to recover cost.

1.3 Expected completion date/s: listed above
2. RESEARCH

2.1 Action/s (what is going to be done):

- The Department will work on a strategic research and hiring plan with a five to ten year horizon. (["We recommend the department (with an eye to considering its strengths, the university’s strengths, and where mathematics opportunities are today) create a 5--10 year proactive strategic hiring plan."] Recommendation A3.1, and pages 4-5) First draft by December 2014, plan by March 2015. The department feels that our current hiring plan is a good basis. It remains a departmental priority to hire candidates who show excellence in their field, who have a high level of interest in teaching, and who will make good colleagues.

2.2 Resource implications (if any):

No resource implications for the plan, but there will be for the implementation.

2.3 Expected completion date/s: First draft by December 2014.

3. ADMINISTRATION

3.1 Action/s (what is going to be done):

- "Faculty exchanges" between Surrey and Burnaby. (["We recommend the university consider establishing a Professor in Residence position such that a faculty member from the Burnaby campus would spend a semester, or more, on the Surrey campus teaching."] Recommendation A1.4, and page 3) This is an excellent suggestion in the external review report. The department will propose such a program. It touches on workload issues, so the plan will need the Dean’s approval. December 2014.

- Academic Advising. (["We applaud the fact that the department now has a student advisor who is working to better understand and link to the students. We think it is critical to track the students – in particular to have clear data on where the students go after graduation. This may suggest better or new programming for the department. The department report mentions the “borrowed” space that the current advisor uses; a more permanent (accessible and visible) space solution must be found for the advisor."] page 8) The review report commended the department for creating this position. The scope of this position has expanded considerably. The incumbent is involved in a host of teaching related and outreach activities. Our department serves thousands of...
students (about 10,000 course enrollments per year), and we have a host of initiatives aimed at improving learning outcomes for struggling students, while trying to offer more challenging options to our top students. The department wants to review our current set-up, change the job description of the Advisor position to more accurately reflect the scope of the role in our department, which goes beyond traditional advising. Detailed proposal by December 2014.

3.2 Resource implications (if any):

- "Faculty exchanges": Workload implication of one course per year per exchange, a total of two courses. Implication for the sessional budget roughly $16,000 per year.
- Academic Advising. Our proposal may ask for extra staff resources, or result in a new type of instructional coordinator position at possibly a higher classification. Cost of APSA position reclassification.

3.3 Expected completion date/s:

WORKING ENVIRONMENT

4. SPACE (OTHER)

5.1 Action/s:

"We recommend creation of an undergraduate student lounge. Ideally, contiguous to this space, "permanent" housing for the student advisor. We recommend the geographic unification of the graduate students' offices. We recommend that the Dean and Provost investigate a constructive way of assigning space, perhaps trading spaces with other units." Recommendations A2.1 (as well as A2.2 and A2.3).
Individual office space: [−related to Recommendation A1.1, A2.1, and page 3] Split AQ 4100 (current Q-Workshop) into 5 individual offices. This will allow us to create office space contiguous to our K10500 hallway. If a temporary home for the Q-workshop can be found, completion by December 2014 or April 2015 is possible.

- **Math Student Support Centre in WMC.** *([page 8]*) Proposal to create a student learning hub in WMC, featuring two workshops, one computer lab, and an open collaborative space. April 2015, ready for use for summer 2015 term.
- **Student Lounge (“Math Hangout”).** *([Recommendation A2.1, and page 3 and 8]*) We are proposing to designate the open study space west of our Algebra Workshop (AQ4135) as a “Math Hangout”, open to all students, encouraging students to engage with each other, and as a meeting point for working together on math homework assignments. There is a precedent for this sort of arrangement at the Beedie School of Business. December 2014.
- **Math Student Union Lounge.** *([Recommendation A2.1]*) The current space is shared between Math (MSU), Statistics and OR students. It would be nice to open up this space more and make it more inviting, for example by replacing some of the west wall with a glass wall. Proposal for a minor “face-lift”. December 2014.
- **Geographic unification of graduate student space.** *([Recommendation A2.2, and page 11]*) It is difficult to imagine a solution to this problem within existing buildings at SFU. One idea is to add another level to the Math/Stats wing of SCK; clearly this would be a major capital project requiring significant financial resources. No specific date, something to keep in mind for a longer time horizon.

5.2 **Resource implications (if any):** For the “Math Hangout” minor cost for furniture and possibly some screens for collaboration. The WMC space renovation will likely cost around $1,000,000. Conversion of the Q-space: $120,000. MSU Lounge: $15,000. Major building project would be in the 8-10 Mio Dollar range (IRMACS was about 6 Mio$).

5.3 **Expected completion date/s:**

The above action plan has been considered by the Unit under review and has been discussed and agreed to by the Dean.

<table>
<thead>
<tr>
<th>Unit Leader (signed)</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Name ...Manfred TRUMMER...</td>
<td>.....June 16, 2014.................................</td>
</tr>
</tbody>
</table>
Section 2 - Dean’s comments and endorsement of the Action Plan:

In general, the Review Team has done an excellent job of identifying the main challenges facing the Department of Mathematics, and the department has developed a thoughtful response. I support the direction that the department is taking, and look forward to helping it continue on its successful trajectory.

Two of the biggest issues facing the department are the lack of space on the Burnaby campus and the future of math service teaching and math programs on the Surrey campus. The two problems overlap. I am committed to working with Math on the design and financing of additional teaching and workshop space at Burnaby, and on the expansion of desperately needed office capacity. Additional office space will facilitate the move of Surrey-based faculty to Burnaby if the department chooses that option. It is unfortunate that the department is spread out in so many buildings at Burnaby, but there does not seem to be any alternative at this point.

I believe that the department itself is best placed to decide whether or not to relocate the Operations Research program to Burnaby from Surrey. Math service teaching at Surrey could be done by non-research faculty, as is the case with other Science departments, recognizing that there are plusses and minuses to such a solution. Of course, the final decisions may hinge on the University’s choices regarding the future of the Surrey campus in general. In the meantime, I will continue to cooperate with the department to work through these issues.

Devising effective processes for student academic advising continues to be an issue not only in Math but, I would argue, throughout the university. Student and advisor time is often wasted as students shuttle among Student Services, the department where they are doing their major and the departments where they are taking their courses. I and my staff will work with our departments and with Student Services towards solutions.

The Math Department has shown a commendable willingness to partner with other Science departments, particularly the three life science departments where the majority of our program students reside, in better integrating math into the curriculum. The Faculty of Science will help to fund initiatives of this sort through INSPIRE.

Faculty Dean

Date 30 July 2014
PROGRAM ASSESSMENT PLAN FOR THE MATHEMATICS DEPARTMENT

This document was prepared part of our self-study document for the 2014 departmental review. The layout of this document is as follows:

- Our interpretation of the SFU program assessment process.
- A brief description of our process.
- Preliminary findings.
- A plan for assessing and improving our programs over the next 7 years.


Many universities and professional programs have very detailed requirements for program assessment, course level learning outcomes and data collection. SFU currently has none. Because we are early in this process individual departments are encouraged to develop their own ideas about what to do and how to do it.

We have endeavoured to develop a process which is:

(1) Sensible. (i.e. in line with our goals and not overly time consuming to implement and manage.)

(2) Defensible to our external peers.

(3) Useful for us to measure and improve the areas of our programs we care about.

(4) Open to input from all interested department members.

We have chosen to develop the same educational objectives for all our programs but allow each to have different performance expectations. We will gather only grade-determined data in our large classes but individualized data for our small math major classes. Lastly, we have developed course level learning objectives only for service classes, classes taught by many different people and core mathematics classes. This corresponds to about 15 classes.
Part 2. Educational Objectives

We focus only on the mathematics programs we coordinate: Math major, Math Honors, Applied Math major and Applied Math Honors. Later, we will work with other departments on our joint programs. Some aspects of our performance indicators will be able to be measured in the service classes.

We have chosen objectives which are in line with the broad University goals, the Faculty of Science Degree Learning Expectations and our own strengths.

**Educational Objectives for the mathematics department**

1. Students are able to solve mathematical problems with mathematical techniques.
2. Students are able to state and prove mathematical theorems.
3. Students are able to formulate mathematical descriptions of real-world problems.
4. Students are able to use mathematical software to formulate and solve mathematical problems.
5. Students are able to communicate effectively in oral, written and graphical forms.
6. Students are able to collaborate and work in teams.

The first three are not particularly contentious and are essentially identical to the common goals of all EU mathematics departments as set out in the EU Tuning document.

The fourth is a recognition of the importance of computing in modern mathematics, something our department values more strongly than many.

The last two are soft skills that are important for all students to develop over their time with us. It is not clear that the format of most of our classes clearly support these yet.

*At the moment I would speculate that we succeed on 1 with all students, 2 with most, 3 and 4 with some and any that meet 5 and 6 are an accident.*

1. Performance indicator rubrics

The level of detail here is a balance between workload and utility. Typically we would do “small” classes on a per student basis and large classes by simply totaling grade columns.

In all cases we will grade success on a four point scale. For small classes we will include a brief descriptor.

We want to use the same rubrics at all levels so that we can track progress through the program so some indicators supersede others. For instance, any student who can...
model complex systems systematically can translate word problems into mathematical language.

These rubrics will be used to generate spreadsheets or webforms by front office staff. Large classes could be done automagically from submitted grade data and some input from professor. Small classes could be done through canvas. With some foresight and planning this could be made consistent and as low impact as possible.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Proceed in a systematic manner</td>
<td>unable</td>
<td>With guidance</td>
<td>Without guidance</td>
<td>Ready for Grad school</td>
</tr>
<tr>
<td>Solve problems in Analysis or DEs</td>
<td>unable</td>
<td>With guidance</td>
<td>Without guidance</td>
<td>Ready for Grad school</td>
</tr>
<tr>
<td>Solve problems in discrete math or Graph Theory</td>
<td>unable</td>
<td>With guidance</td>
<td>Without guidance</td>
<td>Ready for Grad school</td>
</tr>
<tr>
<td>Solve problems in an application area</td>
<td>unable</td>
<td>With guidance</td>
<td>Without guidance</td>
<td>Ready for Grad school</td>
</tr>
</tbody>
</table>

Table 1. Rubrics for: Students can solve mathematical problems with mathematical techniques.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>F/D</th>
<th>C</th>
<th>B</th>
<th>A</th>
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<tbody>
<tr>
<td>Proceed in a systematic manner</td>
<td>-</td>
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</tr>
<tr>
<td>Solve problems in Analysis or DEs</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Solve problems in discrete math or Graph Theory</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Solve problems in an application area</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2. Rubrics for: Students can solve mathematical problems with mathematical techniques.
Table 3. Rubrics for: Students are able to formulate mathematical descriptions of real-world problems.

Table 4. Rubrics for: Students are able to use mathematical software to formulate and solve mathematical problems.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication of information and ideas verbally</td>
<td>incoherent</td>
<td>some clarity</td>
<td>considerable clarity</td>
<td>clarity and confidence</td>
</tr>
<tr>
<td>Communication of information and ideas in writing</td>
<td>incoherent</td>
<td>some clarity</td>
<td>considerable clarity</td>
<td>clarity and confidence</td>
</tr>
<tr>
<td>Communication of information and ideas graphically</td>
<td>incoherent</td>
<td>some clarity</td>
<td>considerable clarity</td>
<td>clarity and confidence</td>
</tr>
<tr>
<td>Spelling and grammar</td>
<td>Many errors</td>
<td>Some errors</td>
<td>Few errors</td>
<td>No errors</td>
</tr>
</tbody>
</table>

**Table 5.** Students are able to communicate effectively in oral, written and graphical forms.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>F/D</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication of information and ideas verbally</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Communication of information and ideas in writing</td>
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<td>-</td>
</tr>
<tr>
<td>Communication of information and ideas graphically</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spelling and grammar</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 6.** Rubrics for: Students are able to collaborate and work in teams.
2. Program Goals

Each of our programs has different targets for the performance indicators.

<table>
<thead>
<tr>
<th>Targets for Math Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Objective</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>(3)</td>
</tr>
<tr>
<td>(4)</td>
</tr>
<tr>
<td>(5)</td>
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<tr>
<td>(6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Targets for Math Honors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Objective</td>
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<tr>
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</tr>
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<td>(2)</td>
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<td>(3)</td>
</tr>
<tr>
<td>(4)</td>
</tr>
<tr>
<td>(5)</td>
</tr>
<tr>
<td>(6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Targets for Applied Math Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Objective</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>(3)</td>
</tr>
<tr>
<td>(4)</td>
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<tr>
<td>(5)</td>
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<td>(6)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Targets for Math Honors</th>
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<tbody>
<tr>
<td>Learning Objective</td>
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<td>(3)</td>
</tr>
<tr>
<td>(4)</td>
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<tr>
<td>(5)</td>
</tr>
<tr>
<td>(6)</td>
</tr>
</tbody>
</table>
Part 3. Course level learning objectives

We have chosen to specify formal learning outcomes for:

1. **Service Classes.** To share with the departments whose students we are teaching.
2. **Courses taught frequently and by many different instructors.** To ensure uniformity across offerings.
3. **Core classes taken by all our majors.** For consistency and clarity as these classes are linchpin requirements for many other classes.

These categories lead to about 16 classes, fewer than half our classes but most of our teaching seats.

See the Appendix for sample Learning Outcome lists.

Once these have all been collected, we will ask the following questions:

1. What, if any, educational objectives does this class impact? (*Curriculum Mapping.*)
2. Does this class appropriately cover the material assumed by later classes? (*Learning outputs.*)
3. Are the pre-requisites sensible? (*Learning inputs.*)

We also want to ensure that pre-requisites make sense given that courses slowly shift over time.

To do this, we start by simply constructing a flowchart of what classes are currently required and flow these chains back to 1xx classes. On the next page there is a chart for a portion of the math program. From this we can determine whether the pre-requisite material assumed covered actually is and is done in appropriate detail. This can be done as part of determining learning outcomes at a course level, part of the curriculum mapping for educational objectives or independently. A sample of this is on the following page.
Figure 1. Flowchart leading to most 4xx classes taken by Applied Math students.
Lastly, it is important to consider what grades mean at different levels. We consider both typical habits and levels of mastery.

**Significance of Grade Levels for 1xx and 2xx classes**

**A level:** An A level grade indicates that the student has achieved the course aims with only minor gaps, and is completely ready to proceed to higher-level courses using this material without additional preparation. A students are as a rule highly consistent in meeting deadlines and performing well on midterms, and generally strive to keep up with the material. A students can typically do all assigned work with no assistance and are aware when they do not understand something.

**B level:** A B level grade indicates that the student has grasped the main ideas of the course, with some noticeable gaps, and is not clear on some of the harder concepts. Basic errors will be present, though not pervasive. A B student will typically find it difficult to apply the material in the course to new situations. The B student is ready to take on subsequent courses using this material but can expect to have to review certain portions of the material to be able to attain a similar grade. B students are usually exhibit minor inconsistencies on assignments, for example not finding time to get assistance in a timely way, and usually reveal some weaknesses in background in assignments, tests and exams. B students recognize that they do not completely understand but not always precisely where their problem lies.

**C level:** A C level grade shows major gaps in understanding some important material, and consistent weakness in applying basic ideas even in known situations. Basic errors will be common. C students will typically find subsequent courses extremely difficult, and are at risk in those courses unless they do substantial additional work. C students often struggle to meet deadlines and often submit work that is incomplete or even miss assignments altogether. Weaknesses in background are common and often extensive. C students are often confused on what they understand and what they do not and tend to imagine they “can make it up later”.

**D Level:** A D level grade shows major gaps and weaknesses across the board, and is indicative of not being ready to proceed to further material related to the course content. Student success typically decreases as the term progresses.

**F level:** Students receiving an F for the course will have failed to grasp large portions of the material and have mastered virtually nothing, will consistently make basic errors even in prerequisite material, and in general will not be able to give any coherent account of any significant topic studied. F students typically will have failed to do assignments in a timely way or will have been consistently poor on regular work. They also generally show weak performance in tests.
Part 4. Implementation details

Given that SFU departmental reviews happen at most once every seven years a simple schedule for this process would be:

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-14</td>
<td>Develop draft objectives &amp; indicators</td>
<td>Consult with department</td>
<td>Curriculum Map</td>
</tr>
<tr>
<td>2014-15</td>
<td>Collect: Goals 1 &amp; 2</td>
<td>Collect: Goals 1 &amp; 2</td>
<td>Analyze Goals 1 &amp; 2</td>
</tr>
<tr>
<td>2015-16</td>
<td>Collect: Goals 3 &amp; 4</td>
<td>Collect: Goals 3 &amp; 4</td>
<td>Analyze Goals 3 &amp; 4</td>
</tr>
<tr>
<td></td>
<td>Evaluate success for 1 &amp; 2</td>
<td>Report to dept. on 1 &amp; 2</td>
<td>Modify</td>
</tr>
<tr>
<td>2016-17</td>
<td>Collect: Goals 5 &amp; 6</td>
<td>Collect: Goals 5 &amp; 6</td>
<td>Analyze Goals 5 &amp; 6</td>
</tr>
<tr>
<td></td>
<td>Evaluate success for 3 &amp; 4</td>
<td>Report to dept. on 3 &amp; 4</td>
<td>Modify</td>
</tr>
<tr>
<td>2017-18</td>
<td>Collect: Goals 1 &amp; 2</td>
<td>Collect: Goals 1 &amp; 2</td>
<td>Rate progress</td>
</tr>
<tr>
<td></td>
<td>Evaluate success for 5 &amp; 6</td>
<td>Report to dept. on 5 &amp; 6</td>
<td>Modify</td>
</tr>
<tr>
<td>2018-19</td>
<td>Collect: Goals 3 &amp; 4</td>
<td>Collect: Goals 3 &amp; 4</td>
<td>Rate progress</td>
</tr>
<tr>
<td></td>
<td>Evaluate success for 1 &amp; 2</td>
<td>Report to dept. on 1 &amp; 2</td>
<td>Modify</td>
</tr>
<tr>
<td>2019-20</td>
<td>Collect: Goals 5 &amp; 6</td>
<td>Collect: Goals 5 &amp; 6</td>
<td>Rate progress</td>
</tr>
<tr>
<td></td>
<td>Evaluate success for 3 &amp; 4</td>
<td>Report to dept. on 3 &amp; 4</td>
<td>Modify</td>
</tr>
</tbody>
</table>

Modify here could mean tweak course or some aspect, change objectives or performance indicators. There might be nothing to do.

Once the learning outcomes are in place they do not need to be re-examined on a regular basis. Only when new courses are added, or some taken away, if problems are identified when looking at program objectives and when preparing a self-study report for external review.

Assessment of the performance objectives will be performed by the curriculum committee with assistance of the departmental advisor and undergraduate secretary. The learning outcomes for individual classes will be distributed to all instructors teaching that class as well as those teaching pre- and co-requisite and follow-on classes. The workshop coordinators will ensure that the learning outcomes for their classes are closely followed and that grades are set in accordance with the accepted departmental guidelines.
3. Appendix: Sample Course Level Outcomes Documents

In this section we include examples of the kind of outcomes that are generated for individual courses. These include two major service courses (Math 150 and Math 190) and two core courses (Math 240 and 242). These may be taught by a wide variety of instructors and the outlines are already standardized. These outcome lists aim to ensure that both instructors and students are aware of the objectives in light of the outlines. For Math 150 an outline is included.
Math 150

Description: Designed for students specializing in mathematics, physics, chemistry, computing science and engineering. Recommended for students with no previous knowledge of Calculus. An extensive review of polynomial, rational, logarithmic, exponential, and trigonometric functions and their properties and graphs. Limits, continuity, and derivatives. Techniques of differentiation, including logarithmic and implicit differentiation. The Mean Value Theorem. Applications of Differentiation including extrema, curve sketching, related rates, Newton's method. Antiderivatives and applications. Conic sections, polar coordinates, parametric curves. Prerequisite: REQ-Pre-Calculus 12 (or equivalent) with a grade of at least A, or MATH 100 with a grade of at least B, or achieving a satisfactory grade on the Simon Fraser University Calculus Readiness Test. Students with credit for either MATH 150, 154 or 157 may not take MATH 151 for further credit. Quantitative

Textbook and detailed list of topics:

Calculus - Early Transcendentals 7th ed., Stewart:

Chapter 1 - Functions and Models
1.1 Four ways to represent a function
1.2 Mathematical Models: A Catalogue of Essential functions
1.3 New Functions from Old Functions
1.5 Exponential Functions
1.6 Inverse Functions and Logarithms

Chapter 2 - Limits and Derivatives
2.1 Tangent and Velocity Problems
2.2 Limit of a Function
2.3 Calculating Limits Using the Limit Laws
2.4 Precise Definition of a Limit
2.5 Continuity
2.6 Limits at Infinity; Horizontal Asymptotes
2.7 Derivatives and Rates of Change
2.8 The Derivative as a Function

Chapter 3 - Differentiation Rules
3.1 Derivatives of Polynomials and Exponential Functions
3.2 Product and Quotient Rules
3.3 Derivatives of Trigonometric Functions
3.4 The Chain Rule
3.5 Implicit Differentiation
3.6 Derivatives of Logarithmic Functions
3.7 Rates of Change in the Natural and Social Sciences
3.8 Exponential Growth and Decay
3.9 Related Rates
3.10 Linear Approximations and Differentials
3.11 Hyperbolic Functions

Chapter 4 - Applications of Differentiation
4.1 Maximum and Minimum Values
4.2 The Mean Value Theorem
4.3 How Derivatives Affect the Shape of a Graph
4.4 Indeterminate Forms and L'Hospital's Rule
4.5 Summary of Curve Sketching
4.7 Optimization Problems
4.9 Newton's Method
4.10 Antiderivatives

Chapter 10 - Parametric Equations and Polar Coordinates
10.1 Curves Defined by Parametric Equations
10.2 Calculus with Parametric Curves
10.3 Polar Coordinates
10.5 Conic Sections
10.6 Conic Sections in Polar Coordinates

Learning outcomes: Upon successful completion of the course, the student will have knowledge and develop intuitive approaches to the following mathematical concepts: infinitesimals, continuity, rates of change and the smoothness of curves. Specifically, the student will be able to:

- Classify functions by their analytical representation (polynomials, rational functions, etc.) and their properties (monotone, continuous, differentiable, etc.)
- State the definition of the limit of a function and calculate limits by using techniques and properties introduced in the course
- Apply limits to find and classify eventual asymptotes
- State the definition of the continuity of a function at a point and on an interval and apply it to decide if a function is continuous or not and to classify eventual points of discontinuity
- State and apply the Intermediate Value Theorem
- State the definition of the derivative of a function at a point and on an interval and apply it to calculate derivatives of functions
- Relate the derivative with the instantaneous rate of change and the slope of the tangent line
- Distinguish the concepts of continuity and differentiability
- Calculate derivatives by using rules of differentiation
- Use linear approximation to estimate a given number
- Solve related rates problems
- Solve one-variable optimization problems
- State and apply the Mean Value Theorem
- Use various calculus techniques and facts to draw a graph of a function
- Use Newton's method to estimate the roots of a function
- State the definition of the antiderivative of a function and find antiderivatives in some simple cases
- Find the derivative of a function given parametrically and draw its graph
- Find the derivative of a function given in polar coordinates and draw its graph
- Distinguish the types of conic sections
Calendar Description:
MATH 190-4 Principles of Mathematics for Teachers
Mathematical ideas involved in number systems and geometry in the elementary and middle school curriculum. Overview of the historical development of these ideas, and their place in contemporary mathematics. Language and notation of mathematics; problem solving; whole number, fractional number, and rational number systems. Plane geometry, solid geometry, metric geometry, and the geometry of the motion. Introduction to probability and statistics.

Learning outcomes:

At the end of the course, successful students should be able to:

- Understand and use mathematics language and terminology correctly;
- Correctly present and explain solutions to mathematical problems;
- Appreciate the need for precision and rigour in mathematics definitions and reasoning that is appropriate for the level of a learner;
- Understand and evaluate mathematical materials related to the elementary school curriculum;
- Understand concepts of quantity and value;
- Use quantitative analysis and other strategies to solve mathematical problems;
- Understand properties of base ten and other numeration systems;
- Understand the concept of place value in base ten and other numeration systems;
- Understand the meaning and properties of whole number operations, various models for these operations and be able to describe situations where various models can be used;
- Understand the meanings and models for fractions;
- Relate fractions, decimals and percents;
- Perform operations on fractions, illustrate these operations using diagrams and deeply understand the meaning of these operations;
- Understand the difference between additive and multiplicative comparisons of quantities;
- Analyze and solve problems that require multiplicative comparisons;
- Understand the concept of divisibility and of a factor and a multiple;
- Understand the concept of prime and composite numbers and their properties;
- Understand and use the Fundamental Theorem of Arithmetic;
- Determine whether the number is prime or composite and represent composite numbers as products of primes;
- Determine GCF and LCM of two or more whole numbers;
- Understand the concept of a geometric dimension;
• Recognize, define and classify a variety of 2D and 3D shapes: lines, planes, angles, circles, spheres, polygons, polyhedra, etc.;
• Understand, describe and classify symmetries of 2D and 3D objects;
• Understand, classify and find images of geometric transformations: isometries and similarities;
• Understand the concept of measure and unit;
• Derive formulas for and calculate areas, surface areas and volumes of basic geometric objects and use appropriate units in these calculations;
• Understand relations between areas and volumes of similar shapes;
• Understand and use Pythagorean Theorem
MATH240: Algebra I: Linear Algebra

Course Level Learning Outcomes

Course Description: Numerous problems of interest in science, engineering, computing science and commerce can be represented by systems of linear equations. This course explores the celebrated Gaussian Elimination algorithm: a general method for computing all solutions to any such linear system, or for detecting that no solutions can exist.

The idea of a matrix is fundamental to this exploration and basic matrix operations are explored: addition, multiplication, transpose, inverse and determinant. Our main focus is on the vector spaces $\mathbb{R}^2$, $\mathbb{R}^3$, and more generally on $\mathbb{R}^n$, in which we discuss elementary operations on vectors, linear independence, spanning sets, bases, the rank of a matrix, orthogonal bases, and the Gram-Schmidt process.

We also study vector spaces in an abstract setting, which brings together in a unified way many of the ideas studied across science. We examine the concepts of linear independence, span, bases, subspaces, and dimension within an abstract vector space. The connection between linear transformations and matrices, as well as the kernel and range of a linear transformation are explored. Eigenvalues, eigenvectors, and eigenspaces are discussed, as well as similar matrices and diagonalizable matrices.

This course emphasizes mathematical proof: students will be presented proofs of the main theorems in linear algebra, as well as construct their own proofs to statements made about the objects studied in this course.

Objectives:

- **Linear Systems**: Student will be able to
  - represent a system of linear equations by a matrix;
  - use the Gaussian Elimination algorithm to compute the general solution to a given system of linear equations or show that no solution exist;
  - prove elementary statements concerning the theory of systems of linear equations;
  - understand some applications of systems of linear equations.

- **Matrix Algebra**: Students will be able to
  - perform the operations of addition, scalar multiplication, and multiplication, and find the transpose and inverse of a matrix;
  - calculate determinants using various methods: row operations, column operations, and expansion down any column and across any row;
  - prove elementary statements concerning the theory of matrices and determinants;

- **Vector Spaces and Linear Transformations**: Students will be able to
  - prove algebraic statements about vector addition, scalar multiplication, inner products, projections, norms, orthogonal vectors, linear independence, spanning sets, subspaces, bases, and dimension for $\mathbb{R}^n$ and abstract vector spaces;
  - understand the relationships between $A$ being invertible, $\det A$, $Ax = 0$ having a solution, the rank of $A$, and the rows of $A$ being linearly independent.
  - apply the Gram-Schmidt process to orthogonalize a basis;
  - compute the kernel, range, rank, and nullity of a linear transformation;
  - determine the matrix associated with a linear transformation with respect to given bases, and understand the relationship between the operations on linear transformations and their corresponding matrices;
- determine the change-of-basis matrix;
- prove statements of an algebraic nature concerning linear transformations.
- compute eigenvalues and their corresponding eigenspaces.
- prove elementary facts concerning eigenvalues and eigenvectors.
- determine if a matrix is diagonalizable, and if it is, diagonalize it.
- prove certain specified theorems given in the course.
MATH 242 LEARNING OUTCOMES
DRAFT

Calendar Description
MATH 242-3 Introduction to Analysis I
Mathematical induction. Limits of real sequences and real functions. Continuity and its consequences. The mean value theorem. The fundamental theorem of calculus. Series. Prerequisite: MATH 152; or MATH 155 or 158 with a grade of B. Quantitative.

Learning Outcomes - Short Version
The student will know the $\epsilon - \delta$ definition of limit together with necessary background about the real numbers, and understands how to apply this appropriately in the context of sequences, functions of a single real variable, and series. The student will learn the definitions and proofs for basic concepts and results that allow a clear understanding of the roots of the differential and integral calculus in the limit definition, and will be familiar with how the main results of first year calculus are proved. Students are also exposed to notions of uniform continuity and uniform convergence and their applications. Throughout the course students will apply the knowledge learned from studying these basic theorems to prove selected simple results from the definitions and theorems. The student will complete the course with a certain level of comfort in doing simple proofs in analysis, including an incipient understanding of how to criticize whether their own proofs are complete, correct, and efficient.

Learning Outcomes - Long Version

(1) Starting from an intuitive idea of what a real number is, the student will understand the ideas of countable and uncountable sets and the fact that the rationals are dense in the reals.

(2) The student will know the least upper bound property in the form that states that monotone bounded sequences of real numbers converge. They will understand the terminology of open and closed sets and of limit points, as they apply to subsets of the reals.

(3) The student will learn the $\epsilon - N$ and $\epsilon - \delta$ definitions of the limit of a sequence and of the limit of a function at a point, will be able to use this definition to prove that certain simple limits have the value that is known from introductory calculus, and to derive the basic properties of limits rigorously.

Date: June 11, 2012.
(4) Students will know the definitions of continuity of a function at a point, and on an interval.
(5) Students will be exposed to the idea of uniform continuity and be aware of the importance of uniformity in the proof of the extreme-value theorem.
(6) Students will know the definition of the derivative of a function, be able to give (with proof) an example of a function that is not differentiable but is continuous at a point, and prove basic theorems (for example the product rule) from introductory calculus.
(7) The statement and proof of the mean value theorem will be known, and students will appreciate the applications of this theorem to the proof of standard facts from first-year calculus.
(8) The definition of the Riemann integral will be known, and the student will be exposed to basic arguments about upper and lower sums, be able to state a criterion on these sums for Riemann integrability and use this criterion to show integrability for some simple functions.
(9) The relationship between differentiability and integrability will be explored, and students will be comfortable with the main ideas of the proof of the fundamental theorem of calculus.
(10) Students are to understand the definition of convergence of infinite series in terms of earlier definitions in the course, and to grasp how this definition and the Cauchy criterion are used to prove some simple convergence tests.
(11) The student will then apply these concepts to series of functions, notably power series, and is exposed to basic ideas about representation of functions as Taylor series.
(12) Students will know the definition of uniform convergence, and understand how to apply it to simple examples to show non-uniformity of convergence.
(13) Students will know that power series are uniformly convergent within their domains of convergence, and understand the relationship of the continuity of the terms of a power series to continuity of the sum.

Throughout the course students will apply the knowledge learned from studying these basic theorems to prove selected simple results from the definitions and theorems. In addition to such proofs involving a small number of steps, students will become familiar with longer arguments and gain practice in identifying key ideas in the proofs of major theorems. The examination will include a combination of repeating known definitions and theorems, proving results and solving problems already studied, and students will be invited to show that they can apply the definitions and theorems in situations that are not identical to those already seen.

A main aim of the course is for the student to understand the relationship between the concepts in the course and the methods of single-variable calculus. To achieve this, students will learn how to use precise definitions of mathematical concepts, how to read and understand theorems and their proofs using such definitions, how to make their own proofs in analysis, and how to criticize whether their own proofs are correct or not.
MEMORANDUM

ATTENTION: Senate

FROM: Peter Keller, Vice-President, Academic and Provost, and Chair, SCUP

RE: External Review of the School of Engineering Science (SCUP 18-04)

DATE: January 12, 2018

At its January 10, 2018 meeting, SCUP reviewed and approved the Action Plan for the School of Engineering Science that resulted from its External Review.

The Educational Goals Assessment Plan was reviewed and is attached for the information of Senate.

Motion:

That Senate approve the Action Plan for the School of Engineering Science that resulted from its External Review.

c: G. Chapman
    E. Fiume
MEMORANDUM

ATTENTION Peter Keller, Chair, SCUP
FROM Wade Parkhouse, Vice-Provost and Associate Vice-President, Academic
RE: Faculty of Applied Sciences: External Review of the School of Engineering Science

DATE December 1, 2017
PAGES 1/1

Attached are the External Review Report and the Action Plan for the School of Engineering Science. The Educational Goals Assessment Plan is included, for information only, with the Action Plan.

Following the site visit, the Report of the External Review Team* for the School of Engineering Science was submitted in July 2017. The Reviewers made a number of recommendations based on the Terms of Reference that were provided to them. Subsequently, a meeting was held with the Dean of the Faculty of Applied Sciences, the Director of the School of Engineering Science and the Director of Academic Planning and Quality Assurance (VPA) to consider the recommendations. An Action Plan was prepared taking into consideration the discussion at the meeting and the External Review Report. The Action Plan has been endorsed by the School and the Dean.

Motion:

That SCUP approve and recommend to Senate the Action Plan for the School of Engineering Science that resulted from its external review.

*External Review Team:

Ivan Fair, University of Alberta (Chair of Review Team)
Winnie Ye, Carleton University
Dayan Ban, University of Waterloo
Joseph Peters (internal), Simon Fraser University

Attachments:

2. School of Engineering Science Action Plan
3. School of Engineering Science Educational Goals Assessment Plan

cc Eugene Fiume, Dean, Faculty of Applied Sciences
Glenn Chapman, Director, School of Engineering Science
Report of the External Review Committee

School of Engineering Science
Simon Fraser University

Submitted
July 8, 2017

Site visit
May 24 – 26, 2017

Review Committee

Ivan Fair
Department of Electrical and Computer Engineering, University of Alberta

Winnie Ye
Department of Electronics, Carleton University

Dayan Ban
Department of Electrical and Computer Engineering, University of Waterloo

Joseph Peters
School of Computing Science, Simon Fraser University
Summary

The School of Engineering Science at Simon Fraser University is at an important juncture. With the accreditation of its undergraduate programs at risk, and with discontent throughout the School for previous actions (perceived or actual) of the University, strategic decisions must be made in order to rebuild a strong, sustainable School.

With new leadership in place at several levels of University administration, there exists a significant opportunity for the School to reestablish its priorities, to work as a unit to fulfill the mission of the School, and to trust that higher levels of administrators will ensure that adequate resources are in place for the School to thrive. There also exists the opportunity for new leaders within the University to rise to the challenge of building a trust-based relationship with the School that will prove beneficial to the School, the Faculty of Applied Sciences, and the University.

Following a brief overview of the current state of the School, this report offers recommendations for concrete steps that the School can take to rise to the current opportunities and rebuild a healthy department. These recommendations, summarized below, fall into three thematic areas.

The School should:

1. Prioritize its undergraduate programs, which should involve measures to:
   - Determine the appropriate size of each undergraduate program, revise admission procedures, and act to reduce attrition
   - Re-examine teaching loads
   - Revisit the proposal for offering electives for other students on campus
   - With strong support from the Office of the Dean, ensure that all faculty members and lecturers become licensed as Professional Engineers
   - Ensure sufficient technical support
   - Ensure sufficient administrative support
   - Hire faculty members into positions already allocated to computer engineering, and then reevaluate the number of faculty members required in the department

2. Build upon the foundation of a solid undergraduate program to:
   - Improve the graduate student experience
   - Continue to focus on quality research
   - Increase collaboration
   - Develop a long-term vision for the School

And while doing so, the School should:

3. Trust the leadership, and to demonstrate this trust through:
   - Active support of the Director of the School
   - Having confidence that the Dean of Applied Sciences will understand and advocate for the true needs of the School, and that the Vice President Academic will be receptive to this input.

A fourth theme comprises recommendations for higher levels of administration within the University to encourage rebuilding of trust-based relationships between their Offices and the School. This will involve listening, honestly considering input from the School, maintaining open lines of communication, and providing resources that will enable the School to offer excellent education and research programs.
The External Review Committee offers these recommendations in the belief that, by reestablishing the fundamental purpose of the School, by working together to meet this mandate, and by placing their trust in the upper level administrators to provide the resources necessary to fulfill this mission, members of the School of Engineering Science will collectively create a cohesive working environment in which they will enjoy educating the appropriate number of undergraduate students, and will continue to build high-quality research programs involving an appropriate number of high-quality, engaged graduate students.

The External Review Committee also believes that higher levels of administration within Simon Fraser University truly want the School to be successful. It is anticipated that increased openness and respect between all levels of administration will be key in making that happen.
Current State

The current state of the School of Engineering Science, as it is perceived internally, is detailed in its extensive self-study report, the details of which are not repeated here. Instead, listed below are major strengths, weaknesses, threats, and opportunities for the School as detailed in the report and as observed during the onsite visit.

Strengths

The primary strength of the School is its people. It has:

- a number of very engaged and committed teachers
- excellent researchers leading innovative research programs
- cross-appointments that offer opportunities for collaboration across departments
- extremely committed administrative and technical support staff
- faculty members who are consistently willing to serve the School as needs arise
- strong, forward-thinking leadership from the current Director
- the promise of positive change from the Office of the Dean under the leadership of the new Dean of Applied Sciences
- involved and determined co-op services staff
- the ability to draw students from the expanding population of the Lower Mainland

Weaknesses

Weaknesses related to educational programs of the School include:

- the resistance of some faculty members to seek registration as Professional Engineers, thus putting the accreditation of the undergraduate programs at risk
- the lack of concern shown by some faculty members regarding the potential loss of accreditation
- low teaching allocations and a corresponding low number of classes offered
- inequitable teaching loads
- feelings of entitlement exhibited by reluctance to contribute to the undergraduate program
- impending retirements of several faculty members
- low numbers of faculty members supporting key programs of the School, such as the computer engineering program

Weaknesses related to infrastructure include:

- lack of space to accommodate undergraduate teaching labs for increased enrollments
- lack of space for student design projects
- lack of space to allow for growth of research programs
- existing spaces that require renovation to improve the working environment

Weaknesses related to the operation of the School include:

- lack of a long-term vision for the School
- overtaxed administrative and technical support staff
- excessive focus on the budget instead of on offering solid education and research programs
- allowing faculty members to sit on the tenure & promotion committee in a year in which they are under review
**Threats**

Severe threats include:

- the real danger that the undergraduate programs will lose their accredited status from the Canadian Engineering Accreditation Board. While two major issues have been overcome in the last year, there remains significant concern with courses containing elements of engineering science and engineering design being taught by instructors who are not registered as Professional Engineers.

- burnout of support staff and some instructors who are giving more of themselves than is healthy. Unsustainable amounts of overtime are currently being invested.

Apparent threats include:

- the budgetary processes in the Faculty Allocation Model. The School feels strongly disadvantaged by this model and believes that, to increase funding to the School, it must increase the number of students enrolled in its courses. It believes that it must do so without adequate resources to take on this increased number of students.

- the reduction in number of faculty members in the last several years. Many members of the School feel that it is not possible to offer strong education and research programs with the current complement.

- the development of programs on the Surrey campus. With Mechatronics and the evolving Sustainable Energy Engineering programs being developed within the Faculty of Applied Sciences, there is a perception that there is a need to compete with these programs for already limited resources.

- a loss of trust in higher-level offices within the University, exhibited by blame for the impact of the current budget model, the reduction in faculty complement, and expected competition with the new programs.

**Opportunities**

Given recent changes in leadership, and in light of the above noted strengths, weaknesses, and threats, it is believed that significant opportunities exist for the School of Engineering Science to rebuild itself into a strong, well-functioning department that will provide solid undergraduate education and excellent opportunities for advanced graduate education and research. To take steps towards fulfillment of these opportunities, it is recommended that the School:

- first focus on offering solid, sustainable undergraduate programs,
- build upon the foundation provided by strong undergraduate programs to continue to offer engaging graduate and research programs,
- and trust the leadership as it navigates and encourages change.

To support this change in focus and mindset, higher levels of administration are encouraged to listen to the School, understand its needs, and do what it can to ensure that the School receives adequate resources as it rebuilds itself into a vital unit within the University. Doing so will reestablish a trust-based relationship that is vital to the well-being of the School, the Faculty, and the University.

Details of these recommendations follow.
Recommendations to the School of Engineering Science

The review committee offers the following recommendations to the School of Engineering Science to encourage positive change that will enable the School to reestablish a firm foundation, regain momentum, and regroup to once again become a cohesive unit that works together for the benefit of the School and the University.

1. Prioritize the undergraduate programs

Regardless of their origin, the primary mission of Canadian engineering programs today is to educate undergraduate students to enter the engineering profession. Graduate student education, research activities, and technology transfer are important, but secondary, aspects of our engineering programs.

It is strongly recommended that the School of Engineering Science actively and mindfully prioritize its undergraduate programs. This will provide an opportunity for the members of the School to rally around the common purpose of offering strong, sustainable undergraduate programs. We recommend that doing so should involve the following actions.

1a. Determine the appropriate size of each undergraduate program, revise admission procedures, and act to reduce attrition

The School wishes to stay on the Burnaby campus, and it is apparent that this is the intention of all levels of administration. However, this will constrain the physical space available for use by the School. In particular, the amount of space for undergraduate teaching labs and design projects will remain limited. Therefore, it is recommended that the School:

(i) determine the number of students in each of the undergraduate programs that can be supported by the physical infrastructure currently available or which will be available in the near future following renovations to the existing building. Space for undergraduate teaching laboratories will likely be a limiting factor.

(ii) revise its admission policies to admit only the appropriate number of students into each of its programs. Emphasis should be on the quality of students, not quantity. In particular it is recommended that revised admission procedures attempt to eliminate the lower portion of the bimodal distribution currently observed in some first year classes.

(iii) implement techniques to reduce attrition of students as they make their way through their undergraduate program. Consideration should be given to increased peer mentoring and increased administrative, instructional and technical support. If the loss of students due to an inability to secure a co-op position increases to a significant level, it is recommended that the policy of requiring a co-op term prior to third year be reexamined.

1b. Re-examine teaching loads

An adequate number of course sections, of reasonable size, must be offered in order to provide a solid undergraduate engineering education. Multiple course offerings are vital to support the flexibility required for students as they take co-op positions. Engineering departments in Canada of a size similar to the School typically require professors to teach four courses per
year. The majority of large electrical and computer engineering departments at large Canadian universities require professors to teach at least three courses per year. While some of these departments have policies that allow a reduced teaching load due to chair positions or large research programs, others do not allow for any such reduction.

It is recommended that the School of Engineering Science re-examine its policy regarding teaching loads with the intention of increasing the teaching load for professors to the equivalent of at least three, and possibly four, courses per academic year. Lecturers should receive a corresponding increase in teaching duties. It is recommended that these increases be reflected in the manner in which performance is assessed during the biennial merit review process.

In making this recommendation it is noted that all courses do not carry an equal workload, and it is recommended that the different workloads associated with different courses be taken into account when allocating teaching duties.

As outlined in recommendation 1e below, it is recommended that this increase in teaching load be accompanied by an increase in support for laboratory instruction in order to allow faculty members to make best use of their abilities and expertise in the classroom. As outlined in recommendation 1g, it is also recognized that an increase in the number of faculty members with expertise in computer engineering will be required in order to support a strong undergraduate program in this area.

An undergraduate program is strengthened by the contributions of all members of the department. Therefore it is recommended that current policies that allow a reduction in teaching be reconsidered, and at the very least, each faculty member be required to teach at least some minimum number of courses in the undergraduate program each year. Not only will this result in improved course offerings for students, it will involve and encourage all faculty members to contribute to the undergraduate programs which form the core mission of the School.

1c. Revisit the proposal for offering electives for other students on campus

The School is considering offering elective courses to students from other Faculties on campus. The motivation for doing so is twofold: (i) to introduce other students to technologies with which they interact every day, and (ii) to increase enrollment numbers to positively impact the budget.

Should positive action be taken on other recommendations in this report to ensure a solid undergraduate education for all students registered in the School, and if resources remain to offer additional courses for out-of-department students, then offering classes to meet the first of the two objectives is welcome. However, it is recommended that such classes not be offered for the primary purpose of increasing funds for other activities of the School. As noted elsewhere in this report, adequate funding of the School should be considered the responsibility of the Dean, and the School is encouraged to focus on offering the strongest programs possible for its own students rather than placing a large emphasis on securing budgetary resources.

1d. With strong support from the Office of the Dean, ensure that all faculty members and lecturers become licensed as Professional Engineers

It is a requirement for accreditation by the Canadian Engineering Accreditation Board that engineering science and engineering design components of engineering programs be taught by Professional Engineers. In some Faculties of Engineering across the country, there is a
requirement for licensure within two years of employment in order to continue in an academic position; in others, it is a requirement for tenure. The criticality of licensure cannot be overstated: it is a fundamental in the accreditation of an undergraduate engineering program, which in turn is the foundation for a strong engineering school in Canada.

It is strongly recommended that the School of Engineering Science and the Faculty of Applied Science increase its encouragement of all faculty and lecturers within the School to become registered as Professional Engineers. This is a direct way in which these individuals can show commitment to the School and its undergraduate programs, and demonstrate that they wish to be part of the team building for the future. Should further motivation be required, it is recommended that the School and Faculty employ measures available to it within the policies of the University to require all faculty members and lecturers become registered with the Association of Professional Engineers and Geoscientists of British Columbia.

1e. Ensure sufficient technical support

Technical support for undergraduate laboratories, design projects, and resources such as the cleanroom is critical to providing a solid and well-rounded engineering education. The current complement of technical support staff is at its limits, and impending retirements will result in inadequate technical support.

In conjunction with right-sizing the undergraduate programs and developing equitable teaching loads for faculty members, it is strongly recommended that the requirements for technical support of the undergraduate program be reviewed to ensure sufficient technical support for students in all the undergraduate labs, with the likelihood of increasing the number of technical support staff members. This is considered to be of higher priority than increasing the number of faculty members.

In reviewing the needs for technical support it is recommended that the best use of teaching resources be considered. It is anticipated that increasing the technical support for undergraduate laboratories might enable faculty members and lecturers to spend less time in the labs and additional time in the classroom, therefore offering more courses.

1f. Ensure sufficient administrative support

Adequate administrative support staff is critical to enabling proper operation of the department as it offers its undergraduate programs, as well as its graduate program and research and service activities. The current complement of administrative support staff is not sufficient to support solid undergraduate programs, to support an innovative graduate program, and to support faculty members as they teach and grow their research programs.

Therefore it is strongly recommended that the number of administrative support staff members be increased. This is viewed as a matter of highest priority, higher than increasing the number of faculty members. As new support staff are hired, existing support staff members are also encouraged to willingly hand off tasks to them.
1g. Hire faculty members into positions already allocated to computer engineering, and then reevaluate the number of faculty members required in the department

The School has recognized the need for additional faculty members with expertise in computer engineering to support its computer engineering program. It has been allocated positions in that area, and has been actively attempting to hire appropriate individuals. It is recommended that the School continue its efforts to hire into these positions.

Once the proper number of students in each program has been determined, the appropriate number of course sections have been created, the number of classes that will be taught by each faculty member has been decided, and adequate administrative and technical support is in place, then consider again the appropriate faculty complement. It is recommended that the teaching needs for each of the programs be considered, taking into account impending retirements. Only if a strong argument can be made that additional teaching resources are required to offer solid undergraduate engineering programs is it recommended that the School advocate to the Dean for additional faculty positions in the areas of greatest need.

2. Build upon the foundation of a solid undergraduate program

Solid undergraduate programs, to which all members of the department are committed and contributing, provide the foundation upon which other aspects of the School can be built. To enable advancement of all aspects of the School, it is recommended that efforts be focused in the following areas.

2a. Improve the graduate student experience

While research is driven by faculty members, it is graduate students that complete the large majority of the research work. Engaged, enthusiastic, high quality graduate students will result in greater overall research achievements. Initiatives that will result in an improved graduate student experience include the following.

(i) increase graduate student funding to levels commensurate with living costs in the Lower Mainland. This can be done through a combination of additional teaching assistantships (which in turn will strengthen the undergraduate program) and increased levels of research assistantships provided by faculty members through their grants. Faculty members are encouraged to focus their funding on fewer, high quality graduate students, in order that their funds will have the greatest impact.

(ii) increase the levels of mentorship such that the maximum duration of graduate programs can be reduced from 4 years to 3 years for Masters programs, and from 8 years to 6 years for Doctoral programs, with the average duration in these programs being significantly less than the maximum allowed.

(iii) consider introducing the requirement for successful completion of a comprehensive or candidacy examination within two years of commencing doctoral studies.

(iv) increase the number of graduate courses offered. This should be done in combination with reevaluating overall teaching loads, and possibly through group teaching approaches. It is noted that at many universities across the country, faculty members often take on additional
graduate-level teaching responsibilities, over and above the required allocation, in order to
to ensure graduate students receive the education needed to advance their research area.

2b. Continue to focus on quality research

Because physical space for the School on the Burnaby campus will remain limited, there exist
constraints on the space available for research. Accordingly, it is recommended that an
emphasis continue to be placed on quality of the research conducted, rather than significantly
expanding the size of the graduate program by increasing the number of graduate students. A
strong, vibrant graduate program with the number of students that space allows will provide the
starting point for growth in the future should additional physical space be made available.

2c. Increase collaboration

While there are significant research collaborations between the School and the Department of
Biomedical Physiology and Kinesiology, and a considerable number of constructive
relationships with members of the School of Computing Science, there are fewer joint efforts
with researchers from other departments, such as in Physics and with those located on the
Surrey campus. In order to take advantage of ideas and insights that come from cross-
disciplinary efforts, it is recommended that researchers build upon existing collaborative
activities and develop even more inter-disciplinary research activities within the School and
across departments.

In particular, as new departments are established in Surrey, it is recommended that they not be
viewed as competitors, but that concerted efforts be made to determine how mutually beneficial
collaborations can be developed, in both teaching and research. It is recognized that the
physical distance between campuses presents a barrier, but it is recommended that attempts be
made to overcome that barrier.

2d. Develop a long-term vision for the School

Given the current state of the School, by necessity this report focuses on recommendations that
will make significant differences in the short term. However, as these short-term issues are
addressed, opportunities will arise to look to the future. It is recommended that the School
participate in long-term planning in order to engage the members of the School in establishing
directions that will lead to strength and success for many years to come.

3. Trust the leadership

There is new leadership at many administrative levels within the University, with additional
changes to take place. This provides the opportunity for the School to build new relationships,
and to encourage and allow new upper level administrators to take leadership positions that will
ensure that the School will be recognized for its important contributions to the University, and
that the resources required for sustainable operation will be made available to the School.
Therefore, members of the School are encouraged to:
3a. Actively support the Director of the School

The External Review Committee was impressed by the leadership shown by the current Director of the School. Since stepping into this role, he has dealt with several difficult issues including the risk of the School losing its accredited status. The Committee is convinced that he is focused on the best interests of the School as he leads it through the difficult process of change. It is strongly recommended that members of the School of Engineering Science band together under his leadership to build a strong foundation of undergraduate education, and upon that foundation, continue to build a strong graduate program and innovative research programs.

3b. Have confidence in the new Dean of Applied Sciences and Vice President Academic

It is strongly recommended that the School trust that the Dean will advocate to the upper levels of administration to ensure that appropriate resources are made available to the School. It is also strongly recommended that the School have confidence that the Vice President Academic and Provost will listen to and work with the Dean to ensure that adequate resources are provided to the Faculty of Applied Sciences and the School of Engineering Science.

Accordingly, it is recommended that with the assistance of members of the School, the Director of the School make strong, cogent arguments to the Dean for the true needs of the School as it builds a strong department on the foundation of strong, sustainable, and accredited undergraduate programs. When doing so, it is recommended that the Director, and the other members of the School, concern themselves less with the budgeting processes involved in the Faculty Allocation Model, and that they instead focus on advocating to the Dean for their defensible needs.

Recommendations to higher levels of administration

In the recommendations above, the review committee is implicitly encouraging higher levels of administration within the University to strive to understand and appreciate the value that the School of Engineering Science can bring to the University. By doing so, these levels of administration will rebuild a trust-based relationship with the School, which is all-important in the proper operation of an academic institution. We now make these recommendations explicit to the Offices of the Dean of Applied Sciences and Vice President Academic and Provost.


Trust is the foundation of well-functioning working relationships. Under previous administrations, trust had diminished between the School of Engineering Science and the Office of the Dean of Applied Sciences and the Office of the Vice President Academic and Provost. With new leadership however, there exists a significant opportunity for the Dean of Applied Sciences and the Vice President Academic and Provost to rebuild a trust-based relationship between their Offices and the School that will benefit not only the School, but will also benefit the Faculty and the University.

Owing to his recent appointment, the new Dean of Applied Sciences has a window of opportunity to build strong rapport with the School should he listen to, engage with, and respectfully accept and consider honest input from the School. This will enable the
development of a relationship that will contrast those between the School and some previous Deans. Accordingly, it is strongly recommended that the Dean take advantage of this opportunity by making a concerted effort to ensure open lines of communication between his Office and the School, and to be as transparent as possible with the School regarding the limitations and successes he encounters. The Office of the Dean of Applied Sciences is also encouraged to rise to the challenge of educating the Office of the Vice President Academic and Provost regarding the needs of the engineering programs in the Faculty.

It is apparent that some members of the School believe that the Office of the Vice President Academic and Provost does not understand or respect their contributions to the University. This presents a significant challenge to the Vice President Academic and Provost: to rebuild a respect-based working relationship between his Office and the School. Accordingly, it is recommended that the Vice President Academic and Provost give thoughtful consideration to the needs of the School as the Dean brings them forward, and that his Office find a way to provide the resources required to support solid engineering programs at Simon Fraser University. If it is not possible to provide the resources requested, then honest, transparent, respectful communication with the School will be important in having its members gain an appreciation of the larger context within which the University must operate.

The External Review Committee is convinced that, with strong leadership at all levels within the University, the School of Engineering Science will have and will seize the opportunity to build and maintain strength in undergraduate engineering education, graduate education, and innovative research.

Our best wishes for success on this journey. While it may prove difficult, we are convinced that it will be worth it.

IF, WY, DB, JP
July 2017
Engineering Science (ENSC) would like to start by thanking the External Review (ER) team for an important outside perspective which will help us improve our program.

Engineering Science is a professional training school - one of a handful of departments at SFU that is subject both to an external accreditation review panel (by the Canadian Engineering Accreditation Board or CEAB) and the SFU mandated External Review both of which occurred in 2017. Thus this action plan must combine the findings of both overlapping reviews into a single response.

It is important to stress that the CEAB has the power to remove the accreditation of an Engineering program if programs do not meet the high standards demanded of all Canadian Professional Engineering programs. Loss of accreditation would effectively kill Engineering Science at SFU. Hence priority must be given to its accreditation requirements. The External Review report tells SFU and Engineering Science how to meet both CEAB requirements and the academic goals of a high quality Canadian university.

An important issue for the CEAB is that Engineering Science has lost 10 faculty since 2010, a 38% decline in faculty to 27.5 full time, but at the same time the undergraduate student population has increased 50% to 1184. This more than doubling of the student to faculty ratio was an important factor in generating concerns in the CEAB accreditation reviews, resulting in a focused visit in 2017. Engineering acted quickly to address outstanding issues, and was allocated 4 new faculty positions, the combination of which resulted in a significantly better review and an extension of engineering accreditation for 3 years. However of particular note is the CEAB review stated that while other issues had been addressed the remaining deficiency was:

“This program has been the subject of previous findings with regards to the low number of full-time faculty. While recruitments are underway for four new faculty positions and a laboratory engineer, there remains a lack of a long-term hiring strategy. This means there currently is no plan to address longer-term requirements.”

These must be addressed by the Fall 2019 CEAB review to retain accreditation.

From both reports it is clear that the problem Engineering Science faces is that the costs of supporting a first rate training program with sufficient faculty, staff and technical support exceeds the amount allocated through the Faculty Allocation Model (FAM). FAM is an activity based model based on the earnings from courses, as generated by AFTEs (Activity Full Time Equivalent) with some modification to take into
account program costs. However engineering courses are expensive to run as almost all of them have hands on experience laboratories attached which require substantial interactions with students. With a pure Faculty Allocation model (FAM) there is no long term sustainable way that Engineering Science can deliver a high quality educational experience to our students. The direct flow-through of the FAM to Engineering Science causes it to be stuck between a rock and a hard place. Reducing the number of students, which is one suggestion in the external review, decreases the departmental FAM budget allocation, which in turn requires a reduction in faculty, staff and laboratory equipment and further reduces the ability to serve the remaining students. Increasing the student numbers (international and domestic) does gain resources, but not enough to cover the costs of additional faculty/staff needed to properly serving additional students. Over the most recent years the Engineering Science budget has been determined almost entirely by the FAM type models. Fortunately there are indications that it will not face a pure FAM model at least at the faculty level in the next year, and last year received an important increase to fund new faculty positions.

It is notable that the External Review considered the challenges facing the department so strong that it concentrated on the undergraduate and graduate programs. Their concern in the research area was the limited nature of the space available for research which restricts faculty abilities to expand their research and their graduate program.

Engineering Science is an excellent contributor to SFU by providing one of the strong professional training programs that are an important part of all the leading Canadian universities. We sincerely hope this report results in actions the department and the university must take to meet those goals.
1. PROGRAMMING

1.1 Action/s (description what is going to be done):

1.1.1 Recommendations Undergraduate

(a) ER and CEAB note the need to recover lost faculty positions to sufficiently meet the undergraduate teaching needs
(b) ER recommends reducing the number of students as an alternative to addressing the lack of space and faculty
(c) ER suggests a focus on increasing student retention
(d) ER suggests examining the teaching load
(e) ER recommends external service courses be considered only if sufficient funding is not available from the FAM model
(f) ER and CEAB both require that all faculty obtain Professional Engineering status
(g) ER recommends ensuring sufficient technical staff

Undergraduate program response

- Searches/interviews are underway for the currently allocated 4 faculty positions. Engineering Science needs about 2 positions a year approved just to replace retiring faculty and must request an additional 3 faculty per year for the next 2-3 years to bring us up to the complement required by the CEAB.

- There is a conflict between the ER recommendations and the CEAB requirements with respect to faculty hiring levels. The ER recommends shrinking the undergraduate admissions to compensate for what both they, and the CEAB, consider the low number of faculty and lack of space (see section 4) especially in programs like computer engineering. It assumes that the dean/administration will bypass the resulting FAM reductions in funding to retain faculty at the levels currently approved. The CEAB however assumes that any reduction in admissions will not occur in any near term and requires an increase in faculty complement, suggesting the lost positions need to be recovered as in point (a). The ER assumes that sufficient funding will be supplied through the Dean's office either by advocating sufficient financial support outside of the FAM from the administration or alternatively by not applying the FAM all the way down to the department level. The current Dean indicates that the FAM allocations will in the future be modified at the department level which could possibly give additional resources to support the department. Considering the CEAB has made it clear that continuation of ENSC engineering accreditation is dependent on continued recovery of the faculty numbers, Engineering Science is requesting that any modification of FAM funding be used to regain the lost faculty positions and replace retirements to meet the expectations of the CEAB. Discussions are ongoing with the Dean and, through him, the administration.

- Additional ways, outside of the normal budget, of funding new positions are being investigated. The department is putting together a plan for attracting First Nations students to engineering and the first step in that is a targeted search for potential First Nations faculty to act as a mentor in the program. The Dean has confirmed that the funds are available that will support a qualified First Nations faculty member for the first 3 years of their stay at SFU. That enables such faculty to help establish a First Nation recruitment plan which would pay for their position at no risk to the department. Another possibility is industrially funded research
chairs which are being actively pursued, for example the recent SAR Chair supported by MDA/CSA or the earlier Sierra Wireless chair.

- Engineering Science is focusing on retaining students in 3 ways. First we have budgeted for a special student help desk for 2018. Modelled after successful programs at universities like MIT this will be supported by 4 TAs and a sessional targeted at supporting all engineering curriculum courses, especially those in the first and second years where student retention is the largest issue. This supplements current course TA support. Secondly ENSC is proposing to move to a partial broad-based admissions plan. This notes that students at the margins of the admission criteria are often the ones getting into trouble in early years. It is planned the mark based admissions threshold be raised but that 20% of admissions be reserved for students that are below that threshold but have demonstrated additional skills that are important for engineering (e.g. Science Fair winners, ham radio operators, skilled programmers, etc.). As part of this engineering will be starting outreach programs to better attract young women and minorities to apply for entrance to Engineering Science. We want to target this at the 2019 admissions if possible. Thirdly ENSC will more closely track the student performance in the classes (e.g. from assignment and midterm marks) to direct those in trouble to additional resources (such as the help desk). We are looking at a Big Data project, and learning analytics opportunities with the Faculty of Education, in this area to identify what factors which can improve retention of first year students.

- The ER suggests reexamining the teaching load which is currently at 2.5 courses per year. Discussions with the ER team indicated what they propose is not a uniform increase but rather the development of a weighting formula that recognizes the effort required to teach courses. Thus courses with large student numbers in labs or high faculty time consuming labs should treated differently than say small specialized lecture-only courses when calculating the teaching load. The weighting formula would increase faculty teaching for those with less demanding courses. In addition the ER noted the reduced teaching loads for faculty with industrial, or CRC chairs, was considerably more generous than NSERC requires. CRC actually only specifies that normally the Chair should devote 50% of their time to research. The department has opened discussions with both the general faculty, on the teaching load formula, and the chairs, on their teaching relief. . This is also targeted at improving the fairness factor in course distribution. Limitations on course buyouts are being implemented, as it is very difficult to find sessional instructors with the P.Eng. status needed to replace faculty, often requiring hiring of expensive visiting faculty instead.

- One proposal the department made was the creation of service course targeted at students outside of engineering. Since the FAM especially works for departments with large service courses this was considered as a way of increasing department budgets to support Engineering programs. Since other engineering universities do not need these service courses to maintain their programs the ER suggested not attempting this as it consumes resources (both faculty and labs) at a time when both are in low supply in the department. Instead it suggests that we trust the Dean/administration that sufficient funds will come so that this action is not needed. However an interesting opportunity has arisen that is consistent with the department strategy, and which has significant potential for a service course. Engineering Science is partnering with SFU’s library to provide courses that support the newly funded library Maker Space project coming in Fall 2018. Engineering will create a course tuned to supporting the maker space (3D printing, laser cutting etc.) for non-engineering students to enable them to make better use of the library facilities. This overcomes the objections the ER raised of the added load on lab space/equipment/lab support and enhances the library’s ability to offer the maker space project. This course, which is planned to be WQB approved, will help connect engineering better to the rest of the university
an important goal of the department, and encourage interfaculty cooperation as the ER recommended in its research section. As a course not targeting engineers this would not require P.Eng. status instructors adding flexibility in teaching. In addition the Dean has tentatively approved set up funds to pay for a sessional for course development and the first offering. Hence the cost to the department is modest while the possible upsides are significant.

• Both the ER and CEAB are concerned that some faculty have not yet obtained their Professional Engineering status, which is a requirement in all engineering universities. This is very important as CEAB accreditation course credits require that a minimal number of P.Eng. taught units must be achieved in each Engineering undergraduate option. Failure of some faculty to obtain P.Eng. status restricts the undergraduate courses they can teach, while imposing additional course burdens on other faculty. Sessional instructors with P.Eng. status are rare, and more difficult to hire than those without status. While the requirement for P.Eng. status has been in faculty offer letters since at least 2000, and noted in biannual salary reviews since 1990, the department agrees with the ER that SFU implement the practice of putting a specific deadline (typically 2 years) in all engineering faculty position offer letters as is done at other universities. This is being made clear to new faculty candidates during the current interview process. Since 2016 the director has been meeting regularly one on one with the current faculty without P.Eng. status with some notable success in getting several resistant faculty started on the process, but not all have cooperated. Additional tools from the administration would be welcome. Another significant assistance in this would occur if departments offering service courses required to be taken by engineers would agree to promote P.Eng. status for instructors in those courses and add Engineering specific content in those courses, as is often done at several other universities.

• As the ER review noted the budget cuts of previous years have resulted in a decline in the number of technical support staff (failure to replace those retiring or leaving) in Engineering Science. This includes both laboratory staff supporting the course labs, and computer staff which provide both hardware and software support for the laboratories. Compared to 2006 the number of technical staff has declined by 25%, while the computer staff were recently able restore the previous staffing levels. However the number of students supported, as measured by undergraduate student head count, increased by 1.7 times so their load is much higher. By the very nature of engineering training, it requires the majority of the courses to have hands on laboratory experience, which in turn needs considerable support for installing and maintaining the lab equipment. Many labs involve both computer hardware, specialized licensed software and interfaces to external laboratory hardware. The lack of laboratory space means that both equipment and computer software must be constantly reinstalled/rebuilt as the courses offered in the labs change from term to term. The department received approval and budget for a new laboratory engineer this spring which is a good start in this recovery. Currently the department also has two temporary technical staff. Several current technical staff are approaching retirement and will need to be replaced. The department will be requesting at least 2 additional permanent technical staff budget permitting.

Note that where data/numbers in this response is not quoted in the ER report the values are taken from the Engineering Science self-study report (which also gives the citation source) which was available to the ER team.

1.1.2 Graduate:
(a) The ER suggested that funding for graduate students be increased by increasing TAships and reducing number of grad students.
(b) ER is concerned about the duration of masters degrees and suggests higher mentorship.
(c) ER recommends bringing back the PhD comprehensive examinations.
(d) Increase the number of graduate courses.

Graduate Program Response

- The ER has suggested ENSC raise funding for graduate students by cutting back the number students, paying them more from research grants, and increasing the TAships for the remaining students. When considering this it is important to note that in addition to the primary role of graduate students which is training highly qualified personnel to serve industry and academia via their research experience, they also serve the other valuable role of supplying Teaching Assistants (TAs) skilled in the fields the department needs to train the undergraduates. This ER proposal simply will not work as currently Engineering Science does not have enough thesis graduate students to provide sufficient TAs to meet the needs of our engineering courses. Indeed one of our biggest problems in the TA area is that for several upper division specialized courses we often cannot find enough qualified TAs, because there are too few faculty supporting graduate students in those areas, and thus the department needs to take on TAs which require additional training in those specialized areas. Indeed ENSC budget has tripled the TA funds per graduate student since 2010 due to the rise in the undergraduate student population. The reduction in the number of faculty since 2010 combined with increase student numbers in the classes means that there are not nearly enough thesis graduate students to support our program. Most faculty are taking on as many graduate students as their grants allow them to afford, or they can squeeze into the limited research space they have. However several faculty have ramping down their number of graduate students grads as they are planning on retiring in a few years. As a result many TAships are being offered to MEng students (course-only masters which are not normally supported within the department) or students in Mechatronics (another FAS department). Indeed this illustrates the point; under the SFU TSSU contract the department can only offer TA positions to non ENSC graduate students when every ENSC thesis grad has been offered 5 TA units in a given term. Hence to meet our TA needs the department actually needs to increase the number of thesis students, a point that was made to the ER team. One thing that Engineering Science would like to do is verify that faculty are paying the graduate students the support promised in the invitation letters – but we need additional office staff to accomplish this. In another area the department is constantly seeking scholarships from industry to provide additional graduate support as it recognizes the cost of living in Vancouver.

- Both the ER and the Engineering Science graduate program committee has been concerned about the stretching of Masters and PhD degree completion times. The department targets are 2 years for MASc and 5 for PhDs and we know these are not always being met. Furthermore we think the ER was somewhat misled as the maximum allowed terms by Graduate studies are 3 years for MASc and 6 for PhD, not the longer terms they quoted. In the department’s self-study report gathered data shows the average completion time is 3.1 years for MASc and 5.2 years for PhD. One improvement would be increasing the number of graduate courses so students are not delayed by the lack of course availability (see part c). The department plans to start tracking grad student entrance/completion times to address this issue. In the mentorship area, the graduate program committee will further
enforce the requirement of the graduate progress reports by taking that into account when considering approving additional new graduate students for a faculty member.

- Engineering Science covers 6 major diverse engineering areas. Graduate comprehensive exams proved very difficult in the past for students. These were replaced by a presentation to the supervisory committee on the student’s research. However we agree with the ER – this review has often been pushed back until it is too late in the program to identify students not suited for a PhD. The department is exploring alternatives over the next year.

- Limitations on the number of graduate courses are a direct result of the department’s lack of faculty. The CEAB demands for undergraduate courses, which effectively must be taught by P.Eng. holding faculty, combined with the doubling of the student to faculty ratio, means that we have had to reduce graduate course offerings from our preferred level. Engineering Science is implementing as one measure, the creation of a series of specialized Journal Paper Study courses. This was tried in the past but with a single course the diverse nature of the program resulted in many papers being studied that had little to do with a given student’s research area. Instead we plan a set of 6 such courses, offered once a year, specializing in the main research areas of the ENSC: Electronics, computer engineering, systems, biomedical engineering, engineering physics (nano/quantum materials) and telecommunications so students have an offering tuned to the board area of their research.

1.2 Resource implications (if any):

- The ER report recommended that Engineering Science trust the administration and Dean to provide sufficient funds. An implication of carrying the FAM down to the department level would result in the department being unable to fund the CEAB required additional faculty positions. That requires either ENSC getting sufficient funds within the faculty by the FAM not being uniformly applied or FAS being given additional funds which can be used to fund this. Since the alternative of sticking to the FAM risks the loss of CEAB accreditation we follow the ER recommendation of trusting the administration/Dean to find the funds. Gaining new faculty significantly reduces several issues for both the undergraduate and graduate program.

- Improving retention of Engineering Science students is of significant benefit to both SFU and ENSC. Engineering is planning the initial trials of the proposed new retention program in 2018. If these prove successful we would ask the Dean/administration consider funding the program to front load the benefit from the increased FTEs that would result. In the long term (about 4 years) this program should pay for itself with higher FTEs generating increased funding under the FAM.

- The maker space equipped room in the library has been funded by the VPR, thus minimizing the risk to ENSC of creating a course training students in maker technology. The FAS Dean has promised upfront money which will cover the course development and the potential need of a sessional instructor for the first attempt, in anticipation of future FTE generated funds from this course via the FAM, thus reducing the risk the ER was worried about. A fast track approval of the course, and potential WQB status would help in making this successful.

- Engineering Science is one of the few departments at SFU where the need for professional status of faculty is a critical necessity for the school. Furthermore lack of P.Eng. status by a given faculty member restricts the courses we can safely assign to them, thus increasing the teaching load on other faculty, and requiring the department to do challenging searches to find, what are often rare
P.Eng. sessional or expensive visiting instructors. Given the position of both the CEAB and ER of the vital importance of this P.Eng. status for faculty we would request the clear support of this as a significant department criteria in such areas as biannual salary reviews, promotions or chair applications.

1.3 Expected completion date/s:

- The time line required for implementing replacement of the low number of faculty is set by the next CEAB review which is scheduled for Fall 2019. That means replacement position requests will be put in for both 2018 and 2019. Discussions with the CEAB suggest that at least 2 years of faculty growth (3-4 new faculty in addition to those already approved) and approval of a third year of growth would be required to meet the CEAB expectations.
- ENSC is already working with First Nations organizations to create a proposal for a targeted faculty position and is focused on recruitment of quality First Nations students. Several possible industrial chairs are being investigated.
- A new teaching assignments formula will be developed by the 2019 course planning year.
- The Library has been funded for the maker space renovation, with a support letter from ENSC forming part of their application to the VPR’s office. Direct discussions and coordination is underway between the librarian in charge of the maker space and the ENSC director to coordinate the creation of a course that fits with the facilities being created. We expect to submit a course proposal to SCUS by January 2018.
- For improving undergraduate retention the student help desk concept is already budgeted for spring 2018, with a summer 2018 repeat planned. Testing of the 20% broad based admissions is currently under discussion with the Dean with a target of the 2019 fall admissions. Discussion with the faculty have begun on the in course tracking of student performance project. The Big Data project to improve student retention/admissions is a 2019 targeted program.
- The P.Eng. status of faculty has been an ongoing top priority of the director since summer 2016. The department is paying for the initial application costs of faculty as an incentive. This is also become an important point in biannual salary reviews/promotions.
- The new laboratory engineer position will be posted before the end of 2017. We plan on requesting the replacement of the temporary positions with full time ones in the next budget/staff requests.
2. RESEARCH

2.1 Action/s (what is going to be done):

(a) ER notes that the greatest restriction on research is the very limited space available.
(b) The ER calls for increased cooperation with other departments and universities
(c) ER calls for the department to create a long term plan

• The ER notes the very restricted physical space available to the department significantly limits the ability of faculty to do research and accept graduate students. Currently the median space for faculty members is only 50 sq m, which must house both research equipment, graduate students and post docs. This number is lower than either the NASM standard for engineering, or when compared to other SFU science/applied science departments. The ER suggestion was that the faculty reduce the number of graduate students and concentrate on the highest productivity research. However as noted in part 1 reducing the number of grads is not possible given the need to support courses with TAs and would clearly damage the intensity of research within engineering science. To improve the use of space the Faculty of Applied Science has created a new space committee, run through the Dean’s office, which will set space allocations. Engineering science is also developing a formula to allocate space based on faculty performance in teaching and research. Nevertheless, the longer term space solution must be related to the building renewal plan under discussion in section 4.

• The ERs call for increased cooperation with other faculties and universities is welcomed and something the department is promoting. The department is currently looking at appointing adjunct members from other faculty (especially physics and chemistry) to help promote such cooperation. In addition 3 memorandums of understanding (MOUs) have been signed with Japanese universities/institutes in the past few years mostly focused on cooperation between engineering programs. Several exchange visits between ENSC faculty and those universities have taken place in the past year.

• The ERs call for the development of an academic long term plan for the department is very timely. It is notable that prior to 2017 the department had not seen a retreat off campus since the last external review. The retreat this year was quite successful but focused too much on the external review preparation, as did the self-study report. In October the Engineering Science faculty members held a brainstorming session, with an external facilitator to discuss the future directions of research concentration connected to the new faculty searches. We plan on having regular retreats starting next year to focus on developing and maintaining the long term academic plan.

2.2 Resource implications (if any):

• As noted by the ER the low research space is limiting the ability to do research. Section 4 discusses the plans for building renovation to expand that space. However in the meantime the department is carefully reviewing all research space to make certain it is effectively used.
• Setting up MOUs with foreign universities is time consuming, and must be carefully done, but has long term benefits for the department.
• Running a retreat to discuss long term plans costs about $3200 based on the 2017 experience

2.3 Expected completion date/s:

• The building renovation was expected to start in spring 2018 but that date does not seem possible at this point, so it may be pushed back by up to a year
• A 2 year time line for setting up the adjuncts with other faculty at SFU is planned. MOUs are an ongoing action and take about 6 months from start to approval by senate
• Target is to have the new ENSC long term academic plan in place by fall 2018.

3. ADMINISTRATION

3.1 Action/s (what is going to be done):

(a) ER note that with the new Dean and VPA there is the opportunity to rebuild trust between the school and the higher administration
(b) ER recommends increasing the number of departmental support staff
(c) ER notes concerns of some faculty about the makeup of the TPC

• As noted by the ER the continued shrinkage (by nearly one third) of the Engineering Science faculty over the past 10 years in spite of requests for replacement positions, while at the same time the number of students increased by 50%, has resulted in a significant loss of trust by the faculty in the administration. As the ER stated both a new dean and new VPR have taken control at SFU, and this creates the opportunity to change this relationship. The approval of the 4 new faculty positions in early 2017 was a good start on that recovery. The Dean has accepted invitations to attend several ENSC faculty meetings for general discussion, and already has done so in the past month. We suggest the upper administration consider similar requests to help engage the faculty. The department chair will happily work with the Dean and VPA to improve this relationship.
• As noted by the ER the department is significantly understaffed in the administrative area. The current office staff is lower than it was in 2006, but the number of student has increased by 1.7 times. For example this means that to support the undergrads we have one person serving 1100 students in a very complex program. ENSC has received approval for one temporary office staff (Coordinator, Academic Programs) this year and will be requesting turning it into a permanent position in the next budget cycle. Future additional staff to support student/faculty numbers to the needed levels will be a target in budget considerations.
The ER under the weaknesses section quotes a concern that the TPC contains people that are being reviewed in that year. First it is important to note that no TPC that reviews promotions contains either the faculty member, or their spouses, under promotion consideration. However for biannual reviews the smallness of the department, and SFU TPC makeup requirements, end up creating TPCs which do contain members that are under review that year. For example the requirement of minimal number of assistant and associate members on a committee forces this when the department has only 1 assistant professor and 3 associates. When combined with other limitations such as faculty on leave it is impossible to create TPCs which do not have at least one member under biannual review in the voting process. The chair takes care that no discussions of cases that might impact a member or their spouse takes place when they are present.

3.2 Resource implications (if any):

• The department recognizes that the high time demands on the VPAs office and the Dean in requests to rebuild the relationship
• Again the major limitation of gaining the administrative staff we need is the current budget model.

3.3 Expected completion date/s:

• It takes time to rebuild trust. The department will be working with the Dean and VPA office on this over the next 2 years.
• Current plans call for approval of the permanent office staff position this year and additional positions over the next 3 years.

4. WORKING ENVIRONMENT

4.1 Action/s (what is going to be done) ER recommendations:

(a) ER notes insufficient space for both undergraduate teaching, and research/graduate work.
(b) Regenerating the team spirit within the department.

• As the ER noted the Engineering Science space in the Applied Science Building (ASB) is insufficient to provide the required combination of high quality undergraduate education and faculty/graduate needs. Indeed since 2010 ENSC has lost 10% of its office space and another 10% of the research space was sacrificed to gain an 8% increase in dedicated undergraduate lab space. This does not count the frequent use of research space/equipment to support undergraduate labs. Fortunately the Applied Science Building is slated for renovation due to the building envelope problems, which offers an opportunity to increase ENSC space for teaching labs and graduate research. The FAS Dean has created a renovation planning committee that is exploring how to expand resources within the existing building by modification of the repair project. ENSC has been making proposals to that committee for innovative ways to expand the space within the current building. Valuable space could be obtained at a modest increase in the budget over
that of the repairs compared to more expensive alternatives (e.g. a replacement building). Strong support from the administration for SFU advancement to raise funds for this expansion is requested.

• In 1990 Engineering Science faculty were proud to be a program that trained some of the most highly qualified undergraduates in Canada. The reduction in the number of faculty combined with the increased workload from student growth has left the department with a very discouraged faculty. As a recent meeting with faculty relations for our 2017 TPC noted ENSC was the only department that at the time had no assistant professor rank. The director is trying to change this discouragement by being very open about issues such as department budget, CEAB reviews, and space decisions. We have held our first department summer social since 2004 as part of the department team building program. The faculty retreats have shown a significant renewal of interest in the department by faculty members. To help encourage this renewal the director is developing ways to reward those faculty that contribute to the department activities outside of the traditional teaching relief.

4.2 Resource implications (if any):

• The ASB repair project is a necessity already being budgeted as the university has no choice if it is to save this building. As noted some of the renovation can create new space simply by changing the design of the project within nearly the same budget. However to gain significant additional space will require raising funds. Engineering Science faculty is more than willing to work with SFU advancement to help promote this project and help raise funds for it.

• Rebuilding the spirit of Engineering requires as much creativity as the director can muster. However gain in department spirit is not possible if the growth of faculty numbers and other resources does not continue.

4.3 Expected completion date/s:

• Current project estimates suggest the renovation could be completed within a year of starting it – maybe mid 2019.

• It will take several years to regain the department spirit but we are determined to do so.

The above action plan has been considered by the Unit under review and has been discussed and agreed to by the Dean.

Unit Leader (signed)  Date

Glenn Chapman  Nov. 7 2017

Name Glenn Chapman  Title Director School of Engineering Science
Section 2 - Dean’s comments and endorsement of the Action Plan:

The School of Engineering Science (ENSC) has an outstanding history, but it has fallen on harder times. I am committed to working with the School Director, and indeed all of ENSC to remedy the situation. My discussions with the Provost reflect a similar sentiment from his office, and he has indicated a desire to get more personally involved, as needed or desired. The Provost has also just engaged an academic planning process for the entire academic agenda of SFU. I am taking this very seriously, and am creating a Faculty-wide process that will allow for bottom-up, top-down, and iterative planning. This is a terrific opportunity for ENSC to make a strong case for growth in specific areas. I am fully confident that they are up to the challenge. Indeed, while I do not wish to bias this process at its outset, I am confident that ENSC will be able to realize significant growth beyond the current four positions on the books. That said, the School will need to make some difficult choices regarding its future: does it want to expand its academic mission to other areas of discourse, or to reinforce its current core? This is for the planning process to resolve, and I look forward to that conversation.

The above Action Plan makes clear an unusually large set of challenges. Some of these are the product of the “Faculty Allocation Model” (FAM) and its direct propagation in the past few years from the Faculty to the Schools. Clearly, a more nuanced budgeting mechanism is required, but it must be driven by the academic plan, not the other way around. It must be said that some of the difficulties also come from faculty within the School who are not team players. The current Director has admirably re-invigorated a process to achieve greater collaboration and consensus. It is now up to all faculty to rise to the challenge.

ENSC is housed in the “Applied Science Building” (ASB) on the Burnaby Campus. This space is suffering from systemic functional problems and a requirement to address considerable deferred maintenance. We have begun a collaborative process with Facilities and Services and the Provost’s Office to develop an affordable remediation and renovation plan. We will also work with SFU Administration to secure additional space. That said, the current use of space allocated to ENSC is not optimal. As such, we have struck a Space Allocation Committee to work with the School on improving the deployment of research, teaching, and graduate student space that is allocated to ENSC.

ENSC does appear to be somewhat understaffed. My Office will work with ENSC to strengthen its staffing and its organization as part of its academic plan.

ENSC has an excellent foundation of scholars and staff. It has a storied history. I look forward to its considerably increased growth in the coming years, with an attendant rise to prominence.

Faculty Dean

Date
7 November 2017
School of Engineering Science Educational Goals

Report in connection with 2017 External Review

When considering Educational Goals it is important to note that the School of Engineering Science must meet the learning outcomes requirements of Canadian Engineering Accreditation Board (CEAB). Starting in 2012 the CEAB required all engineering schools in Canada to implement a quite complex measurement of educational goals (Learning Objectives) over all its courses and program options and detail their results in the next accreditation report, which was for Engineering Science was in 2015.

The undergraduate program in the School of Engineering Science has been developing and using educational goals since 2012. We have engaged in an iterative, consultative process for several years as part of our accreditation requirements set forth by Engineers Canada. In a model similar to those used by ABET (an accreditation body) in the United States, Engineers Canada has augmented its accreditation requirements such that school must not only account for exposure to content, but also demonstrate that graduands exhibit key competencies by the time they graduate. In the nomenclature of Engineers Canada, these Learning Objectives at the program level are called graduate attributes. The curricula in all engineering schools across Canada must be designed in order to meet the following twelve graduate attributes as outlined in Table 1.

Note that the twelve attributes listed along with their descriptions are non-negotiable; that is, individual engineering schools must adopt and comply to all twelve attributes. However, schools are free to add any additional attributes that are appropriate for their program. Given the resources necessary in implementing and sustaining twelve attributes, the School of Engineering Science has decided not to add any additional attributes at this time.

Each of these indicators are broken into multiply rubrics (sub indicators) that are assigned to specific courses. Table 2 shows the breakdown for just Attribute 1 presenting corresponding rubric descriptors of our performance categories. All 12 indicators are defined at this level of detail. These rubrics were modified from similar attributes in other Canadian engineering programs. The complete description of all attributes and their current measures are given in 2015 CEAB accreditation review document entitled Evaluation of the Engineering Science Program; Volume 2: Exhibits.

It is important to note the substantial load this puts on Engineering Science faculty and staff. Each course must report on several (but not all) attributes for each offering. Each faculty member must select the specific factors and the questions, tests or report mark that represents that measurement, then transfer this into a spreadsheet for their report. Over the whole program every attribute and their indicators must be covered and recorded. One faculty member is part time devoted to gathering, maintaining, and summarizing all this information. A measure of the detail required is that the 2015 CEAB report section mentioned above ran to 279 pages. The next section describes the indicators, and how they are related to the courses. These details were available to the External Review committee in section 6.3 of the self-study report.
Table 1. The Twelve Graduate Attributes with Descriptors.

| Attribute 1: Knowledge Base for Engineering |
| Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program. |

| Attribute 2: Problem Analysis |
| An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions. |

| Attribute 3: Investigation |
| An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions. |

| Attribute 4: Design |
| An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations. |

| Attribute 5: Use of Engineering Tools |
| An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations. |

| Attribute 6: Individual and Team Work |
| An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting. |

| Attribute 7: Communication Skills |
| An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, |
and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.

Attribute 8: Professionalism

An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.

Attribute 9: Impact of Engineering on Society and the Environment

An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.

Attribute 10: Ethics and Equity

An ability to apply professional ethics, accountability, and equity.

Attribute 11: Economics and Project Management

An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of engineering and to understand their limitations.

Attribute 12: Life-long Learning

An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.
Table 2: Attribute 1 (Knowledge Base for Engineering) indicators and rubics

<table>
<thead>
<tr>
<th>ID</th>
<th>Indicator Title</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1.1</td>
<td>Mathematical Knowledge</td>
<td>Describes concepts related to mathematics and solves mathematical problems relevant to engineering.</td>
</tr>
<tr>
<td></td>
<td>Exceeds Expectations</td>
<td>Has exceptional mastery of mathematics relevant to engineering. Processes used are always correct. No mathematical errors. Identifies and corrects own errors. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td>Meets Expectations</td>
<td>Has a systematic mastery of mathematics relevant to engineering. Processes used are always correct. Mathematical errors are minimal or minimally important. Independently corrects errors identified by an instructor. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td>Marginal</td>
<td>Has a marginal level of mastery of mathematics relevant to engineering. Processes used are usually correct. Some mathematical errors. With assistance, corrects errors identified by an instructor. Work layout is legible, with some parts difficult to interpret.</td>
</tr>
<tr>
<td></td>
<td>Below Expectations</td>
<td>Has an insufficient mastery of mathematics relevant to engineering. Processes used are mostly incorrect. Many mathematical errors. Usually cannot correct errors identified by an instructor. Work is illegible.</td>
</tr>
<tr>
<td>1.2</td>
<td>Natural Science Knowledge</td>
<td>Describes concepts related to the physical and life sciences and solves related problems relevant to engineering.</td>
</tr>
<tr>
<td></td>
<td>Exceeds Expectations</td>
<td>Has exceptional mastery of natural science problems relevant to engineering, and solves them with no errors. Identifies and corrects own errors. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td>Meets Expectations</td>
<td>Has a systematic mastery of natural science problems relevant to engineering, and solves them with minor errors. Independently corrects errors identified by an instructor. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td>Marginal</td>
<td>Has a marginal level of mastery of natural science problems relevant to engineering. Solves natural science problems, with some errors. With assistance, corrects errors identified by an instructor. Work layout is legible, with some parts difficult to interpret.</td>
</tr>
<tr>
<td></td>
<td>Below Expectations</td>
<td>Has an insufficient mastery of natural science problems relevant to engineering. Unable to solve most natural science problems. Usually cannot correct errors identified by an instructor. Work is illegible.</td>
</tr>
<tr>
<td>ID</td>
<td>Indicator Title</td>
<td>Description</td>
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<tr>
<td>1.3</td>
<td>Engineering Science Knowledge</td>
<td>Describes and applies fundamental engineering science concepts and knowledge to engineering problems.</td>
</tr>
<tr>
<td></td>
<td><strong>Exceeds Expectations</strong></td>
<td>Confidently and strategically applies fundamental engineering science concepts and knowledge to engineering problems, with no errors. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td><strong>Meets Expectations</strong></td>
<td>Confidently applies fundamental engineering science concepts and knowledge to engineering problems, with minor errors. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td><strong>Marginal</strong></td>
<td>Applies fundamental engineering science concepts and knowledge to engineering problems, with some errors. Work layout is legible, with some parts difficult to interpret.</td>
</tr>
<tr>
<td></td>
<td><strong>Below Expectations</strong></td>
<td>Fails to apply fundamental engineering science concepts and knowledge to engineering problems, or applies knowledge with significant errors. Work is illegible.</td>
</tr>
</tbody>
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<thead>
<tr>
<th>ID</th>
<th>Indicator Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.4</td>
<td>Discipline-Specific Knowledge</td>
<td>Describes and applies fundamental concepts and knowledge related to a specialized engineering discipline/option to engineering problems.</td>
</tr>
<tr>
<td></td>
<td><strong>Exceeds Expectations</strong></td>
<td>Confidently and strategically applies fundamental concepts related to a specialized engineering discipline to engineering problems, with no errors. Work is clear and well organized.</td>
</tr>
<tr>
<td></td>
<td><strong>Meets Expectations</strong></td>
<td>Confidently applies fundamental concepts related to a specialized engineering discipline to engineering problems, with minor errors. Work is clear and well organized.</td>
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<td><strong>Marginal</strong></td>
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</tbody>
</table>

### 1.1.1 Indicators

The prescribed twelve attributes ensure a consistency among all engineering schools, and, although these attributes form a constraint, latitude is given to each program in specifying the indicators that provide data that map to each attribute. Freedom in creating indicators allows each engineering school to differentiate themselves from others. These indicators are distributed throughout the curriculum where data are obtained through various in-course assessments that map back to the program level attributes. As such, learning outcomes at the course level serve as data points for program level indicators that are associated with particular attributes.

Figure 1 contains an illustrative example of the relationships between course-level learning outcomes, program-level indicators, and the mandated attributes. In the figure, notice that an individual course has several course-level learning outcomes that correspond to various program-level indicators. Aggregating all core courses over the curriculum provides full coverage via a many-to-one mapping. That is, each indicator is covered more than once, providing multiple data points. Having multiple data points allows our undergraduate curriculum committee to determine areas of improvement, such as enhancing pre-requisite courses to ensure students are ready for subsequent courses. For example, if an instructor in fourth year observes students are not performing well in groups, then it is possible to review the curriculum to determine where indicators related to groups are taught and assessed. Continual improvement can then be
implemented in a few ways: 1) the course where the instructor observes a problem can review this material within the course; 2) the course(s) occurring earlier in the curriculum may need to enhance the coverage and assessment of this topic; and 3) additional content regarding group work could be added to other courses in the curriculum. Clearly, these options are not mutually exclusive, and, in practice, changes may occur at all three areas.

Because Engineers Canada mandated attributes, the School of Engineering Science was in a position of already having educational goals in place; however, substantial work was necessary in order to ensure that our indicators were appropriate for our program, aligned with all the CEAB attributes, and were placed in our curriculum in the most appropriate courses. Educational literature has demonstrated that, for learning outcomes to work, faculty members must buy in to the process and not see it solely driven from the top. As such, persons in leadership positions in the School of Engineering Science did not simply impose indicators; instead, a working group created preliminary indicators and then surveyed faculty to determine which indicators fit their courses. Based on the survey data, a subset of indicators congruent to each course was assigned. This initial process culminated in data collection and a report submitted as part of our accreditation review to Engineers Canada in 2012. Our progress towards officially implementing attributes was commended by Engineers Canada.

Since this time, we have continued to improve. As we developed our new curriculum (which is now fully implemented), we made changes to course content and sequencing, keeping in mind the mandated attributes. Our common two-year core for all options, has allowed for better coverage of indicators for all students. Additionally, we have reworded, combined, and deleted some indicators based on the collected data and instructor feedback. We also leveraged our mandatory co-op program, and have placed many key indicators that relate to industry experience as part of the co-op course deliverables. Finally, we have provided sample rubrics for each indicator to serve as exemplars for instructors. The complete rational for our changes and a comparison between our first and second iteration of indicators are described in the document submitted for our 2015 CEAB accreditation review document entitled Evaluation of the Engineering Science Program; Volume 2: Exhibits.
Figure 1. Example Mapping Showing the Relationship Between Courses, Indicators, and Attributes.

The indicators associated with each attribute along with their sample rubric are detailed in CEAB Indicators. Note that each indicator is divided into four performance categories: exceeds expectations, meets expectations, marginal, and below expectations. Table 3 provides parallel descriptions to help contextualize these performance categories.
Table 3. Definition of Performance Categories

<table>
<thead>
<tr>
<th>Exceeds Expectations</th>
<th>Meets Expectations</th>
<th>Marginal</th>
<th>Below Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above</td>
<td>Target</td>
<td>Threshold</td>
<td>Below</td>
</tr>
<tr>
<td>Exemplary</td>
<td>Competent</td>
<td>Developing</td>
<td>Not Demonstrated</td>
</tr>
<tr>
<td>Excellent Performance</td>
<td>Good Performance</td>
<td>Satisfactory Performance</td>
<td>Unsatisfactory Performance</td>
</tr>
<tr>
<td>A+, A, A-</td>
<td>B+, B, B-</td>
<td>C+, C</td>
<td>C-, D, F</td>
</tr>
</tbody>
</table>

Instructors are free to determine the percentages that constitute the break points between these performance categories. That is, there is no departmental imposition of a particular percentage that automatically maps to a performance category. This freedom allows instructors to reflect on student performance and account for more challenging assignments and exams. It also reinforces the importance of academic freedom.

1.1.2 Continual Improvement

To ensure that effective improvements are made to our program, the School of Engineering Science has created the Accreditation and Continual Improvement Committee (ACIC), which reports directly to the Undergraduate Curriculum Committee (UCC). ACIC is comprised of faculty members, plus a representative from each of the Teaching and Learning Centre, Faculty of Applied Science Student Advising, and Co-op Education. To ensure that ACIC has up-to-date information regarding the program, the chair of ACIC also serves on the UCC and the Progress Review Committee (PRC).

ACIC seeks to rethink engineering education in the School by envisioning curriculum enhancements in both the short- and long-term and by reporting recommendations directly to the UCC. To accomplish this goal, the ACIC’s activities and plans include assessing program success, consulting with stakeholders, studying best practices in engineering education, and expanding stakeholder representation on the committee.

One of the guiding principles for triggering change within in the program is that all changes must be sustainable. As such, part of the role of ACIC is to determine the level of priority for each indicator and to address them in order of importance. To determine this order, ACIC first looks at indicators based on our four performance categories: exceeds expectations, meets expectations, marginal, and below expectations. When analyzing the data at the course level, we expect that at least fifty-percent of the students will together be in the exceeds and meets expectations categories. We also expect that no more than twenty-five percent of students will be in the below expectations category. Any courses that are outside of these ranges are flagged for review in order to determine the cause or the problem. At this time, ACIC also prioritizes courses that are common to all, or most, options over option-specific courses. Additionally, given that the transition from high-school
to university is challenging for many students, we also prioritize enhancements in the first two years of the program.

For the current round of continual improvement, in addition to student performance, ACIC is prioritizing indicators that need additional coverage in our program. Ideally, each indicator should be assessed in both lower and upper division courses. For many indicators, this type of coverage is the case; however, some of the indicators need additional coverage throughout the program to ensure students have exposure to key concepts and also to give them an opportunity to improve as they progress.

It must be stressed that ACIC does not solely rely on the data provided for each indicator when making decisions. Instead, the committee uses these data to contextualize our faculty members’ experiences. The comments and observations made from members in faculty meetings, the UCC, the PRC, and the experience of our advisors and co-op coordinators all impact how change is triggered.

As previously mentioned, continual improvement has already occurred by revisiting our indicators and making changes based on the data we collected and on instructor feedback. We are confident that our indicators are close to steady state, and we are now focusing our efforts on strengthening our coverage within our program. For a detailed list of changes we have implemented, changes we are currently implementing, and changes we will implement, the interested reader should consult the aforementioned document submitted for our 2015 accreditation review entitled *Evaluation of the Engineering Science Program; Volume 2: Exhibits.*

1.1.3 Closing Remarks on Educational Goals

We are confident that we meet and exceed the requirements set forth by SFU regarding implementing educational goals. The mandate set forth by Engineers Canada provided the initial impetus to implement such a protocol. Although our attributes were mandated, the overall process demanded a collective, coordinated effort by all faculty members to ensure appropriate indicators were developed and assigned to the correct courses. Because we were one of the first faculties to deal with educational goals, the Chair of ACIC has worked with members of the Teaching and Learning Centre and has attended many events sponsored by this unit. It is our hope that our experience can help other departments, and we look forward to helping the larger SFU community.
At its January 10, 2018 meeting, SCUP reviewed and approved the Action Plan for the Department of First Nations Studies that resulted from its External Review.

The Educational Goals Assessment Plan was reviewed and is attached for the information of Senate.

Motion:

That Senate approve the Action Plan for the Department of First Nations Studies that resulted from its External Review.

c: D. Reder
   J. Pulkingham
MEMORANDUM

ATTENTION: Peter Keller, Chair, SCUP
FROM: Wade Parkhouse, Vice-Provost and Associate Vice-President, Academic
RE: Faculty of Arts and Social Sciences: External Review of the Department of First Nation Studies

DATE: December 18, 2017
PAGES: 1/1

Attached are the External Review Report and the Action Plan for the Department of First Nation Studies. The Educational Goals Assessment Plan is included, for information only, with the Action Plan.

Excerpt from the External Review Report:
“Our team found the level of scholarly faculty production to be impressive, the dedication of all members of the department to the mission of the department and the university to be exceptional, and the dedication of all to the community-engagement values held both by the department and university to be exemplary.”

Following the site visit, the Report of the External Review Team* for the Department of First Nation Studies was submitted in May 2017. The Reviewers made a number of recommendations based on the Terms of Reference that were provided to them. Subsequently, a meeting was held with the Dean of the Faculty of Arts and Social Sciences, the Chair of the Department of First Nation Studies and the Director of Academic Planning and Quality Assurance (VPA) to consider the recommendations. An Action Plan was prepared taking into consideration the discussion at the meeting and the External Review Report. The Action Plan has been endorsed by the Department and the Dean.

Motion:

That SCUP approve and recommend to Senate the Action Plan for the Department of First Nation Studies that resulted from its external review.

*External Review Team:
Kathryn Shanley, University of Montana (Chair of Review Team)
Jesse Archibald-Barber, First Nations University of Canada
Alison Gill (internal), Simon Fraser University

Attachments:
2. Department of First Nation Studies Action Plan
3. Department of First Nation Studies Educational Goals Assessment Plan

cc Jane Pulkingham, Dean, Faculty of Arts and Social Sciences
Deanna Reder, Chair, Department of First Nation Studies
Executive Summary:

The story of the growth toward and the eventual creation of the First Nation Studies Department at Simon Fraser University, as outlined in the departmental self-study and elsewhere, impressively speaks to the commitment of many individuals over the past almost thirty years—people who have kept a vision alive of First Nations students’ and communities’ empowerment and need for equitable educational attainment. Building pathways toward equity for Canada’s First Nations people requires such long-term commitment, given the devastating toll colonialism has taken on Canadian Indigenous peoples, and the current educational gaps and social disparities that exist. Wrongs need to be made right if Canada hopes to move toward a future that includes all its citizens equally. Simon Fraser University is to be congratulated on its efforts over those decades, as is Eldon Yellowhorn, who began his career at SFU as a student and became the FNST Department’s first chair. Current FNST faculty and staff carry forward the vision passed on by those who came before them, both their elders and their mentors. That said, First Nations Studies now lags in its forward momentum due to serious understaffing and under-resourcing in efforts to meet the need for growth and development. A re-invigorated vision on the part of SFU’s administration and a dedication of resources toward the department’s growth are sorely needed. I believe you all know that, so what I hope to outline below is a careful assessment of achievements and challenges in the FNST Department, and our recommendations for moving forward.

Developing a leading post-secondary Indigenous educational program requires a great level of support, enthusiasm, and respect toward faculty, staff, and students. Ideally, First Nations Studies departments significantly promote and preserve First Nations traditions and ways of knowing, both in the academy and the community. At the same time, FNST plays a key role in developing new Indigenous leadership as well as non-Indigenous allies and leaders. Informed and culturally aware educators are needed at all levels of the educational pipeline. This work is both specific and expansive, engaging the areas of knowledge of the land and resources, wildlife and environment, health and community wellness, history and philosophies, languages and literatures, performance and oral traditions, arts and media, business and finance, and science and education. Such educational endeavors must follow a movement away from the assimilationist policies of the past, toward decolonization in the present, and Indigenous sovereignty in the future—all policies need to reflect that reconciliation movement, as the TRC 94 Calls to Action detail. Institutions such as Simon Fraser University must look across the board at the efforts toward reconciliation on their campus and must create metrics to assess and track gains being made—over the next three years toward the end of creating “a more accessible, responsive, and productive University environment for Aboriginal community members over the long term” (FNSD Self Study 1).

Supporting a First Nations Studies department is also one of the most effective ways to implement a strong commitment to the Truth and Reconciliation Commission’s Calls to Action. This work must go beyond words to become direct action toward structural change in the university, as all faculty, staff, and students will need to participate actively in realizing these
goals. If Indigenization is to be valued, then these goals must become a central part of the university’s mandate, and this includes supporting a robust First Nations Studies department, in addition to the various Aboriginal support units, offices, and programs.

As an outside review team (with one internal member), we received the charge to evaluate the current strengths of and challenges faced by the First Nations Studies Department and to make recommendations accordingly, first, of things requiring immediate attention and, second, of other challenges FNST faces, and last, of future possibilities for growth. The team members were Dr. Alison Gill (SFU Geography), Dr. Jesse Archibald-Barber (First Nations University of Canada, Regina), and Kathryn Shanley (University of Montana, Missoula, Native American Studies); Dr. Shanley served as author of this report.

By way of establishing the terminology used within and basic ideas undergirding this report, I begin with a description of First Nations Studies, under its many designations: First Nations Studies, Native American Studies, Indigenous Studies, American Indian Studies, Alaska Native Studies, etc. First Nation Studies is a field-based discipline that uses Indigenous knowledges, traditions, histories, and methodologies as a beginning or focal point and does so in ways that reflect the lived experiences of First Nations, Aboriginal, Inuit, "Indian," and Métis peoples. Inasmuch as Indigenous studies (my preferred term) is able to present scholarship from Indigenous perspectives within Western institutions, the principles guiding the educational endeavor involve relationship, respect, responsibility, and reciprocity with Indigenous communities, institutions, individuals, and bodies of knowledge—as those rubrics have been delineated and defined by Shawn Wilson, Linda Tuhiwai Smith, and other Indigenous theorists. In addition to its contributions to global bodies of knowledge, Indigenous studies as a field prepares individuals to work effectively with Indigenous individuals, organizations, governments, industry, and communities.

1. The quality of the unit’s program:

Without a doubt, the FNST Department at SFU excels at achieving its goals and fulfilling its mission, inasmuch as the limited number of faculty and inadequate space and resources allow. Our team found the level of scholarly faculty production to be impressive, the dedication of all members of the department to the mission of the department and the university to be exceptional, and the dedication of all to the community-engagement values held both by the department and the university to be exemplary.

The FNST degree requirements fit well within the field standards of offering disciplinary breadth (history, anthropology/archeology, government [political science], law, literature, art, ethnobotany, environmental studies, gender studies, linguistics). In regard to the structure of the curriculum, FNST shapes itself primarily around a foundation of history, archeology, law, literature (discourse), languages, and culture studies—all put together in a sensible way. One suggestion might be that the curriculum could benefit from creating a core course offering of an introduction to Indigenous art; such a course might include a museum studies component as a comparative ways of seeing.
Educational goals of the unit along with assessment measures were set by the faculty in a retreat in 2016, as stated in their self-study report, and will be fully in place AY 19. They are in the process of linking individual assignments with skill-set and knowledge-base acquisition, after having identified specific courses within which particular learning objectives will be addressed. Students were surveyed as a means of getting a general picture of their sense of achieving the learning objectives, and although the numbers are far from conclusive, the relatively small number surveyed were more impacted by the knowledge received than by the skill sets. The FNST faculty clearly engage the curriculum as a whole educational experience that empowers students to analyze critically, write well, think ethically, and theorize effectively. The department might consider requiring an exit interview for their majors to deepen their assessment efforts.

Reading over the information about the department’s facilitation of joint majors, certificates, cooperative learning, and First Nations Community Academic Outreach Education (FNEP)—not to mention maintaining cross-listed courses and working with graduate students—one finds it difficult to imagine how the unit gets all of that done. Indeed, while the faculty and staff members are consummate in the delivery and administration of the department’s programs, there are some clear signs of strain on its capacity.

According to some students with whom we met, enrollment issues plague the department in that students may have to wait over a year to get into courses they need or want to take. Faculty loads can be helped somewhat by fewer course preparations per year, if they were able to offer more sections on in-demand courses.

With the review of the FNST Department and other university-wide initiatives, Simon Fraser University is poised to take the critical steps needed to become a leader in Indigenous postsecondary education both regionally and across Canada. As noted in the FASS 5-year Academic Plan (2013-2018), the growth of bachelor-level degree-granting colleges in the region poses challenges in terms of competing for students, not to mention many other current and future financial challenges; nonetheless, the FNST Department at SFU has a longstanding and solid history in First Nations Studies that sets it apart. That said, building and maintaining the right brand should be in keeping with the strategic growth areas identified by the FNST faculty, and, inasmuch as is possible to provide adequate breadth of knowledge/skills, the department should remain vigilant in avoiding the temptation to “be all things to all people.”

Indigenous peoples’ visions and needs—along with wrongs to be made right—should remain a high priority, as they are now. FNST faculty and staff are to be applauded for their steady eye to shaping development around those values, remaining true to a mandate of Indigenous empowerment through education. The department’s self-study report captures the FNST philosophical underpinnings well when it says: “A better understanding about this [Indigenous] segment of Canadian society depends on the university and the broader community receiving the latest data and the most accurate interpretation. We activate this ambition by concentrating on areas where we have substantial expertise and the skill sets to produce new knowledge. A major feature of
First Nations Studies is the blending of the academic program with the community-oriented research strategies alluded to in the phrase ‘engaging the world.’”

2. The Quality of faculty research:

The First Nations Department faculty impressively, yet unassumingly, seek to fulfill Simon Fraser University’s bifocal strategic vision “to be a world leader in knowledge mobilization, building on a strong foundation of fundamental research” and “to be Canada’s most community-engaged university.” During our visit, students spoke enthusiastically about the quality of the academic atmosphere and respectfully of faculty research accomplishments, and it is evident each member of the faculty engages with communities in Indigenous-informed ways and with valuable educational products and productions.

The valuable work Dr. Marianne Ignace does with Native language retention, revitalization, and dissemination stands as a model for envisioning a range of activities to address pressing concerns about endangered language. Nothing could be more essential to the survival of the deepest Indigenous knowledges. Her use of traditional stories to teach math shows the brilliance and depth of her commitment to give back to communities what they have lost, in a form and method that moves them forward with inspiration, increased self-esteem, and Indigenous understandings. The grants Dr. Ignace has secured to do her work is truly impressive, especially for her seven-year study to guide endangered language work into the twenty-first century.

The two faculty with anthropological / archeology training, Dr. Eldon Yellowhorn and Dr. Rudy Reimer, contribute to local and global knowledge in contrastive, yet equally valuable ways. Dr. Yellowhorn assists Indigenous communities with their recording of histories of place, and utilizes his photography skills to work in multi-media in documenting information important to the communities. Dr. Reimer, the newest member of the faculty, also works within his home community and has collaborated with television productions to disseminate Indigenous knowledge. I link these two faculty members, because they form a cluster of two lines who complement one another in powerful ways, even though they are in the same unit. Such clusters provide a profile of expertise—a character profile—for an institution or department. Such affinities carry extraordinary potential for showing an Indigenous intellectual “personality” grouping and might be compared to such movements as the Harlem Renaissance, post-modernist scholar/critics at institutions such as Berkeley, Yale, and Columbia (Stanley Fish, et al), the market economists at University of Chicago (Milton Friedman, et al), etc., or the French post-structuralist feminists at Columbia University and the Sorbonne (Julia Kristeva, et al). I can imagine the grandiosity of such analogous pairings might bring smiles to the faces of a few, but let me add that no such movement has occurred yet in Indigenous Studies higher education, except for a short-lived gathering at the University of Arizona in the 1980s (Deloria, Momaday, Silko, et al). Do not hesitate to think big.

The department is fortunate to have among their number a practicing artist, Dr. annie ross, who frequently involves others in process, production, and artifact; for example, her partnership with Squamish weavers that resulted in the weavings displayed on campus in
the Saywell Atrium. She also conducts interviews as a way of recording Indigenous community voices. One student went out of her way to praise Dr. Ross as someone who “cares for those around her” and to declare that she “makes a life-changing difference to a student like myself, who is grappling with ideas in wishing to become a better witness to the lives of others.”

We did not have access to quality student evaluations to make similar observations of other faculty members’ influence and impact as pedagogues, mentors, and role models, but we did receive similar feedback on Dr. Yellowhorn’s valuable contribution to student growth and development.

Dr. Deanna Reder has been involved in recovering “lost” or overlooked literatures. Through an impressive SSHRC research grant, Dr. Reder is involved in a project to digitize Canadian Native literatures in many platforms. Her reputation as an important figure in Indigenous literary criticism and theory grows each year. Her research has been thoroughly woven into the core courses and the cross-listed courses in such a way that her work provides a model for seeing both abstract and applied knowledge at work.

Obviously, so much more could be said about the excellence of the FNST faculty and their accomplishment and continuing research agendas. I will simply say that their work taken as a whole impressively covers a field with multi- and cross-disciplinary approaches to scholarship, pedagogy, and community-engagement. Kudos to them all. I will happily and proudly serve in such a unit and with such exceptional colleagues.

3. **Unit members participation in the administration of the Unit:**

Eldon Yellowhorn performs his service as chair with dedication and focus. The kind of collaborations FNST faculty are called upon to engage in on campus and in community requires administrative duties, formal and informal. As is noted throughout the self-study report, FNST faculty are stretched to the limit in terms of the services they provide to the university community, including all work within the unit to assure its efficient functioning.

It must be noted that during our visit, some FNST people spoke to us about others within the university as regarding FNST to be substandard. Such thinking seems to follow along the lines of an old argument about how inclusion of non-Western ways of knowing represents a lowering of standards. I would have been surprised if I had not heard that, since such backward thinking still exists in all universities, unfortunately. Although we found the remarks difficult to assess and place in context, they ought to be shared so that awareness about the possibilities of such treatment is increased. The combination of being undervalued and overworked presents serious challenges, and gender pressures on women faculty may further intensify the strain. We observed some of that as well. Moreover, as the TRC calls to action become increasingly realized, the push-back may also increase, “Why are we doing this? Why can First Nations peoples put this behind them,” etc.
4. **The Unit's workplace environment is conducive to the attainment of their objectives:**

Although our opportunities to observe the workplace environment as it functions on a day-to-day basis were limited, we can say with confidence that from all indications the administrative support staff in the First Nations Studies Department perform their duties and responsibilities well and devote themselves avidly to the goals of the department. At the same time, they seek to meet the needs of students and respond to communities outside the university. The department administrator perhaps gets spread too thin at times, such that as the department grows additional staff to assist with student advising will be needed.

The physical space, however, is woefully inadequate. All of the FNST courses meet in one particular room, and the department lacks a gathering space other than the atrium, which is shared with the entire university, causing noise and distraction not conducive to a comfortable and focused learning experience.

5. **Future Plans of the Unit are appropriate and manageable:**

The First Nations Studies Department looks to how, on the one hand, they can increase their undergraduate program to include a First Nations Studies requirement for all SFU students, and on the other hand to grow a graduate degree program with an established curriculum. Both require an increase in faculty.

6. **Issues of Specific Interest:**

6.1 **Capability to serve the academic needs of graduate students (supervision and courses)**

The FNST faculty currently serves graduate students through an interdisciplinary independent studies Master's (SAR) option, and those students who avail themselves of that degree path appear to find the curricular, research, and writing experience of their study to be of high quality. Students and faculty, however, express the desire for the department to grow a graduate-level FNST curriculum that is more in keeping with Indigenous Studies methodologies and theories than is the current Western-focused curriculum. The key reason for their hope for a FNST graduate degree has to do with the curricular offerings that fit within the First Nations Studies (First Nations, Métis, and Inuit) perspective. Graduate students told the review committee that, in particular, Indigenous communities need specialists in health, justice, sociology, and political economy. One of the students who found the discussion session with our committee too short wrote to us to make certain her ideas would be more fully expressed. In her letter she emphasizes how her work directly ties to the TRC and how several department faculty provide the expertise and support crucially necessary for her to do her work; their professional and personal commitment to the mandates of the
TRC empowers her. She states, "This department, while small, is outstanding, and I am lucky to be one of many non-Indigenous students who has been embraced, cared for, and inspired by those in FNST."

6.2 **Assess the department’s current complement of undergraduate courses and identify strategies that would fill any gaps.**

In general, the FNST Department’s courses add valuable intellectual and skill-set knowledge to the university offerings for all students in the contemporary world, given the TRC directives, and also fit within a wide variety of majors, e.g., history, archeology, English and world literary studies, education, law, communications, and health and social sciences study. In that way, FNST greatly enhances the general education offers of SFU.

Obviously, a major in FNST provides the above-mentioned breadth and also prepares students to pursue graduate or professional degrees. The more Indigenous Studies focus the courses contain, the more likely they will bring with them a new set of questions built around Indigenous cultural perspectives, ontologies, epistemologies, and pedagogies.

Students also expressed a desire for more tutorial level classes as opposed to large classes; they spoke of a desire for more “conversive” engagement with their instructors and peers, because the material often requires emotional processing as well as intellectual. Moreover, students complain that they often have to wait over a year to take a class they need, because there are too few professors to offer classes in a consistent rotation; one stated that she did not take the minor, because she could not get into the classes she needed in a timely fashion.

On the 100-level, lateral expansion of the “Introduction to First Nations Studies” might include specific topics in First Nations, Métis, and Inuit cultural and historical studies. Coursework that stresses traditional First Nations governance, religious practice, education, economics, social order, art, and politics looks quite different from similar subjects taught through Western paradigms where Aboriginal knowledge often plays out through “deficiency models” perspectives. However, this is precisely why a fully supported and developed first-year course program is essential to the contemporary university community. Other possible areas of curricular growth might include comparative global Indigenous perspectives; community-based participatory research methodologies (if this isn’t covered in other methodologies courses); First Nations media; and Indigenous science.

Throughout our visit, the topic of FNST’s potential offering of a required course for SFU students in their general education roster surfaced as both a way to increase the university’s mission regarding the TRC report and to expose FNST as a field to potential majors. Courses in First Nations Studies do indeed have the potential to re-orient students regarding their received knowledge about Canada’s
history and to re-examine many people’s underlying assumptions about the lives of Indigenous peoples, past and present. A two course sequence could be shaped to offer general education requirement choices and important curricula for FNST majors: the first devoted to the study of the residential schools experience, and a second focused on the Truth and Reconciliation history itself. Such courses would increase the “Sharing of information and best practices on teaching curriculum related to residential schools and Aboriginal history” (Call To Action 63ii) and “Building student capacity for intercultural understanding, empathy, and mutual respect” (63iii).

6.3 Suggest a strategy for the Department to build a long-term, sustainable, community-engaged research and teaching program, that answers calls to action of the federal Truth and Reconciliation Commission.

Offering a graduate degree program creates the most effective opportunities for building a strong Indigenous educational pipeline, because graduate students taught and mentored by FNST faculty in turn become teachers and mentors for undergraduates. Research exponentially increases and thereby enriches both the knowledge base of experts and aspiring experts in the field of First Nations Studies and the potential for community outreach (co-activism) so needed to strengthen Indigenous community infrastructures and leadership. Research and teaching engagement with communities can more easily be shaped and developed from the grassroots levels, but community-based, participatory research takes more time, not to mention the expectation of long-term involvement of the researchers in the community.

Many of the current FNST faculty are active in community-engaged pedagogy and research, and they give every indication that they will continue those commitments into the future. With the critical need for more community language programs, and the growth in popularity of new media and educational productions, increasing the capacity of faculty and enrolling more graduate students would greatly enhance the FNST department’s and SFU’s ongoing work toward answering the TRC’s Calls to Action.

6.4 Opportunities and challenges faced by the Department in the light of institutional indigenization initiatives, identify the most important and appropriate areas for Department involvement.

Faculty overload, perhaps for any First Nations Studies Department, is the number one problem the FNST Department faculty struggle with, and it involves the number and variety of service demands placed on the faculty. FNST faculty must respond to requests for collaboration, consultation, and contribution from other units on campus, within the community, and from the students. These requests, which Indigenous professors willingly engage in as an essential part of their research and service, nonetheless place a level of demand beyond most other faculty duties and service. Further FNST involvement in Indigenization
initiatives, which is essential to the success of those initiatives, will require support from SFU to help build the department’s capacity.

With increased support, FNST faculty can assist SFU in becoming a leading institution for Indigenization initiatives. To this point, the TRC’s Call to Action item 11 “call[s] upon the federal government to provide adequate funding to end the backlog of First Nations students seeking a post-secondary education.” FNST could play a more central role in realizing this item, as collaborators for assessing the educational pipeline issues related to admissions, recruitment, retention, funding, and financial literacy of the First Nations student population.

6.5 **Recommend strategies for ensuring the quality and indigenous perspectives of all courses, including cross-listed courses.**

Although I respect the spirit of this request for strategies to diversify curricular knowledge, a thorough answer seems somewhat impossible, given our limited time on campus and our rather focused attention on the FNST unit itself. I would say, nonetheless, that many ideas come to mind that might be useful to consider. Quite frankly, I find the “indigenizing the academy” concept daunting, though exciting, to envision. The prospect of summer institutes for SFU faculty, focused on a range of themes would be a place to begin. Begin also with the department’s closest allies and branch out strategically to the most essential units requiring (and who are receptive to) diversifying their curricula. Outside funding can be sought to provide the seed money necessary to begin.

Ultimately, new faculty orientations, workshops with the Administrative cabinet, and other specially designed gatherings could be used to increase cross-cultural understanding and raise the conscious awareness of Indigenous history, cultural knowledge and differences, and Indigenous contemporary (particularly educational) issues. Presenters could be from the FNST Department or especially identified speakers.

Seek increased cross-listing with the Art, Gender Studies, English, and Environmental Studies programs.

Providing opportunities and rewards for team-teaching that enables FNST faculty to work directly with colleagues from other units to infuse knowledge could be strategically developed to target the most important fields first—law, political science, economics, etc.—and expanded as resources allow. A robust, well-planned-out, ongoing speaker series that would give professors time to build assignments into their courses that relate to the speaker’s expertise could be powerfully effective, and faculty seminars could be part of the distinguished speaker’s itinerary. Frequent performances by Indigenous artists and visits by community elders would enhance the sense of presence of Indigenous people as a way of enriching campus life at the same time as it would make First Nations students feel more at home.
Getting the entire campus onboard with curricular transformation might require more basic academic efforts. If Canada is like the U.S. in its ambivalence toward anything that seems "affirmative action" oriented, efforts to make inclusion strategies sensible would be in order. For example, Dartmouth University Professor of Medieval Studies, Michelle R. Warren, ended a presentation at the Medieval Academy of America conference, entitled "Diversity in Every Course, Cross-cultural Encounters in Every Classroom," with the idea that "Inclusion strategies are integral to scholarly excellence."

(http://dx.doi.org/10.17613/M6VTJ)

Along similar lines, I often say in the workshops that I do that our "Indian Education for All" mandate from the Montana 1972 Constitution to teach every student about American Indian history and culture is simply critical thinking at its best. A philosophical determination to see TRC excellence in pedagogy and research might require a raising of the discourse level at every meeting. At the risk of seeming pedantic, may I offer that Warren directs people to two important texts: Therese Huston, *Teaching What You Don’t Know*, and Patricia Giren, Biren (Ratnesh) A. Nagda, and Ximena Zúñiga, *Dialogue Across Difference: Practice, Theory, and Research*. Such basic texts can reinforce the idea to faculty across the campus that inclusion is essential and doable with support and effort. I’m not sure if faculty members at SFU need to begin at such beginnings before tackling Indigenous subject inclusion, but I would venture to say that my colleagues at the University of Montana in many areas certainly do need basic conversations.

6.6 Consider what strategy and/or resources would be required to meet the demand for faculty service as the face of Indigenous engagement and representation.

For better or for worse, the Chair of the FNST Department becomes a key go-to person for any variety of requests, questions, collaborations, and contacts. In a small department the service involved in such public service can add up to a serious drain in research time and energy. That pattern cannot easily be turned around, but I would suggest a number of actions: 1) that SFU develop a “point-person system” within each college. That person’s role would be dissemination of information to the larger community and; 2) that a comprehensive analysis be done (and updates maintained by designated staff) of all SFU informational materials, especially websites, to assure that the public and the campus community have a broad understanding of Indigenous program information, key personnel, and other system overview information. The face of the university needs to reflect respect for and understanding of their own campus’s Indigenous presence and systematic inclusion. While all of this may go without saying, I offer the suggestions for validation of current practices, if nothing else.

Recommendations:
Over the next five to six years, increase faculty lines to ten full-time equivalents, with an immediate hiring of two people in tenure-track lines, both of whom would be fully located within FNST. We recommend the hiring of two faculty at the same time as a means both of taking an immediate service burden off the current faculty and of providing a peer-level support structure. The next two hires would be what are known as “cluster hires,” appointments shared with other departments, depending on the curricular and research strategies determined by FNST, and strategically designed to link within the university around key areas.

Rationale:

1) In order for FNST to function more fully as a department, the unit needs a minimum of five new faculty lines—three of whom should have their locus of tenure solely within the unit: First, so they can internally fulfill the department’s administrative duties and responsibilities, including comprising FNST faculty tenure/promotion review committees and filling in curricula and other responsibilities behind colleagues’ research leaves and sabbaticals. Second, a more adequate complement can together shape the field/discipline focus of FNST more fully within the matrix of contemporary Indigenous theory and methodology. Although what they accomplish now as a collective truly impresses us, they actually need more time to build community among themselves. The department’s deeply committed allies and supporters fill administrative gaps, and the new hires should in no way alter their valuable place and roles within the unit. As it currently stands, however, FNST functions as somewhat of a second-class citizen in the university due to its being so critically under-capacity.

2) The increased number of faculty relieve the excessive service load required of FNST faculty. There are too few faculty to do too much, and at that they fall short of functioning as departments ought to function, or as the self-study states, “simply running to stand still.” The service load faculty experience can lead to a burn-out that threatens the career accomplishments of individuals, the functioning of the unit, and the overarching mission of the department in its intersection with the institution at large.

3) In order to contribute adequately and effectively to the institutional mission of addressing the Truth and Reconciliation calls to action. A cluster of two hires with joint appointments could potentially provide research and pedagogical foci to the campus integration of the calls to action.

4) To move away from overuse of sessionals, who are currently delivering one-third of the teaching is a missed opportunity on many levels.

5) To avail themselves of important research, teaching, and community-engagement opportunities to bring real value to students, the University and wider communities.

Provide FNST with increased suitable space for instruction and gathering.

Rationale:
The department needs to have a space that facilitates community-building; enhances public presence in terms of speakers, performer, and Indigenous elders and leaders; and provides undistracted classroom instruction and departmental conference space.

**Develop a graduate degree program.**

**Rationale:**

1) Some faculty note a lack of graduate students to offer assistance on research projects, and that the corresponding inability to offer graduate training can also have a negative impact on the ability to qualify for certain funding streams (though cross-departmental and interdisciplinary work can mitigate this).

2) As discussed above, a graduate studies degree program provides a vital link in the pipeline that can potentially increase student retention, research acquisition, pedagogical opportunities, community-engagement, and enriched curricula.

**Assist FNST in studying the feasibility of a FNST general education requirement for the university.**

**Rationale:**

The numbers question in a university the size of SFU would have to be answered, if FNST were to structure a general education course for all students; many entities would have to be involved in the planning, and the administration would have to assist in the effort. The last thing you would want to do is doom the FNST Department with an all-consuming service obligation.

**Create postdoc positions, perhaps through the Aboriginal Initiative Fund.**

**Rationale:**

New Ph.Ds uniquely fill the role of mentors and infuse cutting edge material and theories into ongoing discussions among faculty who have settled more into their respective foci.

**Conclusion:**

Rather than reiterate what has been recommended above, I would like to add, speaking as someone who is actively involved in her university’s prioritization process (modeled after the frameworks set out by Robert Dickeson), that expanding FNST as recommended comes at a cost to others, I’m sure. I believe the changes outlined are called for within Simon Fraser University’s mission, and that rather than “additive” or part of a “wish list,” expanding FNST represents a powerful and exciting structural transformations in the future of the institution as a whole. In order to offer stronger recommendations regarding implementation, however, we would need to see the larger Indigenous matrix into which FNST fits—a task for the department itself and others at SFU.
I speak for the team when I say we were grateful for the opportunity to explore possibilities with you all, to offer what we have, and to join our optimism and hope with yours that FNST will continue on in excellence and begin to blossom and thrive. Pinamiya, thank you, for inviting us among you.

Works Cited


# EXTERNAL REVIEW – ACTION PLAN

## Section 1 – To be completed by the Responsible Unit Person e.g. Chair or Director

<table>
<thead>
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<th>Unit under review</th>
<th>Date of Review Site visit</th>
<th>Responsible Unit person,</th>
<th>Faculty Dean</th>
</tr>
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<tr>
<td>First Nations Studies</td>
<td>March 22-23, 2017</td>
<td>Eldon Yellowhorn, Chair</td>
<td>Jane Pulkingham, Dean of FASS</td>
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**Note:** It is not expected that every recommendation made by the Review Team be covered by this Action Plan. The major thrusts of the Report should be identified and some consolidation of the recommendations may be possible while other recommendations of lesser importance may be excluded. Should an additional response from be warranted it should be attached as a separate document.

## 1. PROGRAMMING

- **Action/s (description what is going to be done):**

  1.1.1 Undergraduate:
  - Given that First Nations Studies exists only as an undergraduate programme the review committee lauded the faculty for their efforts and encouraged us to continue doing what we have done well. They also recommended that as we grow the programme we should take special notice of the reconciliation movement and the Truth and Reconciliation Commission’s Calls to Action in our curriculum. We will do so by identifying and acting on those Calls to Action that we can effectively engage.
  - The review committee acknowledged the University’s commitment to indigenization and that First Nations Studies could play a leadership role but that the department should avoid the temptation to “be all things to all people.” We will be vigilant about this but remain accessible for consultations; we acknowledge that service teaching in First Nations Studies calls for collaboration between our department and those departments wherein we have, or will have, joint majors or confer credits for certificates. We will explore the feasibility of new courses that can advance this project. For example, we could recommend creating one general course for all students that would be different than the one for our majors.
  - The review committee recognized that our educational goals engage the curriculum as a whole educational experience, and that we should implement an exit interview for majors to enhance our assessment efforts. We will do so in consultation with the TLC.

1.1.2 Graduate:
  - The review committee recommended that we develop a graduate degree programme that will augment our ability to produce the next generation of academics. Our faculty feel strongly that we can be leaders in training young scholars to conduct original research so they can contribute to advancing the discipline of First Nations Studies. We are enthusiastic about the potential such development holds and will seek to launch a graduate programme in the 2020/2021 academic year.
The review committee recommended that we create post-doc positions to complement the research programme of the faculty. We will do so when resources permit. We encourage faculty to consider post-doc positions in their grant applications to assist in their research programmes and to give young scholars experience in conducting original research.

- Resource implications (if any):

The undergraduate programme in First Nations Studies relies too heavily on temporary instructors and the antidote will require continuing faculty. The review committee urged us to hire immediately two tenure-stream faculty appointed full time to the department and, over the next five to six years, increase faculty lines to ten full-time equivalents. We agree wholeheartedly and will seek to do so when resources permit as a way to move forward with developing the Department. Our current top priority is in Aboriginal people and public policy; this will provide some of the necessary resources to alleviate the personnel shortage. Our next choice is a focus on Aboriginal people in the history of western Canada.

- The proposed faculty additions would obviously require resources, e.g. office space.
- If we expand the curriculum and the number of courses offered each semester we will require resources to implement the programme. Herein we consider instructional space as key as we have only one classroom dedicated to our department.
- We cannot estimate resource implications for our potential graduate programme until we develop a detailed proposal. The availability of resources will inform our choices in this process.
- First Nations Studies would be a resource for the Faculty as the goal of indigenizing the curriculum proceeds.

1.3 Expected completion date/s:

Undergraduate
- Dedicating teaching resources to our programme will entail two faculty appointed full time to FNS in the 2018/19 academic year. Thereafter, two additional faculty will be added in the 2019/2020 academic year and one more faculty in the 2020/2021 and 2021/2022 academic years to bring us to a total of ten FTE.
- First Nations Studies is keenly aware that the TRC’s Calls to Action be included in our programme and invoking them is an ongoing project.
- Indigenizing the curriculum is a key aspect of the courses we currently teach and will be embedded in all future courses.
- Educational goals for First Nations Studies and programme assessment procedures will be fully implemented in the 2019/2020 academic year.

Graduate
- Our Department previously explored the likelihood of establishing a graduate programme, but taking into account faculty on leave and new hires, launching it in 2020/21 academic year will allow us the opportunity to design the curriculum and ensure
### 2. RESEARCH

#### 2.1 Action/s (what is going to be done):
- The review committee recommended that we create a position so post-doctoral researchers can work in our department.

#### 2.2 Resource implications (if any):
- We will encourage faculty to include a post-doctoral fellowship position in their application for research grants.

#### 2.3 Expected completion date/s:
- This is an on-going issue that will be contingent on faculty members including such positions when applying for research grants.

### 3. ADMINISTRATION

#### 3.1 Action/s (what is going to be done):
- The review committee noted that we are unable to fill all departmental committees with our current faculty contingent. We will continue to recruit members from the broader campus community until we have the personnel in our department to fill all our committees.
- The review committee noted the excessive service load required of our faculty and cautioned against potential burn out. New faculty to relieve the service demands.

#### 3.2 Resource implications (if any):
- New faculty hires.
### 3.3 Expected completion date/s:
- We acknowledge this to be an issue in our department but this will be alleviated once we have new faculty hires.

### 4. WORKING ENVIRONMENT

#### 4.1 Action/s (what is going to be done):
- As the reviewers noted, “while the faculty and staff members are consummate in the delivery and administration of the department’s programs, there are some clear signs of strain on its capacity.” Specifically, they point to enrollment issues with in-demand courses, such as the ethnobotany course (FNST332), that are difficult to enroll in because of the limited class size. Their recommendation is to offer more sections for these in-demand courses.
- The reviewers expressed concern that the department is stretched to the limit due to the services they provide to the university and broader community.

#### 4.2 Resource implications (if any):
- Growing the programme with new faculty hires will contribute to easing these factors, but they will mean dedicating office space to our department for new faculty and administrative support staff. We are cognizant that space continues to be a contentious issue.

#### 4.3 Expected completion date/s:
- We accept that hiring two new faculty in 2018/19 will help to alleviate these limitation.

### 5. ............................... (OTHER)

#### 5.1 Action/s:
- ........................
- ........................
- ........................

#### 5.2 Resource implications (if any):
5.3  **Expected completion date/s:**

<table>
<thead>
<tr>
<th>Unit Leader (signed)</th>
<th>Date</th>
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<tbody>
<tr>
<td>Eldon Yellowhorn</td>
<td>July 20, 2017</td>
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The above action plan has been considered by the Unit under review and has been discussed and agreed to by the Dean.

Name: Eldon Yellowhorn  
Title: Chair, Department of First Nations Studies.
I met with Dr. Eldon Yellowhorn, Chair of the Department of First Nations Studies July 24 2017 with Glynn Nicholls (Office of the VPA) to discuss the external review prepared by Professor K. W. Shanley (University of Montana) and Associate Professor Jesse Archibald Barber (First Nations University of Canada).

Our office has given close consideration to the external review and to the detailed response from the Department of First Nations Studies. The external reviewers have produced a very thoughtful assessment, capturing the strengths found in the Department, identifying opportunities for new initiatives building on the department's strengths, as well as some challenges.

As the attached Action Plan outlines, the Department plans to pursue several important recommendations. At the undergraduate level, these range from increasing course section offerings for specific high demand courses, to more general plans to build (grow) the undergraduate program with curricular changes reflecting key Calls to Action flowing from the report of the Truth and Reconciliation Commission, while being careful about how the unit provides leadership and service teaching in the context of the University’s commitment to indigenization. The department does not currently have a graduate program, but following up on a key recommendation, plans to launch a graduate program in three years-time in order to assist in efforts to build the next generation of indigenous academics.

The external reviewers identify significant working environment issues, evident in all areas of activity, but especially in relation to teaching, service and administration. At core the challenge is three-fold: very small faculty complement (3.5 FTE) combined with disproportionate demand on faculty time to serve on institution-wide committees or engage in institutional initiatives, and time-intensive community/collaborative research practices. The unit is requesting significant faculty renewal (six continuing faculty appointments) over the next five-year period in order to be able to undertake the needed programmatic changes (in particular graduate programming), as well as to be able to reduce the strain and burnout by increasing capacity at the unit level to undertake departmental and institution-wide administration and service. The office of the Dean will endeavour to support future faculty hiring in the unit as identified above, while balancing renewal needs in FASS as a whole over the next three to five-year period. Interim progress on the latter front is underway with the approval of three term appointments (assistant professor and teaching) over the next few years.

Faculty Dean

Date

October 11 2017
1. Introduction
The Department of First Nations Studies has identified six general Program Educational Goals at
the undergraduate level; these goals are outlined in Section 2.1. Our primary aim is to ensure that
students graduating with a Bachelor of Arts degree in First Nations Studies from Simon Fraser
University have a strong foundation in the knowledge of the discipline, along with essential skills in
research, analysis, and communication that will enable them to flourish after graduation.

The following sections outline our program goals and an action plan for enacting these goals. A key
component of this action plan will be a comprehensive inventory of our core undergraduate courses,
which will serve not only to ensure that our global program goals are being met, but also to facilitate
the formulation of course-level educational goals by 2021, which is Year Four in this Seven Year
process.

2. Educational Goals
The following goals were formulated as part of the Department of First Nations Studies self-study
document prepared for the departmental external review in 2016/17.

Undergraduate students, upon graduation with a B.A. with a Major in First Nations Studies will be
able to:
1. discuss, in detail, the histories and cultures of Indigenous peoples of North America, from
   their own perspectives;
2. identify, analyze and assess contemporary critical issues facing Indigenous people, and critique
   assumptions about Indigenous people in texts and media;
3. use modern library/archival research and retrieval methods to access information about
   specific topics related to First Nations;
4. effectively communicate research and knowledge, orally, in writing and through various forms
   of arts and media;
5. understand and conduct the ethical processes and communication of research, including
   Indigenous ethics and protocols;
6. articulate the impacts of institutions behind colonization, including residential schools, the
   reserve system, the Indian Act and the legacy of legal and political decisions regarding
   Indigenous peoples.

The Faculty of First Nations Studies defined this statement of educational goals during a retreat in
December 2016. Subsequently, we mapped these goals in our current course offerings. Table A
offers a partial impression of the ways these educational goals are directly promoted through the
curriculum.
### 2. Critical Issues

| b. Resource sharing | 212, 222, 301, 353W, 401 |
| d. Environment | 101, 212, 222, 30, 324, 363, 376, 383, 433, 462, 353W, 401 |

### 3. Research Techniques

| b. Data storage | 301 |
| c. Studio methods | 324, 363, 376, 383 |
| d. Video recording | 301, 433, 462 |
| e. Journals | 212, 222, 324, 363, 376, 383, 433, 462, 447 |

### 4. Communication

| b. Literary studies | 101, 301, 110W, 201W, 402W, 329, 360, 324, 363, 433, 462 |
| c. Graphic arts | 101, 212, 360, 402W |
| d. Videography | 212, 301, 433, 462 |

### 5. Ethics


### 6. Law, Policy, Colonial Institutions

| a. TRC & residential schools | 101, 301, 110W, 201W, 402W, 327, 433, 462 |
| b. Indian Act | 101, 201W, 212, 222, 301, 401, 324, 433, 462 |
| c. Constitution Act | 101, 201W, 222, 301, 401, 433, 462 |

### 3. Action Plan and Timeline

As part of the external review process, the Department of First Nations Studies has identified program-level Educational Goals (Learning Outcomes) and an assessment plan. This report reflects the initial stages of a multi-step process that will take several years and involve input from all faculty in the Department of First Nations Studies.

Following the approval of Educational Goals, we are required to map our educational goals to individual courses and to design an assessment plan, refine our current assessment tools, and collect data (student work and surveys) to allow an analysis of the success of these educational goals. The following deadlines apply in the implementation and assessment of Educational Goals:
Dept. of First Nations Studies Undergraduate Program Educational Goals Action Plan

- Progress Report: In year 4 units are expected to produce a Progress Report for internal use and reporting to SFU administration. As part of this document units are expected to report on the assessment of all Educational Goals. For FNST, this will occur between Fall 2020 and Fall 2021.

- Unit Self-Study: Between May and August 2023, which is Year 6, First Nations Studies must produce a Unit Self-Study which is circulated to External Reviewers before their site visits. Assessment of Educational Goals should be included in the Unit Self Study (see Sections 3.2a & b in Senate Guidelines for External Reviews of Academic Units).

- Unit Action Plan: After reviewing the External Review Report, units are expected to produce a Unit Action Plan to address the recommendations from reviewers to plan for the next cycle.

The following timeline recognizes and embodies the iterative nature of the process, following the “Define/Collect/Analyze/Action” cycle proposed by the VPA office and it is modeled on the generic timetable provided by the TLC’s Educational Goals website.

Table B: Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Start Date - End Date</th>
<th>Define</th>
<th>Action &amp; Define</th>
<th>Analyze</th>
<th>Collect</th>
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<tr>
<td>Year 1</td>
<td>Sept 2017-Aug 2018</td>
<td>Define</td>
<td>Initial articulation of course level Ed Goals through syllabi analysis in monthly seminars; ongoing assignment analysis</td>
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<td>Year 2</td>
<td>Sept 2018-Aug 2019</td>
<td>Collect</td>
<td>Gather multiple model assignments over 3 terms; interview graduates in June 2019</td>
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<td>Year 3</td>
<td>Sept 2019-Aug 2020</td>
<td>Analyze</td>
<td>Compare student feedback from 2017 with the interviews from 2019, examine model assignments, and in consultation with instructors, refine and revise course level Ed Goals; recommend change to the curriculum</td>
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<td>Year 4</td>
<td>Sept 2020-Aug 2021</td>
<td>Action &amp; Define</td>
<td>Produce Progress Report. Tentative Date for implementation of a Master’s Degree in FNS; initial articulation of course level Ed Goals in MA through monthly seminars</td>
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<td>Year 5</td>
<td>Sept 2021-Aug 2022</td>
<td>Collect</td>
<td>Gather multiple model assignments for both programs over 3 terms; interview graduates for both the undergrad and grad program</td>
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<td>Year 6</td>
<td>Sept 2022-Aug 2023</td>
<td>Analyze</td>
<td>Evaluate data; recommend changes to curriculum; revise goals. Prepare Self-Study for external review</td>
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<td>Year 7</td>
<td>Sept 2023-Aug 2024</td>
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4. Strategies for Data Collection and Analysis:

a. Syllabi analysis
Detailed course outlines describe the content and objectives of each course offered by the Department. While there are standard Educational Goals for each course, there are differences in syllabi in each iteration taught by the same instructor as he or she adapts the curriculum to the new year and also differences between instructors who bring their own innovations to each course. FNS will begin by scheduling a meeting with instructors of the same core courses to review various syllabi and articulate together the educational goals of each course. Of particular interest in the context of educational goals are those courses that all students must complete.

b. Assignment analysis
As well as mapping the educational goals onto the curriculum (Table A), the Department has begun to compile a detailed list of the assignments used in each course to evaluate student progress and assign grades. These assignments are designed to capture how well the student has mastered the material in each course, and by mapping specific educational goals related to each assignment, we will be able to build our insights into how the educational goals are being promoted and the balance between them. This project will include further data in the Year 4 Project Report, due by August 2021, but we share below a number of examples from early analysis to illustrate the concept. (In the following boxes, an X marks an assignment that relates to/ measures progress towards the educational goal. “A” denotes an assignment and “E” an exam.)

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Dept. of First Nations Studies Undergraduate Program Educational Goals Action Plan

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<tr>
<td>law/policy/colonial institutions</td>
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c. Writing samples and other evidence
The Department will collect assignments completed at the highest level from all core courses in the 2018/19 year—although assignments from all courses and from previous years can also be included—as a way to demonstrate work done at an A level. All of this will be done with the permission of students. Upon full collection in August 2019, FNS will call a special meeting for faculty to discuss the goals of each course as evidenced in the sample and discuss any concerns with the achievements of our entire student body. At this point instructors can articulate what makes these assignments successful and discuss the reasons behind this excellent work (whether it be the talent, initiative, creativity, and effort of the students, the clear rubrics for each assignment, the time and resources available to support the production of the work, etc.). Instructors can then recommend amendments to course instruction, policy, or university resources that could help support students to complete work at an improved level.

d. Direct student feedback
This following survey will be duplicated in Spring 2019 and compared with this survey, completed by our student body in February 2017. This initial survey is small and so the data should not be given excessive weight, but remains worth noting. The large majority of respondents (11) were fairly or well advanced in their studies (more than 90 units completed).

Students were asked whether their knowledge in the broad areas identified under our educational goals had been improved by their engagement in First Nations Studies:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Neutral</th>
</tr>
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<tbody>
<tr>
<td>The histories and cultures of Indigenous peoples of North America</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>The critical contemporary issues facing Indigenous people</td>
<td>14</td>
<td></td>
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<tr>
<td>The ethical processes and communication of research, including Indigenous ethics and protocols</td>
<td>13</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>The impacts of institutions behind colonization (e.g., residential schools)</td>
<td>13</td>
<td>2</td>
<td></td>
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<tr>
<td>The legacy of legal and political decisions regarding Indigenous peoples (the reserve system, the Indian Act)</td>
<td>14</td>
<td>1</td>
<td></td>
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</table>

Students were asked whether their skills had improved in the following areas:

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<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Neutral</th>
</tr>
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<tbody>
<tr>
<td>Critical analysis of social and cultural issues</td>
<td>15</td>
<td></td>
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</tbody>
</table>
Dept. of First Nations Studies Undergraduate Program Educational Goals Action Plan

| Identification of assumptions about Indigenous people in texts and media | 13 | 2 |
| Use of modern library/archival research techniques | 11 | 1 | 3 |
| Oral communication of research and knowledge | 11 | 1 | 3 |
| Written communication of research and knowledge | 13 | | 2 |
| Diverse methods to recast learned knowledge (eg. through interactive work, studio work, etc.) | 10 | 2 | 3 |

5. Final Notes

It is worth reflecting on the assessment by the Dean of the Faculty of Arts and Social Sciences, in her October 11, 2017 comments and endorsement of the Action Plan.

The [FNS] Department plans to pursue several important recommendations. At the undergraduate level, these range from increasing course selection offerings for specific high demand courses, to more general plans to build (grow) the undergraduate program with curricular changes reflecting key Calls to Action flowing from the report of the Truth and Reconciliation Commission, while being careful about how the unit provides leadership and service teaching in the context of the University’s commitment to indigenization. The department does not currently have a graduate program, but following up on a key recommendation, plans to launch a graduate program in three years-time in order to assist in efforts to build the next generation of Indigenous academics.

The external reviewers identify significant working environment issues, evident in relation to teaching, service and administration. At one the challenge is three-fold; very small faculty complement (3.5 FTE) combined with a disproportionate demand on faculty time to serve on institution-wide committees or engage in institutional initiatives, and time-intensive community/collaborative research practices. The unit is requesting significant faculty renewal.

The Department of First Nations Studies is committed to the Educational Goals process as a way to build additional accountability into its procedures. But we also appreciate that our work is essential for the further Indigenization of the Faculty of Arts and Social Sciences and for the university as a whole. Our ambitions to provide a first-rate undergraduate program and develop a high quality graduate program depends on the commitment of the university to add to our small complement.

As was evident in the external review, each faculty member within First Nations Studies is completing remarkable work whether it be at the level of research, teaching, or service. The only way to make it possible to improve any aspect of its is to add to its numbers.
MEMORANDUM

ATTENTION: Senate
FROM: Daniel Leznoff, Chair
Senate Committee on Undergraduate Studies
RE: Course Changes (SCUS 18-01)

DATE: January 12, 2018
PAGES: 1/1

For information:

Acting under delegated authority at its meeting of January 11, 2018 SCUS approved the following curriculum revisions effective Fall 2018.

a. Faculty of Health Sciences (SCUS 18-01a)
   (i) Prerequisite change for HSCI 416 and 474

b. Faculty of Science (SCUS 18-01b)
   1. Department of Biomedical Physiology and Kinesiology
      (i) Deletion of reference to KIN courses from prerequisite entries for all BPK courses
      (ii) Deletion of BPK 111, 212 and 461
      (iii) Prerequisite change for BPK 407, 491 and 495
      (iv) Prerequisite, title and description change for BPK 426
   2. Department of Physics
      (i) Prerequisite changes for PHYS 101 and 102
      (ii) Title, description and prerequisite change for PHYS 332
      (iii) Title and description change for PHYS 390
      (iv) Title and prerequisite change for PHYS 431
      (v) Description change for PHYS 432
   3. Department of Statistics and Actuarial Science
      (i) Prerequisite change for STAT 302 and 305
COURSE SUBJECT | HSCI | NUMBER | 416 | TITLE | Health Services Research

**TYPE OF CHANGES.** Please type 'X' for the appropriate revision(s):

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<tr>
<th>Course number</th>
<th>Units</th>
<th>Prerequisite</th>
<th>Description</th>
<th>Equivalent Statement</th>
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**WORDING/DESCRIPTION EDITS.** Indicate deleted or changed text using strike-through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Prerequisite: HSCI majors with 90 units, including HSCI 330 and STAT 302, STAT 302 or STAT 305, and HSCI 307 or HSCI 330.

**EFFECTIVE TERM AND YEAR FOR CHANGES**
Fall, Spring, Summer and year (please enter in textbox)

| FALL 2018 |
RATIONALE (must be included)

The change will increase flexibility for completing prerequisites and improving course access for students.
COURSE SUBJECT: HSCI  
NUMBER: 474  
TITLE: Seminar in Neuropharmacology

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

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Prerequisite: HSCI 323 and either HSCI 321 or MBB 331.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

FALL 2018
The change would align HSCI 486 prerequisites with other upper division HSCI course prerequisites.
COURSE MODIFICATION FORM

COURSE SUBJECT  |  BPK  |  NUMBER  |  XXX  |  TITLE  |  ALL COURSES

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

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WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

BPK (or KIN) XXX

Students with credit for KIN XXX may not repeat this course for credit.

See attached document with Course descriptions for all BPK courses with the specific changes for each course. For four courses: BPK 407, 426, 491 and 495 course modification forms are provided for further calendar changes for those courses.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

RATIONALE (must be included)

It is seven years since BPK courses transitioned from the KIN course subject. Reference to KIN courses should be removed from prerequisite entries for all BPK courses.

November 2016
COURSE SUBJECT: BPK  
NUMBER: 111  
TITLE: Food and Food Safety

RATIONALE (must be included)

The course was used for the Human Nutrition Certificate. There are no students registered in the certificate and termination of the certificate is being requested concurrent with this request. A request to remove BPK 111 from the Kinesiology Minor has been submitted concurrently with this request. There are no plans to offer this course in the future.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (enter in textbox)  
Fall 2018

PLEASE DO THE FOLLOWING:

1. Attach a program impact list along with your course deletion form. Contact the Senate and Academic Services Office (sfu-cal@sfu.ca) for a program impact list.
2. Once you have the program impact list, please review how deleting this course affects each program's requirements.
3. If more substantial changes are required to programs as a result of this deletion, please also submit a program modification form.
4. If no further changes other than deletion is required in program requirements, please list those programs in the box below:

Kinesiology Minor

5. Lastly, please conduct a course impact analysis, which reviews the effect of a course number change and/or course deletion on course prerequisites. For instructions on how to do a course impact analysis, please visit our page and click on “deleting a course” and review Step 2. Course Impact Analysis.
COURSE SUBJECT: BPK  
NUMBER: 212  
TITLE: Food and Society

Rationale (must be included)

The course was used for the Human Nutrition Certificate. There are no students registered in the certificate and termination of the certificate is being requested concurrent with this request. A request to remove BPK 212 from the Kinesiology Minor has been submitted concurrently with this request. There are no plans to offer this course in the future.

Effective term and year for changes

Fall, Spring, Summer and year (enter in textbox) Fall 2018

Please do the following:

1. Attach a program impact list along with your course deletion form. Contact the Senate and Academic Services Office (sfusal@sfu.ca) for a program impact list.
2. Once you have the program impact list, please review how deleting this course affects each program's requirements.
3. If more substantial changes are required to programs as a result of this deletion, please also submit a program modification form.
4. If no further changes other than deletion is required in program requirements, please list those programs in the box below:

Kinesiology Minor

5. Lastly, please conduct a course impact analysis, which reviews the effect of a course number change and/or course deletion on course prerequisites. For instructions on how to do a course impact analysis, please visit our page and click on “deleting a course” and review Step 2. Course Impact Analysis.
RATIONAL (must be included)

This was a CODE course on ageing that has been discontinued. This has been replaced by a Special Topics CODE course with a different emphasis on Ageing taught by Dawn Mackey. This has been taught successfully and will be brought forward in the future to be given a regular course number and take its place 461 in the course requirements.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (enter in textbox) 

Fall 2018

PLEASE DO THE FOLLOWING:

1. Attach a program impact list along with your course deletion form. Contact the Senate and Academic Services Office (sfucal@sfu.ca) for a program impact list.
2. Once you have the program impact list, please review how deleting this course affects each program's requirements.
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4. If no further changes other than deletion is required in program requirements, please list those programs in the box below:

5. Lastly, please conduct a course impact analysis, which reviews the effect of a course number change and/or course deletion on course prerequisites. For instructions on how to do a course impact analysis, please visit our page and click on “deleting a course” and review Step 2. Course Impact Analysis.
COURSE SUBJECT | BPK | NUMBER | 407 | TITLE | Human Physiology Laboratory

**TYPE OF CHANGES.** Please type 'X' for the appropriate revision(s):

- Course number □
- Units □
- Prerequisite □
- Title □
- Description □
- Equivalent □

**WORDING/DESCRIPTION EDITS.** Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

**EFFECTIVE TERM AND YEAR FOR CHANGES**

Fall, Spring, Summer and year (please enter in textbox)

- Fall 2018

**RATIONALE (must be included)**

The students should have the 305 and 306 prerequisite knowledge before taking 407. Since BPK 407 is a lab course, there is minimal time to discuss theory during the lab. If a student is taking 305 or 306 concurrently with 407 they may not have the appropriate physiology theory before they take a specific 407 lab. This would put the student at a disadvantage. Thus the option for taking one of them concurrently should be deleted.

BPK 306 prior to Fall 2017 had overlap in content with the new BPK 307 course.

Reference to equivalent KIN courses is being deleted from prerequisites in all BPK courses.
COURSE SUBJECT: BPK 491

TITLE: Undergraduate Honours Thesis Proposal

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

☐ Course number
☐ Units
☒ Prerequisite

☐ Title
☐ Description
☐ Equivalent Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

BPK 491 - Undergraduate Honours Thesis Proposal (3)
Only students in the honours program may enroll in BPK 491. Prerequisite: 90 units, BPK (or KIN) 304W (may be taken concurrently) and permission of the chair of the undergraduate program committee. **A minimum grade of B in this course is needed to register in BPK 495 or BPK 499.** Students with credit for BPK (or KIN) 497 may not take this course for further credit.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

RATIONALE (must be included)

Clarification that a minimum B grade is required to register in BPK 495 and 499. This already is present in the BPK 499 prerequisite language.
BPK 495 - Undergraduate Honours Research Performance (6)
Student will perform an individual research project under the guidance and supervision of a faculty member. The project will carry out the research for the honours thesis proposed in BPK 491 - Undergraduate Honours Thesis Proposal. Prerequisite: BPK 491 (minimum grade of B). Co-requisite: BPK 499. Only students in the honours program may enroll in BPK 495. Students with credit for BPK 499 prior to Fall 2016 may not take this course for further credit.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)
Fall 2018

RATIONALE (must be included)
Clarification that a minimum B grade in BPK 491 is required to register in this course. This already is present in the BPK 499 prerequisite language

November 2016
COURSE MODIFICATION FORM

COURSE SUBJECT  BPK  NUMBER  426  TITLE  Neuromuscular Anatomy

TYPE OF CHANGES. Please type ‘X’ for the appropriate revision(s):

Course number  ☒  Units  ☒  Prerequisite  ☒

Title  ☒  Description  ☒  Equivalent Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

Title:  Neuromuscular Anatomy  Functional Human Neuroanatomy

Description:
This course explores human neuromuscular anatomy using a lecture format supplemented by course readings, an anatomy atlas and tutorials which are presented in an interactive fashion via the Macintosh Computer Laboratory on campus. A strong grounding will be given in neuroanatomy with additional emphasis on the limb musculature and its innervation.

Students will critically assess and investigate functional neuroanatomy and examine how neuroimaging, animal models, and functional deficits in patients inform this knowledge. The course encompasses divisions of the human nervous system from both functional (sensory, motor, and autonomic) and anatomical (peripheral and central) perspectives, including the neural basis of higher cortical functions.

Prerequisite:
BPK (or KIN) 324 or BPK (or KIN) 325 or BPK 306 and (or KIN) BPK 326. Students with credit for KIN 426 may not complete this course for further credit.

November 2016
EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

New title is a better descriptor of course content.

Modified description better describes the current content of the course

Requiring BPK 306 will enable us to assume necessary anatomical topics have been covered allowing less overlap and more in depth discussion of neuroanatomy.

Reference to equivalent KIN courses is being deleted from prerequisites in all BPK courses

RATIONALE (must be included)

November 2016
COURSE SUBJECT PHYS | NUMBER 101 | TITLE Physics for the Life Sciences I

TYPE OF CHANGES. Please type ‘X’ for the appropriate revision(s):

Course number □
Units □
Prerequisite □

Title □
Description □
Equivalent □
Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

Recommended Corequisite: PHYS 132.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

RATIONALE (must be included)

Following introduction of our new first year lab courses, PHYS 132 and PHYS 133, and cancellation of one of our older first year lab courses, PHYS 130, we recommend PHYS 101/102 students take PHYS 132/133 as corequisites.

November 2016
# COURSE MODIFICATION FORM

## SFU

**SENATE COMMITTEE ON UNDERGRADUATE STUDIES**

**COURSE MODIFICATION FORM**

Page 1 of 1

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- Units □
- Prerequisite □
- Title □
- Description □
- Equivalent □
- Statement □

**WORDING/DESCRIPTION EDITS.** Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

Recommended Corequisites: MATH 152, 155 or 158, PHYS 130 and PHYS 133.

**EFFECTIVE TERM AND YEAR FOR CHANGES**

Fall, Spring, Summer and year (please enter in textbox)

- Fall 2018

**RATIONALE (must be included)**

Following introduction of our new first year lab courses, PHYS 132 and PHYS 133, and cancellation of one of our older first year lab courses, PHYS 130, we recommend PHYS 101/102 students take PHYS 132/133 as corequisites.

November 2016
COURSE SUBJECT  PHYS  NUMBER  332  TITLE  Optics Laboratory

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number  ☐  Units  ☐  Prerequisite  ☑
Title  ☑  Description  ☑  Equivalent  ☐  Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

Optics Laboratory
Experiments in optics and modern physics, including diffraction, interference, spectroscopy, lasers and holography. Engineering Science students will do a selected set of experiments. Students with credit for PHYS 332 may not take this course for further credit. Prerequisite: Either PHYS 233 or both (PHYS 231 and CHEM 266) and either PHYS 285 or CHEM 260 all with a minimum grade of C-. Students with credit for PHYS 332 may not take this course for further credit. Writing/Quantitative.

Advanced Physics Laboratory I
Experiments investigating a range of physical phenomena such as Brownian motion, molecular order, chaotic dynamics, Doppler broadening of stellar spectra, and biophysical forces using techniques such as interference, optical trapping, and spectroscopy. Attention will also be given to more general skills, including experimental design, operating and troubleshooting experimental equipment, modeling of experimental results, data analysis, and the presentation of experimental results. Biological Physics students will do a selected set of experiments. Prerequisite: Either PHYS 233 or both (PHYS 231 and either CHEM 266 or PHYS 347) and either PHYS 285 or CHEM 260, all with a minimum grade of C-. PHYS 347 may be taken concurrently. Students with credit for PHYS 332 may not take this course for further credit. Writing/Quantitative.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

November 2016
RATIONALE (must be included)

Rationale: We are working to combine our three advanced labs – PHYS 332, 431 and 433 – into two courses – Advanced Physics Laboratory I and II – and students will be able to select from a wider range of topics. The labs that are currently part of PHYS 433 will be incorporated into PHYS 332 and students in the Biological Physics programs will select from these experiments. The new name emphasizes that this course is the first part of a two semester sequence and the description reflects the broader range of experiments that are available. The addition of PHYS 347 to the list of prerequisites is for the benefit of Biological Physics students.
COURSE SUBJECT  PHYS  NUMBER  390  TITLE  Introduction to Astrophysics

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number  
Units  
Prerequisite  

Title  X  Description  X  Equivalent  
Statement  

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

PHYS 390 - Introduction to Cosmology and Astrophysics

Calendar Description: Characteristics of stars and their evolution, thermodynamics of stellar interior, origin of the elements, galaxies, cosmology, and origin of the planets. Evolution of the universe, modern cosmological models, origins of matter and entropy in the universe, Big Bang nucleosynthesis, formation of large scale structure and galaxies, planetary systems. Quantitative.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

RATIONALE (must be included)

We are updating title and description to reflect evolution of the content since our cosmologists, Andrei Frolov and Levon Pogosian, started teaching the course.

November 2016
COURSE MODIFICATION FORM

**COURSE SUBJECT** | **PHYS** | **NUMBER** | **431** | **TITLE** | Advanced Physics Laboratory I

**TYPE OF CHANGES.** Please type ‘X’ for the appropriate revision(s):

<table>
<thead>
<tr>
<th>Course number</th>
<th>Units</th>
<th>Prerequisite</th>
<th>Title</th>
<th>Description</th>
<th>Equivalent Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>X</td>
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<td></td>
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</tr>
</tbody>
</table>

**WORDING/DESCRIPTION EDITS.** Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

Advanced Physics Laboratory I | Advanced Physics Laboratory II

Advanced experiments in Physics. May include special projects. Prerequisite: PHYS 385 and either PHYS 332 or (PHYS 326 and 465), with a minimum grade of C-. Quantitative.

**EFFECTIVE TERM AND YEAR FOR CHANGES**

Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

**RATIONALE (must be included)**

The new name emphasizes that it is the second part of a two semester sequence.

The prerequisite change is necessary because this course requires the analysis and writing skills developed in the first course in this sequence, PHYS 332 Advanced Physics Laboratory I.

November 2016
COURSE SUBJECT | PHYS | NUMBER | 432 | TITLE | Undergraduate Honours Thesis

**TYPE OF CHANGES.** Please type 'X' for the appropriate revision(s):

- Course number □
- Units □
- Prerequisite □
- Title □
- Description □
- Equivalent Statement □

**WORDING/DESCRIPTION EDITS.** Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Undergraduate research and preparation of an honours thesis over two consecutive fall and subsequent spring semesters. The research project may be in experimental or theoretical physics. Prospective students must obtain agreement of a faculty member willing to supervise the project. Prerequisite: All students interested in taking this course must consult with their faculty supervisor regarding prerequisites.

**EFFECTIVE TERM AND YEAR FOR CHANGES**
Fall, Spring, Summer and year (please enter in textbox)

Fall 2018

**RATIONALE (must be included)**

We have adopted a cohort model for this course and want to make sure the students are aware of this and of the expected scheduling of this course.
COURSE SUBJECT: STAT  
NUMBER: 302  
TITLE: Analysis of Experimental and Observational Data

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number  
Title  
Units  
Prerequisite  
Description  
Equivalent Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

The standard techniques of multiple regression analysis, analysis of variance, and analysis of covariance, and their role in observational and experimental studies. Prerequisite: Any STAT course (except STAT 100), or BUEC 232, or ARCH 376. This course may not be used to satisfy the upper division requirements of the Statistics major or honours program. Quantitative.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

1187

RATIONALE (must be included)

A lower division STAT course is the best preparation for upper division STAT courses. BUEC 232 provides sufficient preparation. Other courses provide insufficient preparation.
COURSE SUBJECT: STAT
NUMBER: 305
TITLE: Introduction to Biostatistical Methods for Health Sciences

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

□ Course number
□ Units
□ Prerequisite □
□ Title
□ Description
□ Equivalent Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using strike-through, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the “Equivalency statements” section under Information about specific course components if changing equivalent statement(s).

Intermediate statistical techniques for the health sciences. Review of introductory concepts in statistics and probability including hypothesis testing, estimation and confidence intervals for means and proportions. Contingency tables and the analysis of multiple 2x2 tables. Correlation and regression. Multiple regression and model selection. Logistic regression and odds ratios. Basic concepts in survival analysis. Prerequisite: Any STAT course (except STAT 100), or BUEC 232, or ARCH 376. This course may not be used to satisfy the upper division requirements of the Statistics major or honours program. Quantitative.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)
1187

RATIONALE (must be included)
A lower division STAT course is the best preparation for upper division STAT courses. BUEC 232 provides sufficient preparation. Other courses provide insufficient preparation.

November 2016
For information:

Acting under delegated authority at its meeting of January 11, 2018 SCUS approved the following curriculum revisions effective Fall 2018.

a. Faculty of Arts and Social Sciences (SCUS 17-48)

1. School for International Studies (SCUS 17-48d)

   (i) New Course Proposals:
   - IS 373-4, Global Environmental Politics
COURSE SUBJECT  IS  NUMBER 373

COURSE TITLE LONG — for Calendar/schedule, no more than 100 characters including spaces and punctuation
Global Environmental Politics

COURSE TITLE SHORT — for enrollment/transcript, no more than 30 characters including spaces and punctuation
Global Environmental Politics

CAMPUS where course will be normally taught:  □ Burnaby  □ Surrey  ✔ Vancouver  □ Great Northern Way  □ Off campus

COURSE DESCRIPTION — 50 words max. Attach a course outline. Don’t include WQB or prerequisites info in this description box.

Examines international efforts to respond to global environmental challenges, such as climate change, deforestation, and the degradation of the oceans. Investigates obstacles to effective action and possible ways forward. Explores the role of a range of key actors, including states, intergovernmental organizations, multinational companies, NGOs, and social movements.

REPEAT FOR CREDIT  □ YES  ✔ NO  Total completions allowed

Library Resources
NOTE: Senate has approved (S.93-11) that no new course should be approved by Senate until funding has been committed for necessary library materials. Each new course proposal must be accompanied by the email that serves as proof of assessment. For more information, please visit www.lib.sfu.ca/about/overview/collections/course-assessments.

RATIONALE FOR INTRODUCTION OF THIS COURSE

This course complements the School’s offerings in its International Development, Economic and Environmental Issues stream. It does so by providing an intensive examination of the political dimensions of global environmental change and by assessing international efforts to mitigate environmental problems.
SCHEDULING AND ENROLLMENT INFORMATION

Effective term and year (e.g. FALL 2016)  Summer 2018

Term in which course will typically be offered  □ Spring  □ Summer  □ Fall

Other (describe)

Will this be a required or elective course in the curriculum?  □ Required  □ Elective

What is the probable enrollment when offered?  Estimate:  35

UNITS
Indicate number of units:  4

Indicate no. of contact hours:  □ Lecture  □ Seminar  □ Tutorial  □ Lab  □ Other; explain below

OTHER

FACULTY
Which of your present CFL faculty have the expertise to offer this course?

Brenda Lyshaug, Tamir Moustafa

WQB DESIGNATION
(attach approval from Curriculum Office)

PREREQUISITE AND / OR COREQUISITE

45 units
EQUIVALENT COURSES [For more information on equivalency, see Equivalency Statements under Information about Specific Course Components.]

1. SEQUENTIAL COURSE [is not hard coded in the student information management system (SIMS).]

Students who have taken (place relevant course(s) in the blank below (ex: STAT 100)) first may not then take this course for further credit.

2. ONE-WAY EQUIVALENCY [is not hard coded in SIMS.]

(Place relevant course(s) in the blank below (ex: STAT 100)) will be accepted in lieu of this course.

3. TWO-WAY EQUIVALENCY [is hard coded and enforced by SIMS.]

Students with credit for (place relevant course(s) in the blank below (ex: STAT 100)) may not take this course for further credit.

Does the partner academic unit agree that this is a two-way equivalency?  □ YES  ✔ NO

Please also have the partner academic unit submit a course change form to update the course equivalency for their course(s).

4. SPECIAL TOPICS PRECLUSION STATEMENT [is not hard coded in SIMS.]

FEES

Are there any proposed student fees associated with this course other than tuition fees?  □ YES  ✔ NO

COURSE - LEVEL EDUCATIONAL GOALS (OPTIONAL)
RESOURCES
List any outstanding resource issues to be addressed prior to implementation: space, laboratory equipment, etc:

None.

OTHER IMPLICATIONS
Final exam required  ✔️ YES  ☐ NO
Criminal Record Check required  ☐ YES  ✔️ NO

OVERLAP CHECK
Checking for overlap is the responsibility of the Associate Dean.
Each new course proposal must have confirmation of an overlap check completed prior to submission to the Faculty Curriculum Committee.

Name of Originator
Ellen Yap
MEMORANDUM

ATTENTION: Senate
FROM: Daniel Leznoff, Chair
Senate Committee on Undergraduate Studies
RE: Program Changes

DATE: January 12, 2018
PAGES: 1/1

For information:

Acting under delegated authority at its meeting of January 11, 2018 SCUS approved the following curriculum revisions effective Fall 2018.

a. Faculty of Health Sciences (SCUS 18-02)

(i) Requirement changes to the Health Sciences Major-Bachelor of Arts and Bachelor of Sciences – Life Sciences Concentration and Population and Quantitative Health Sciences Concentration

b. Faculty of Science (SCUS 18-03)

1. Department of Biomedical Physiology and Kinesiology (SCUS 18-03a)

   (i) Upper division requirement changes to the Biomedical Physiology Major and Honours programs
   (ii) Upper and lower division requirement changes to the Kinesiology Minor program
   (iii) Upper division requirement changes to the Kinesiology Major and Honours programs

2. Department of Mathematics (SCUS 18-03b)

   (i) Lower division requirement changes to the Mathematics and Computing Science Joint Honours program

3. Department of Physics (SCUS 18-03c)

   (i) Upper division requirement changes to the APPH Majors and Honours programs
   (ii) Upper division requirement changes to the BPPH Majors and Honours programs
   (iii) Upper division requirement changes to the MAPH Honours program
   (iv) Requirement changes to the PHYS Honours program

4. Department of Statistics and Actuarial Science (SCUS 18-03d)

   (i) Upper and Lower division requirement changes to the STAT minor
Calendar Entry Change  
Faculty of Health Sciences

Rationale for change:

A significant percentage of the students in the Faculty of Health Sciences pursue professional training in health careers, where the admission requirements for these professional programs require a minimum of 90 academic units. This proposal allows students in the Faculty of Health Sciences to take advantage of a similar policy in the Faculty of Science. For students who leave SFU before completion of their degree to enter competitive professional programs, this policy will ensure that they will be considered SFU alumni without compromising their academic training.

Effective term and year: Fall 2018

The following program(s) will be affected by these changes:

Health Sciences major – Bachelor of Arts

Health Sciences major – Bachelor of Science – Life Sciences Concentration and Population and Quantitative Health Sciences Concentration

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Transfer Credit and Baccalaureate Degrees for Students Who Successfully Complete Second Year of Professional Training in Health Careers.

Students who complete at least 90 units in a Faculty of Health Sciences degree program and are accepted into an approved program in medicine, dentistry, optometry, or veterinary medicine are eligible for a Simon Fraser University baccalaureate degree from the Faculty of Health Sciences after successful completion of the second professional study year. To be acceptable, courses completed in the professional program must not duplicate those already completed at Simon Fraser University and must be acceptable for transfer credit in a major, joint major, or honours program. Candidates must apply for transfer credit by requesting a Letter of Permission (LOP) and apply to graduate. As an official transcript of the work completed in the first two years of the approved program is required for transfer credit, application for graduation should be made in the summer term following the completion of program.

February 2016
Calendar Entry Change
Name of Program  Biomedical Physiology Major

Rationale for change:
Since BPK 417 or 417W have a strong physiological component they are appropriate to include in to the upper division electives list for Biomedical Physiology Major

Effective term and year: Fall 2018

The following program(s) will be affected by these changes:
Biomedical Physiology Major

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Biomedical Physiology Major

Program Requirements

and five of

BPK 301 - Biomechanics Laboratory (3)
BPK 308 - Experiments and Models in Systems Physiology (3)
BPK 310 - Exercise/Work Physiology (3)
BPK 336 - Histology (3)
BPK 340 - Active Health: Behavior and Promotion (3)
BPK 401 - Muscle Biomechanics (3)
BPK 402 - Mechanical Behavior of Biological Tissues (3)
BPK 412 - Molecular Cardiac Physiology (3)
BPK 415 - Neural Control of Movement (3)

**BPK 417 or 417W Obesity, Adipocyte Function and Weight Management**

BPK 420 - Selected Topics in Kinesiology I (3) *
BPK 421 - Selected Topics in Kinesiology II (3) *
BPK 422 - Selected Topics in Kinesiology III (3) *
BPK 423 - Selected Topics in Kinesiology IV (3) *
BPK 426 - Neuromuscular Anatomy (3)
BPK 430 - Human Energy Metabolism (3)
BPK 431 - Integrative Cancer Biology (3)
BPK 432 - Physiological Basis of Temperature Regulation (3)

April 2016
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPK 444</td>
<td>Cardiac Disease: Pathophysiology and Assessment (3)</td>
<td></td>
</tr>
<tr>
<td>BPK 446</td>
<td>Neurological Disorders (3)</td>
<td></td>
</tr>
<tr>
<td>BPK 448</td>
<td>Rehabilitation of Movement Control (3)</td>
<td></td>
</tr>
<tr>
<td>BPK 458</td>
<td>Prevention and Management of Cardiovascular Disease (3)</td>
<td></td>
</tr>
<tr>
<td>BPK 484</td>
<td>Altitude and Aerospace Physiology (3)</td>
<td></td>
</tr>
</tbody>
</table>

A maximum of six units from the following may be used towards the above requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPK 496</td>
<td>Directed Study Literature (3)</td>
<td></td>
</tr>
<tr>
<td>BPK 498</td>
<td>Directed Study Experiential (3)</td>
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</tbody>
</table>
Calendar Entry Change
Name of Program  Biomedical Physiology Honours

Rationale for change:
Since BPK 417 or 417W have a strong physiological component they are appropriate to include in to the upper division electives list for Biomedical Physiology Honours

Effective term and year: Fall 2018

The following program(s) will be affected by these changes:
Biomedical Physiology Honours

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Biomedical Physiology Honours

Program Requirements

and five of

BPK 301 - Biomechanics Laboratory (3)
BPK 308 - Experiments and Models in Systems Physiology (3)
BPK 310 - Exercise/Work Physiology (3)
BPK 336 - Histology (3)
BPK 340 - Active Health: Behavior and Promotion (3)
BPK 401 - Muscle Biomechanics (3)
BPK 402 - Mechanical Behavior of Biological Tissues (3)
BPK 412 - Molecular Cardiac Physiology (3)
BPK 415 - Neural Control of Movement (3)
BPK 417 or BPK 417W Obesity, Adipocyte Function and Weight Management
BPK 420 - Selected Topics in Kinesiology I (3) *
BPK 421 - Selected Topics in Kinesiology II (3) *
BPK 422 - Selected Topics in Kinesiology III (3) *
BPK 423 - Selected Topics in Kinesiology IV (3) *
BPK 426 - Neuromuscular Anatomy (3)
BPK 430 - Human Energy Metabolism (3)
BPK 431 - Integrative Cancer Biology (3)
BPK 432 - Physiological Basis of Temperature Regulation (3)
BPK 444 - Cardiac Disease: Pathophysiology and Assessment (3)

April 2016
BPK 446 - Neurological Disorders (3)
BPK 448 - Rehabilitation of Movement Control (3)
BPK 458 - Prevention and Management of Cardiovascular Disease (3)
BPK 484 - Altitude and Aerospace Physiology (3)

A maximum of six units from the following may be used towards the above requirements

BPK 496 - Directed Study Literature (3) *
BPK 498 - Directed Study Experiential (3) *
Calendar Entry Change
Name of Program  Kinesiology Minor

Delete BPK 111, 212 and 461 from the calendar
Rationale: None of these courses have been offered recently and there are no plans to offer them in the future

Add 304W to the list of elective courses from which 4 courses can be selected.
Also include Lower Division and Upper Division requirements headings and the indication that extra prerequisite courses may be required, both of which are present in the BIF Minor listing but not in the KIN Minor listing.

Additions to the KIN Minor listing in the table below are indicated by bold font and underlining of the text.
Rationale: KIN Minors are now being approved to do Directed Studies when the BPK 304W or equivalent prerequisite is in place. BIF Minors already have BPK 304W listed in their list from which 2 courses can be selected. This change would also facilitate Minors acquiring their upper division writing course requirement.

Effective term and year: Fall 2018

The following program(s) will be affected by these changes:
Kinesiology Minor

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Kinesiology Minor

Note that students cannot combine a kinesiology minor with any other major or minor in the areas of biomedical physiology and behavioural neuroscience.

Program Requirements KIN minor
Lower Division Requirements
Students complete
BPK 142 - Introduction to Kinesiology (3)
and one of
BPK 105 - Fundamentals of Human Structure and Function (3)

April 2016
<table>
<thead>
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<th>Course Code</th>
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<tbody>
<tr>
<td>BPK 205</td>
<td>Introduction to Human Physiology (3)</td>
</tr>
<tr>
<td>BPK 208</td>
<td>Introduction to Physiological Systems (3)</td>
</tr>
<tr>
<td></td>
<td>and three of the following, one of which must be a 200 division course</td>
</tr>
<tr>
<td>BPK 110</td>
<td>Human Nutrition: Current Issues (3)</td>
</tr>
<tr>
<td><strong>BPK 111</strong></td>
<td><strong>Food and Food Safety (3)</strong></td>
</tr>
<tr>
<td>BPK 140</td>
<td>Contemporary Health Issues (3)</td>
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<tr>
<td>BPK 143</td>
<td>Exercise: Health and Performance (3)</td>
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<tr>
<td>BPK 180W</td>
<td>Introduction to Ergonomics (3)</td>
</tr>
<tr>
<td>BPK 201</td>
<td>Biomechanics (3)</td>
</tr>
<tr>
<td>BPK 207</td>
<td>Sensorimotor Control and Learning (3)</td>
</tr>
<tr>
<td><strong>BPK 212</strong></td>
<td><strong>Food and Society (3)</strong></td>
</tr>
<tr>
<td>BPK 241</td>
<td>Sports Injuries - Prevention and Rehabilitation (3)</td>
</tr>
</tbody>
</table>

**Upper Division Requirements**

and one of

- BPK 325 - Basic Human Anatomy (3) +
- BPK 342 - Active Health (3) +

and four of

( note that some classes may require additional pre-requisites):

- BPK 301 - Biomechanics Laboratory (3)
- BPK 303 - Kinanthropometry (3)
- **BPK 304W** - Inquiry and Measurement in Biomedical Physiology and Kinesiology (3) ++
- BPK 305 - Human Physiology I (3)
- BPK 306 - Human Physiology II (3)
- BPK 310 - Exercise/Work Physiology (3)
- BPK 311 - Applied Human Nutrition (3)
- BPK 312 - Nutrition for Fitness and Sport (3)
- BPK 325 - Basic Human Anatomy (3) +
- BPK 340 - Active Health: Behavior and Promotion (3)
- BPK 342 - Active Health (3) +
- BPK 375 - Human Growth and Development (3)
- BPK 381 - Psychology of Work (3)
- BPK 382 - Workplace Health (3)
- BPK 402 - Mechanical Behavior of Biological Tissues (3)
- BPK 420 - Selected Topics in Kinesiology I (3)
- BPK 421 - Selected Topics in Kinesiology II (3)
- BPK 422 - Selected Topics in Kinesiology III (3)
- BPK 423 - Selected Topics in Kinesiology IV (3)
- BPK 431 - Integrative Cancer Biology (3)
- BPK 458 - Prevention and Management of Cardiovascular Disease (3)
- **BPK 461** - Physiological Aspects of Aging (3)
- GER 040 - Nutrition and Aging (3)
- HSCI 312 - Health Promotion: Individuals and Communities (3)
Calendar Entry Change
Name of Program  Kinesiology Major

Rationale for change:
BPK 461 is being deleted from the calendar
This course has not been offered recently and there are no plans to offer it in the future

Effective term and year: Fall 2018

The following program(s) will be affected by these changes:
Kinesiology Major

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Kinesiology Major

Program Requirements

Active Health and Rehabilitation Concentration

This program option requires a total of at least 60 upper division units, which is composed of the upper division core courses shown above and the following additional requirements.

Students who choose this concentration will complete additional BPK units as specified below, including all of

BPK 303 - Kinanthropometrv (3)
BPK 343 - Active Health: Assessment and Programming (3)

and four of

BPK 307 - Human Physiology III (3)
BPK 308 - Experiments and Models in Systems Physiology (3)
BPK 311 - Applied Human Nutrition (3)
BPK 312 - Nutrition for Fitness and Sport (3)
BPK 375 - Human Growth and Development (3)
BPK 381 - Psychology of Work (3)
BPK 382 - Workplace Health (3)

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<td>Muscle Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>BPK 402</td>
<td>Mechanical Behavior of Biological Tissues</td>
<td>3</td>
</tr>
<tr>
<td>BPK 408W</td>
<td>Cellular Physiology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>BPK 412</td>
<td>Molecular Cardiac Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BPK 415</td>
<td>Neural Control of Movement</td>
<td>3</td>
</tr>
<tr>
<td>BPK 417W</td>
<td>Obesity, Adipocyte Function and Weight Management</td>
<td>3</td>
</tr>
<tr>
<td>BPK 420</td>
<td>Selected Topics in Kinesiology I</td>
<td>3</td>
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<tr>
<td>BPK 421</td>
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</tr>
<tr>
<td>BPK 426</td>
<td>Neuromuscular Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>BPK 431</td>
<td>Integrative Cancer Biology</td>
<td>3</td>
</tr>
<tr>
<td>BPK 432</td>
<td>Physiological Basis of Temperature Regulation</td>
<td>3</td>
</tr>
<tr>
<td>BPK 443</td>
<td>Advanced Exercise Prescription</td>
<td>3</td>
</tr>
<tr>
<td>BPK 444</td>
<td>Cardiac Disease: Pathophysiology and Assessment</td>
<td>3</td>
</tr>
<tr>
<td>BPK 445</td>
<td>Advanced Cardiac Rehabilitation</td>
<td>3</td>
</tr>
<tr>
<td>BPK 446</td>
<td>Neurological Disorders</td>
<td>3</td>
</tr>
<tr>
<td>BPK 448</td>
<td>Rehabilitation of Movement Control</td>
<td>3</td>
</tr>
<tr>
<td>BPK 458</td>
<td>Prevention and Management of Cardiovascular Disease</td>
<td>3</td>
</tr>
<tr>
<td>BPK 461</td>
<td>Physiological Aspects of Aging</td>
<td>3</td>
</tr>
<tr>
<td>BPK 481</td>
<td>Musculoskeletal Disorders</td>
<td>3</td>
</tr>
<tr>
<td>BPK 482</td>
<td>Ergonomics and Rehabilitation</td>
<td>3</td>
</tr>
</tbody>
</table>

A maximum of six units from the following may be used towards the above requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPK 496</td>
<td>Directed Study Literature</td>
<td>3</td>
</tr>
<tr>
<td>BPK 498</td>
<td>Directed Study Experiential</td>
<td>3</td>
</tr>
</tbody>
</table>

April 2016
Calendar Entry Change
Name of Program  Kinesiology Honours

Rationale for change:
BPK 461 is being deleted from the calendar
This course has not been offered recently and there are no plans to offer it in the future

Effective term and year: Fall 2018

The following program(s) will be affected by these changes:
Kinesiology Honours

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Kinesiology Honours

Program Requirements

Active Health and Rehabilitation Concentration

This program option requires a total of at least 60 upper division units, which is composed of the upper division core courses shown above and the following additional requirements.

Students who choose this concentration will complete additional BPK units as specified below, including all of

BPK 303 - Kinanthropometry (3)
BPK 343 - Active Health: Assessment and Programming (3)

and four of

BPK 307 - Human Physiology III (3)
BPK 308 - Experiments and Models in Systems Physiology (3)
BPK 311 - Applied Human Nutrition (3)
BPK 312 - Nutrition for Fitness and Sport (3)
BPK 375 - Human Growth and Development (3)
BPK 381 - Psychology of Work (3)
BPK 382 - Workplace Health (3)

April 2016
BPK 401 - Muscle Biomechanics (3)
BPK 402 - Mechanical Behavior of Biological Tissues (3)
BPK 408W - Cellular Physiology Laboratory (3)
BPK 412 - Molecular Cardiac Physiology (3)
BPK 415 - Neural Control of Movement (3)
BPK 417W - Obesity, Adipocyte Function and Weight Management (3)
BPK 420 - Selected Topics in Kinesiology I (3)
BPK 421 - Selected Topics in Kinesiology II (3)
BPK 422 - Selected Topics in Kinesiology III (3)
BPK 423 - Selected Topics in Kinesiology IV (3)
BPK 426 - Neuromuscular Anatomy (3)
BPK 431 - Integrative Cancer Biology (3)
BPK 432 - Physiological Basis of Temperature Regulation (3)
BPK 443 - Advanced Exercise Prescription (3)
BPK 444 - Cardiac Disease: Pathophysiology and Assessment (3)
BPK 445 - Advanced Cardiac Rehabilitation (3)
BPK 446 - Neurological Disorders (3)
BPK 448 - Rehabilitation of Movement Control (3)
BPK 458 - Prevention and Management of Cardiovascular Disease (3)
BPK 461 - Physiological Aspects of Aging (3)
BPK 481 - Musculoskeletal Disorders (3)
BPK 482 - Ergonomics and Rehabilitation (3)

A maximum of six units from the following may be used towards the above requirements

BPK 496 - Directed Study Literature (3)
BPK 498 - Directed Study Experiential (3)
Calendar Entry Change: Lower Division Requirements for Mathematics and Computing Science Joint Honours Program

Name of Program or Name of Faculty: Department of Mathematics

<table>
<thead>
<tr>
<th>Rationale for change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPT 150 is now a discontinued course. CMPT 295 was not listed as its replacement.</td>
</tr>
</tbody>
</table>

| Effective term and year: Fall 2018 |

<table>
<thead>
<tr>
<th>The following program(s) will be affected by these changes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics and Computing Science Joint Honours Program</td>
</tr>
</tbody>
</table>

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

and all of

- CMPT 150 - Introduction to Computer Design (3)
- CMPT 225 - Data Structures and Programming (3)
- CMPT 276 - Introduction to Software Engineering (3)
- CMPT 295 - Introduction to Computer Systems (3)
- MACM 101 - Discrete Mathematics I (3)
- MACM 201 - Discrete Mathematics II (3)
- MACM 203 - Computing with Linear Algebra (2)
- MACM 204 - Computing with Calculus (2)
- MATH 242 - Introduction to Analysis I (3)
- MATH 251 - Calculus III (3)
- STAT 270 - Introduction to Probability and Statistics (3)
Calendar Entry Change
Name of Program or Name of Faculty: Physics

Rationale for change:

We would like students to have the opportunity to take MATH 462 - Fluid Mechanics as part of this program.

Other changes reflect changes to course names for our upper division physics labs as previously approved.

Effective term and year:

Fall 2018

The following program(s) will be affected by these changes:

APPH Majors

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Students complete a total of 36 units, including all of

MATH 310 - Introduction to Ordinary Differential Equations (3)
PHYS 321 - Intermediate Electricity and Magnetism (3)
PHYS 326 - Electronics and Instrumentation (4)
PHYS 332W - Optics Laboratory - Advanced Physics Laboratory I (4)
PHYS 344 - Thermal Physics (3)
PHYS 385 - Quantum Mechanics I (3)
PHYS 421 - Electromagnetic Waves (3)

and 13 units selected from

CHEM 340 - Materials Chemistry (3)
ENSC 426 - High Frequency Electronics (4)
ENSC 495 - Introduction to Microelectronic Fabrication (4)**
MATH 462 - Fluid Dynamics (3)
NUSC 341 - Introduction to Radiochemistry (3)
NUSC 346 - Radiochemistry Laboratory (2)
PHYS 365 - Semiconductor Device Physics (3)
PHYS 395 - Computational Physics (3) + or MACM 316 - Numerical Analysis I (3)

February 2016
PHYS 431 - Advanced Physics Laboratory
PHYS 455 - Modern Optics (3)
PHYS 465 - Solid State Physics (3)
Calendar Entry Change
Name of Program or Name of Faculty Physics

Rationale for change:

We would like students to have the opportunity to take MATH 462 - Fluid Mechanics as part of this program.

Other changes reflect changes to course names for our upper division physics labs as previously approved.

Effective term and year:

Fall 2018

The following program(s) will be affected by these changes:

APPH Honours

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Students complete a minimum total of 53 units, including all of

MATH 310 - Introduction to Ordinary Differential Equations (3)
PHYS 321 - Intermediate Electricity and Magnetism (3)
PHYS 326 - Electronics and Instrumentation (4)
PHYS 332W - Optics Laboratory - Advanced Physics Laboratory I (4)
PHYS 344 - Thermal Physics (3)
PHYS 384 - Methods of Theoretical Physics I (3)
PHYS 385 - Quantum Mechanics I (3)
PHYS 421 - Electromagnetic Waves (3)
PHYS 431 - Advanced Physics Laboratory I Advanced Physics Laboratory II (4)
PHYS 432 - Undergraduate Honours Thesis (6) ++

and a minimum of 17 additional units chosen from

CHEM 340 - Materials Chemistry (3)
ENSC 426 - High Frequency Electronics (4)
ENSC 495 - Introduction to Microelectronic Fabrication (4) **
MATH 462 - Fluid Dynamics (3)
NUSC 341 - Introduction to Radiochemistry (3)

February 2016
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUSC 346</td>
<td>Radiochemistry Laboratory (2)</td>
<td></td>
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<tr>
<td>PHYS 365</td>
<td>Semiconductor Device Physics (3)</td>
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</tr>
<tr>
<td>PHYS 395</td>
<td>Computational Physics (3) * or MACM 316 - Numerical Analysis I (3)</td>
<td></td>
</tr>
<tr>
<td>PHYS 455</td>
<td>Modern Optics (3)</td>
<td></td>
</tr>
<tr>
<td>PHYS 465</td>
<td>Solid State Physics (3)</td>
<td></td>
</tr>
</tbody>
</table>

February 2016
Calendar Entry Change
Name of Program or Name of Faculty: Physics

Rationale for change:

We would like students to have the opportunity to take MBB 491 as part of this program.

Other changes reflect changes to PHYS 332 previously approved, where BIPH students will do a selected set of experiments.

Effective term and year:

Fall 2018

The following program(s) will be affected by these changes:

BPPH Majors

**Calendar Change:** "to" and "from" sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a **bold.**

Students **must** complete a minimum total of 40 units, including

all of

- MATH 310 - Introduction to Ordinary Differential Equations (3)
- MBB 322 - Molecular Physiology (3)
- MBB 331 - Molecular Biology (3)
- PHYS 321 - Intermediate Electricity and Magnetism (3)
- PHYS 347 - Introduction to Biological Physics (3)
- PHYS 385 - Quantum Mechanics I (3)
- PHYS 433W - Biophysics Laboratory 332W - Advanced Physics Laboratory I (4)

and one of

- CHEM 360 - Thermodynamics and Chemical Kinetics (3)
- MBB 323 - Introduction to Physical Biochemistry (3)
- PHYS 344 - Thermal Physics (3)

and **upper division** MBB and PHYS courses to reach a minimum total of 40 units. MATH 462 may be included amongst these five in **this requirement.** The following courses are suggested:

- MATH 462 - Fluid Dynamics (3)
- MBB 308 - Molecular Biology Laboratory (3)
- MBB 309W - Biochemistry Laboratory (4)

February 2016
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBB 321</td>
<td>Intermediary Metabolism</td>
<td>3</td>
</tr>
<tr>
<td>MBB 342</td>
<td>Introductory Genomics and Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>MBB 421</td>
<td>Nucleic Acids</td>
<td>3</td>
</tr>
<tr>
<td>MBB 422</td>
<td>Biomembranes</td>
<td>3</td>
</tr>
<tr>
<td>MBB 423</td>
<td>Protein Structure and Function</td>
<td>3</td>
</tr>
<tr>
<td><strong>MBB 491</strong></td>
<td><strong>Individual Study Semester</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td>PHYS 395</td>
<td>Computational Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 413</td>
<td>Advanced Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 445</td>
<td>Statistical Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 455</td>
<td>Modern Optics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 492</td>
<td>Special Topics in Physics</td>
<td>3</td>
</tr>
</tbody>
</table>

February 2016
Calendar Entry Change
Name of Program or Name of Faculty Physics

Rationale for change:

We would like students to have the opportunity to take MBB 491/492 as part of this program. This is a second option for a thesis project in the MBB program which allows students to split their research work over two semesters. Both MBB 481/482/483 and MBB 491/492 require MBB 308 and 309W as pre-requisites. These are both optional courses in the BIPH program, but we have added them explicitly.

Other changes reflect changes to PHYS 332 previously approved, where BIPH students will do a selected set of experiments.

Effective term and year:

Fall 2018

The following program(s) will be affected by these changes:

BPPH Honours

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Upper Division Requirements
Students must complete a minimum total of 49 units, including

all of
MATH 310 - Introduction to Ordinary Differential Equations (3)
MBB 322 - Molecular Physiology (3)
MBB 331 - Molecular Biology (3)
PHYS 321 - Intermediate Electricity and Magnetism (3)
PHYS 347 - Introduction to Biological Physics (3)
PHYS 385 - Quantum Mechanics 1 (3)
PHYS 433W - Biophysics Laboratory 332W - Advanced Physics Laboratory 1 (4)

and one of
CHEM 360 - Thermodynamics and Chemical Kinetics (3)
MBB 323 - Introduction to Physical Biochemistry (3)
PHYS 344 - Thermal Physics (3)
and two other upper division MBB or PHYS courses. MATH 462 may be included in these two. The following courses are suggested.

MATH 462 - Fluid Dynamics (3)
MBB 308 - Molecular Biology Laboratory (3)
MBB 309W - Biochemistry Laboratory (4)
MBB 321 - Intermediary Metabolism (3)
MBB 342 - Introductory Genomics and Bioinformatics (3)
MBB 421 - Nucleic Acids (3)
MBB 422 - Biomembranes (3)
MBB 423 - Protein Structure and Function (3)
PHYS 395 - Computational Physics (3)
PHYS 413 - Advanced Mechanics (3)
PHYS 445 - Statistical Physics (3)
PHYS 455 - Modern Optics (3)
PHYS 492 - Special Topics in Physics (3)

and either OPTION A or OPTION B:

OPTION A
Students who choose this option will complete all of either
all of
MBB 308 - Molecular Biology Laboratory (3)
MBB 309W - Biochemistry Laboratory (4)
MBB 481 - Individual Study Semester - Honours Thesis (5)
MBB 482 - Individual Study Semester - Honours Research Performance (5)
MBB 483 - Individual Study Semester - Honours Thesis Defense (5)
or
all of
MBB 308 - Molecular Biology Laboratory (3)
MBB 309W - Biochemistry Laboratory (4)
MBB 491 - Individual Study Semester (5)
MBB 492 - Individual Study Semester (10)

OPTION B
Students who choose this option will complete all of
PHYS 384 - Methods of Theoretical Physics I (3)
PHYS 415 - Quantum Mechanics II (3)
PHYS 421 - Electromagnetic Waves (3)
PHYS 432 - Undergraduate Honours Thesis (6)
PHYS 445 - Statistical Physics (3)

and two other upper division MBB or PHYS courses to reach a minimum total of 49 units. MATH 462 may be included in these two this requirement. The following courses are suggested:

February 2016
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 462</td>
<td>Fluid Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>MBB 308</td>
<td>Molecular Biology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>MBB 309W</td>
<td>Biochemistry Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>MBB 321</td>
<td>Intermediary Metabolism</td>
<td>3</td>
</tr>
<tr>
<td>MBB 342</td>
<td>Introductory Genomics and Bioinformatics</td>
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<tr>
<td>MBB 421</td>
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<tr>
<td>PHYS 395</td>
<td>Computational Physics</td>
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</tr>
<tr>
<td>PHYS 413</td>
<td>Advanced Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 445</td>
<td>Statistical Physics</td>
<td>3</td>
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<tr>
<td>PHYS 455</td>
<td>Modern Optics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 492</td>
<td>Special Topics in Physics</td>
<td>3</td>
</tr>
</tbody>
</table>

February 2016
### Rationale for change:

Mathematical Physics is a joint honours program offered by Physics and Mathematics. Mathematics has recently added a thesis option, MATH 498 + MATH 499. We would like students to have the opportunity to take MATH 498 + MATH 499 instead of PHYS 432 as part of this program.

Other changes reflect changes to course names previously approved.

### Effective term and year:

Fall 2018

### The following program(s) will be affected by these changes:

MAPH Honours

---

**Calendar Change:** “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

and all of

- PHYS 321 - Intermediate Electricity and Magnetism (3)
- PHYS 332W - Optics Laboratory Advanced Physics Laboratory I (4)
- PHYS 344 - Thermal Physics (3)
- PHYS 384 - Methods of Theoretical Physics I (3)
- PHYS 385 - Quantum Mechanics I (3)
- PHYS 413 - Advanced Mechanics (3)
- PHYS 415 - Quantum Mechanics II (3)
- PHYS 421 - Electromagnetic Waves (3)
- PHYS 445 - Statistical Physics (3)

and two of

- PHYS 390 - Introduction to **Cosmology and** Astrophysics (3)
- PHYS 395 - Computational Physics (3)
- PHYS 455 - Modern Optics (3)
- PHYS 465 - Solid State Physics (3)
- PHYS 485 - Particle Physics (3)
- PHYS 490 - General Relativity and Gravitation (3)

February 2016
either
PHYS 432 – Undergraduate Honours Thesis (6)
or both of
MATH 498 – Communication and Research Skills in the Mathematical Sciences (1)
MATH 499W – Honours Research Project (5)
**Program Modification Template**

**Calendar Entry Change**
Name of Program or Name of Faculty  Physics

<table>
<thead>
<tr>
<th>Rationale for change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>We would like students to have the opportunity to take MATH 462 - Fluid Mechanics as part of this program.</td>
</tr>
</tbody>
</table>

| Other changes reflect changes to course titles for PHYS 332 and 431. |

<table>
<thead>
<tr>
<th>Effective term and year:</th>
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<tbody>
<tr>
<td>Fall 2018</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>The following program(s) will be affected by these changes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS Honours</td>
</tr>
</tbody>
</table>

**Calendar Change**: "to" and "from" sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a **bold**.

Students complete a minimum total of 53 units, including all of

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 310</td>
<td>Introduction to Ordinary Differential Equations (3)</td>
</tr>
<tr>
<td>PHYS 321</td>
<td>Intermediate Electricity and Magnetism (3)</td>
</tr>
<tr>
<td>PHYS 332W</td>
<td>Optics Laboratory Advanced Physics Laboratory I (4)</td>
</tr>
<tr>
<td>PHYS 344</td>
<td>Thermal Physics (3)</td>
</tr>
<tr>
<td>PHYS 384</td>
<td>Methods of Theoretical Physics I (3)</td>
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<td>PHYS 421</td>
<td>Electromagnetic Waves (3)</td>
</tr>
<tr>
<td>PHYS 431</td>
<td>Advanced Physics Laboratory I Advanced Physics Laboratory II (4)</td>
</tr>
<tr>
<td>PHYS 432</td>
<td>Undergraduate Honours Thesis (6)</td>
</tr>
<tr>
<td>PHYS 445</td>
<td>Statistical Physics (3)</td>
</tr>
</tbody>
</table>

and twelve additional upper division credits in physics. **MATH 462 can be used to meet this requirement.** PHYS 346 cannot be used to meet this requirement.

February 2016
Calendar Entry Change
Name of Program or Name of Faculty: STAT minor, Faculty of Science

Rationale for change:

1. Mathematical competence is beneficial to STAT minor students. However, calculus is not specifically required in this program. We have thus decided to allow students to take linear algebra (another fundamental subject in mathematics) in lieu of Calculus II.
2. Editorial change to upper division requirements.

Effective term and year: 1187

The following program(s) will be affected by these changes: STAT minor

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: sample. All additions should be marked by a bold.

Lower Division Requirements

Students complete one of

MATH 150 - Calculus I with Review (4)
MATH 151 - Calculus I (3)
MATH 154 - Calculus I for the Biological Sciences (3)
MATH 157 - Calculus I for the Social Sciences (3)

and one of

MATH 152 - Calculus II (3)
MATH 155 - Calculus II for the Biological Sciences (3)
MATH 158 - Calculus II for the Social Sciences (3)
MATH 232 - Applied Linear Algebra (3)
MATH 240 - Algebra I: Linear Algebra (3)

and one of

STAT 101 - Introduction to Statistics (3)
STAT 201 - Statistics for the Life Sciences (3)
STAT 203 - Introduction to Statistics for the Social Sciences (3)
STAT 270 - Introduction to Probability and Statistics (3)
BUEC 232 - Data and Decisions I (4)

April 2016
Upper Division Requirements

A minimum of 11 of the 15 upper division STAT units must be completed using STAT courses. The remaining 4 units may be substituted with upper division non-STAT units that focus on statistical inference, study design, or quantitative reasoning, such as BUS 336. The eligibility of other non-STAT courses will be at the discretion of departmental advisors. Recommended STAT courses are listed below.
For information:
Acting under delegated authority and at its meeting of January 8, 2018, SGSC approved the following course changes, effective Fall 2018:

Faculty of Communication, Arts and Technology
1) Prerequisite change: CA 813
2) Description and prerequisite change: CA 829, CA 822
3) Prerequisite removal (no attachment): CA 821, CA 822, CA 823, CA 825, CA 826, CA 827, CA 888

Faculty of Environment
4) Units change: REM 699
5) Units change: REM 899

Faculty of Health Sciences
6) Temporary Withdrawal: HSCI 838

Special Arrangements
7) Creation of a new acronym INS (Individualized Interdisciplinary Studies) to replace SAR (Special Arrangements)
8) Change all SAR courses to reflect new acronym INS
The following course change and prerequisite removals have been approved by the Faculty of Communication, Art and Technology at its meeting of November 15th, 2017 and are forwarded to the Senate Graduate Studies Committee for approval. These curriculum items should be effective for Fall 2018. Please include them on the next SGSC agenda.

School for the Contemporary Arts
Course changes: CA 813, CA 822, CA 829

Prerequisite removal: CA 821 and FPA 821, CA 822 and FPA 822, CA 823 and FPA 823, CA 825 and FPA 825, CA 826 and FPA 826, CA 827 and FPA 827, CA 888 and FPA 888

Stuart Poyntz
Associate Dean, FCAT
Chair, FCAT Graduate Studies Committee
ATTENTION Stuart Poyntz, Chair, FCAT GPC

FROM Arne Eigenfeldt, Graduate Chair, Contemporary Arts

RE Housekeeping Curriculum changes

DATE November 7 2017

On November 3, 2017, the following curriculum revisions have been approved by Elspeth Pratt, the director of the School for the Contemporary Arts, and are forwarded to the Faculty of Communication, Art and Technology Graduate Studies Committee for approval. These curriculum items should be effective for Fall 2018.

1. Course change: CA 813 pre-requisite
2. Course change: CA 822 the description and prerequisite
3. Course change: CA 829 the description and prerequisite
4. The following courses should have their pre-requisite “enrollment in MA in Comparative Media Arts or permission of the instructor” removed.
   - CA 821 and FPA 821
   - CA 822 and FPA 822
   - CA 823 and FPA 823
   - CA 825 and FPA 825
   - CA 826 and FPA 826
   - CA 827 and FPA 827
   - CA 888 and FPA 888

The rationale is that this is the only graduate program in Contemporary Arts with electives. The MFA program has no electives therefore it is unlikely students will enroll in these courses. Any students from outside Contemporary Arts would require permission of the instructor by default.

Sincerely,

Arne Eigenfeldt
Professor,
Chair, Graduate Program
School for the Contemporary Arts
Graduate Course Change

Attach a separate document if more space is required.

<table>
<thead>
<tr>
<th>Course Subject/Number</th>
<th>Units</th>
<th>Effective Term and Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA 813</td>
<td>5</td>
<td>Fall 2018</td>
</tr>
</tbody>
</table>

Course Title
Interdisciplinary Graduate Seminar II

Rationale for Change:
As the pre-req for CA 812 is CA 811, it is not necessary to list that the requirements are CA 811 or CA 812

Proposed Changes (Check all that apply)

- Course number
- Units
- Title
- Description
- Prerequisite
- Other

Complete only the fields to be changed

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
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### SENATE GRADUATE STUDIES COMMITTEE APPROVAL

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- Course Attribute:
- Course Attribute Value:
- Instruction Mode:
- Attendance Type:
- If different from regular units:
  - Academic Progress Units:
  - Financial Aid Progress Units:

Page 2 of 2 Revised May 2015
Graduate Course Change

Attach a separate document if more space is required.

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<td>CA 822</td>
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Course Title: Research Colloquium in Comparative Media Arts

Rationale for Change:
Calendar Description change for clarity and stronger explanation of what occurs in the course

Proposed Changes (Check all that apply)

- [ ] Course number
- [X] Units*
- [X] Title
- [X] Description
- [X] Prerequisite
- [ ] Other

Complete only the fields to be changed

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<td>Course Short Title (max 30 characters)</td>
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<tr>
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<td>Description see attached</td>
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<tr>
<td>Prerequisite Enrollment in MA in Comparative Media Arts or permission of instructor.</td>
<td>Prerequisite</td>
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From: Spring 2018

CA 822 - Research Colloquium in Comparative Media Arts (4)

The research colloquium is a core course taken in the final semester of the MA program. It develops students' research presentation skills and other aspects of professional development. In it students develop two extended research essays under the supervision of the faculty member leading the colloquium. The course guides students in methods of writing extended prose works, including strategies to move through writer's block. We will devote time to developing public presentation skills for a variety of venues. Students submit drafts of their extended essays to their peers and make a formal presentation, followed by detailed discussion. Peer review evaluates the framing of the research topic and research problem, timeliness, originality, appropriateness of research methods, depth of research, structure and effectiveness of argument, and style. Students are guided in peer review, developing useful and specific comments that will help their peers in revising the essay for publication. In the colloquium students also learn how to develop their work for publication, including identifying their audience, choosing an appropriate venue for publication, and submitting their work for publication. We discuss issues regarding publication such as permissions for reproducing artworks, contracts, and responding to peer review.

To: Fall 2018

CA 822 - Research Colloquium in Comparative Media Arts (4)

The research colloquium, a core course taken in the final term of the MA program, focuses on professional development in careers in the arts or PhDs. Through intensive peer review, students revise their extended essays (CA 829) for publication. They identify their audiences, choose appropriate journals, and other venues for publication, and prepare to submit their work, and plan their responses to journal decisions. We discuss permission, contracts, and other intellectual-property issues. Students practice job and grant applications, prepare CVs and cover letters, and work on their public profiles. Students also explore extending their research into curating and public programming. We devote time to public presentation skills for a variety of venues including the final symposium, in which they present their research to the public.
Graduate Course Change

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**Course Title**
Extended Essays in Comparative Media Arts

**Rationale for Change:**
Reduction in prerequisites to allow students to take the course in the summer term. Also simplifying description.

**Proposed Changes (Check all that apply)**

- [ ] Course number
- [ ] Units*
- [ ] Title
- [x] Description
- [x] Prerequisite
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**Description**
see attached

**Prerequisite**
CA (or FPA) 821, Research Methods and three of the following: CA (or FPA) 823, 824, 825, and 826, and permission of the MA program coordinator

**Other**

*Program requirements may need to be revised when course units are changed. Please review the calendar and submit any relevant program revisions resulting from this course change.*
**REMINDER:** All course changes must be identified on a cover memo and confirmed as approved when submitted to FGSC and SGSC.

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  - **Financial Aid Progress Units:**

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Page 2 of 2 Revised May 2015
CA 829 - Extended Essays in Comparative Media Arts (6)

These two essays, the final project of the MA, are completed in the fourth semester of the program. The extended essays build on knowledge students have gained in coursework. Students research in-depth two related topics in comparative media arts and develop and polish an original argument, with the goal of producing at least one essay suitable for publication. The length of each essay should be that of a typical academic journal article in the media arts, about 5000-7000 words. Students may also write catalogue essays or similar nonacademic publications, supplemented by a research essay. Students research the extended essays with the supervision of their senior supervisor. They develop and polish it in the Research Colloquium, CA 822. In the colloquium they write the essay proposal and drafts, give and receive peer review, prepare to submit the essays for publication, and prepare to make a 20-minute public presentation of their research at the culminating research symposium. Students may enroll in the extended essays continuously beginning in the third (summer) semester if they wish, or they may enroll in it in the fourth (fall) semester only. Grading: The essays are evaluated by two faculty members. They jointly assign a grade of In Progress/Complete.

To: Fall 2018

CA 829 - Extended Essays in Comparative Media Arts (6)

These two essays are the final project of the MA. The extended essays build on knowledge students have gained in coursework. Students research in-depth two related topics in comparative media arts and develop and polish an original argument, with the goal of producing at least one essay suitable for publication. The length of each essay should be that of a typical academic journal article in the media arts, about 5000-7000 words. Students may also write catalogue essays or similar nonacademic publications, supplemented by a research essay. Students research each extended essays with the supervision of two faculty members. They prepare them for publication in the Research Colloquium, CA 822. Grading: The essays are evaluated by two supervisors. They jointly assign a grade of In Progress/Complete.
To: Dr. Jeff Derksen, Dean of Graduate Studies / Chair of SGSC
From: Dr. Dongya Yang, Chair, Faculty of Environment Graduate Studies Committee
cc: Dr. Sean Markey, Chair, REM Graduate Program Committee
Date: Dec 14, 2017
Re: A new thesis stream for the MRM program in REM

The Faculty of Environment Graduate Studies Committee has approved the proposal from the School of Resource and Environmental Management (REM) to create a thesis stream to add to the existing MRM program.

I am submitting the document package to the SGSC committee for approval

1. Memo from the Graduate Chair of REM
2. New Graduate Course Proposal Form REM697
3. Graduate Course Change Form REM899
4. Revised Calendar Entry

Should you have any questions or concerns, please feel free to contact.

Dongya Yang, Ph.D., Professor
Associate Dean of Research and Graduate Studies
Dear Dongya,

Attached, please find a calendar entry for the proposed MRM (Thesis) stream (recently approved by the REM GSC and REM Exec). The thesis stream is a long-discussed option within the School of Resource and Environmental Management (REM). The department is motivated to introduce the thesis stream option now for a variety reasons, including student interest, faculty interest in having more dedicated research-intensive students, and considerations regarding completion times for our existing MRM program (i.e. that having a dedicated thesis option will create more realistic parameters for the course-based MRM program, specifically related to the scale and scope of the capstone project).

The thesis stream required courses are intended to preserve and ensure the REM identity for our thesis students related to cross-disciplinary foundations in ecosystem functioning, ecological economics, and policy/social dimensions of resource management. The program meets the commonality requirement as stipulated by the University.

Please note that REM 698 – Field Resource Management Workshop, is a three-day intensive field trip at the start of the program for both thesis and course-based students. REM 801 – Principles of Research Methods, is spread out over the first two terms, with a core deliverable of a research design proposal at the end of the second term.

Also attached: 1) the new course form for the MRM thesis; and 2) revised PhD thesis course to match credits (so that the MRM thesis, optically, does not carry more credits).

We would appreciate if you could facilitate review and vote by the FENV GSC in time to meet the SGSC December 14th materials deadline.

Our thanks to Krista Gerlich-Fitzgerald and the team at Grad Studies for their helpful consultations throughout the development process.

Best,
Sean Markey
Graduate Chair
School of Resource and Environmental Management
## Graduate Course Change

Attach a separate document if more space is required.

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### Course Title
MRM Project

### Rationale for Change:
This change is to better reflect the amount of work necessary for the MRM project.

### Proposed Changes (Check all that apply)

- [ ] Course number
- [x] Units
- [ ] Title
- [ ] Description
- [ ] Prerequisite
- [ ] Other

Complete only the fields to be changed

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<td>Iris Schischmanow</td>
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<th>Department Chair</th>
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<tr>
<td>Sean Cox</td>
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Course Title  PhD Thesis

Rationale for Change:
This change corresponds with units in MRM thesis

Proposed Changes (Check all that apply)

☐ Course number  ☑ Units*  ☐ Title  ☐ Description  ☐ Prerequisite  ☐ Other

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The attached course changes have been approved by the Faculty of Health Sciences and are forwarded to the Senate Graduate Studies Committee for approval. These curriculum items should be effective Fall 2018. Please include them on the next SGSC agenda.

1. Temporary withdrawal: HSCI 838

2. Reformatted Calendar Entry and Program Change to remove HSCI 838 as a requirement—Health Sciences, Master of Public Health—

3. Reformatted Calendar Entries
   Health Sciences, Master of Science
   - Health sciences, Doctor of Philosophy

Timothy Beischlag
Director, Graduate Programs
Graduate Course Temporary Withdrawal

When a course has not been offered in the previous four academic years (or more), it should be considered for temporary withdrawal. The purpose of this policy is to keep the SFU Calendar accurate for prospective and current students. Temporarily withdrawn courses can be reinstated, without going through the regular approval process, by sending a memo to the Graduate Studies office (gradcurric@sfu.ca).

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<td>Course Title</td>
<td>Theorizing Social Inequities and Health</td>
<td></td>
</tr>
<tr>
<td>Reason for Temporary Withdrawal</td>
<td>MPH curriculum reform</td>
<td></td>
</tr>
<tr>
<td>Effective Term and Year</td>
<td>Fall 2018</td>
<td></td>
</tr>
</tbody>
</table>

Before Submission to SGSC check the following:

- Is this course required for degree completion? □ YES □ NO
- Do any program calendar entries need to be changed as a result of this withdrawal? □ YES □ NO
- Does the department's website need to be updated? □ YES □ NO

Program calendar change has been submitted concurrently

REMINDER: All temporary withdrawals must be identified on a cover memo and confirmed as approved when submitted to FGSC and SGSC.

CONTACT PERSON

| Department / School / Program | Faculty of Health Sciences | Contact name | Kellie Smith | Contact email | kellie@sfu.ca |

DEPARTMENTAL APPROVAL

<table>
<thead>
<tr>
<th>Department Graduate Program Committee</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malcolm Steinberg</td>
<td></td>
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<table>
<thead>
<tr>
<th>Department Chair</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Tim Beischlag</td>
<td></td>
<td>Nov 24/17</td>
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</table>

FACULTY APPROVAL

<table>
<thead>
<tr>
<th>Faculty Graduate Studies Committee (FGSC)</th>
<th>Signature</th>
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<tbody>
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<td>Tim Beischlag</td>
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</tr>
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</table>

SENATE GRADUATE STUDIES COMMITTEE APPROVAL

<table>
<thead>
<tr>
<th>Senate Graduate Studies Committee (SGSC)</th>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Jeff Derksen</td>
<td></td>
<td>Jan 18/2017</td>
</tr>
</tbody>
</table>

Revised November 2014
MEMORANDUM

ATTENTION: Jeff Derksen,
Chair of Senate Graduate Studies
Committee (SGSC)

FROM: Ed Park, Graduate Program Chair of
Special Arrangements (SAR)

RE: Program Changes

DATE: December 14, 2017

Special Arrangements program would like to change the program name from Special Arrangements (SAR) to Individualized Interdisciplinary Studies (INS) to reflect the focus of the program and help prospective students, staff and faculty distinguish the program from Cohort Special Arrangements.

Motion 1:
That SGSC approve revision to GGR 1.3.5 effective Fall 2018.

Motion 2:
That SGSC approve the creation of the new acronym INS (Individualized Interdisciplinary Studies) effective Fall 2018.

Motion 3:
That SGSC change the course acronym from SAR to INS for all SAR courses effective Fall 2018.

Attached is a list of our graduate courses with the required editorial changes noted.

Thank you,

Dr. Ed Park
Graduate Program Chair, Special Arrangements
Special Arrangements Courses

INS SAR 890 - Comprehensive Exam
Students must pass a comprehensive examination. The structure of the examination will be determined by the supervisory committee. Graded on a satisfactory/unsatisfactory basis. Prerequisite: Permission of the department.

INS SAR 891 - Directed Readings (1)
To be selected by the student and supervisory committee.

INS SAR 892 - Directed Readings (2)
To be selected by the student and supervisory committee.

INS SAR 893 - Directed Readings (3)
To be selected by the student and supervisory committee.

INS SAR 894 - Directed Readings (4)
To be selected by the student and supervisory committee.

INS SAR 895 - Directed Readings (5)
To be selected by the student and the supervisory committee.

INS SAR 896 - Special Topics (5)
To be selected by the student and the supervisory committee.

INS SAR 897 - President's Dream Colloquium (5)
This special topics course is for students participating in the President's Dream Colloquium. The colloquium is an initiative to bring leading thinkers to SFU and provide an annual forum for intensive interdisciplinary exchange amongst faculty and students in the form of a graduate course. Course registration is through application only. Graded on a satisfactory/unsatisfactory basis.

INS SAR 898 - Master's Thesis (18)

INS SAR 899 - PhD Thesis (6)
MEMORANDUM

ATTENTION Senate

FROM Jeff Derksen,
Chair of Senate Graduate Studies
Committee (SGSC)

RE: New Course Proposals

DATE January 18, 2018

For information:
Acting under delegated authority at the meeting of January 8, 2018, SGSC approved the following new courses, effective Fall 2018:

Faculty of Applied Sciences
1) CMPT 742 Practices in Visual Computing 1
2) CMPT 743 Practices in Visual Computing 2
3) CMPT 757 Frontiers of Visual Computing

Faculty of Environment
4) REM 697 MRM Thesis
MEMORANDUM

Attention  Dr. Jeff Derksen  Date  December 14, 2017
Dean, Graduate Studies

From  Dr. Mirza Faisal Beg  mfbeg@sfu.ca
Faculty of Applied Science, Graduate Studies Committee

Re: Calendar change for courses for the Professional Master’s in Computing Science with specialization in Visual Computing

The faculty of Applied Sciences Graduate Studies Committee would like to send the attached course proposals for the Professional Masters in Computing Science with a specialization in Visual Computing for consideration by SGSC. These have been approved by FGSC by electronic vote.

I request you to please place these on the agenda for the next SGSC meeting.

Cc:  Dr. Greg Mori, Director, School of Computing Science
     Dr. Glenn Chapman, Director, School of Engineering Science
     Dr. Farid Golnaraghi, Director, School of Mechatronic Systems Engineering
Date: 14 December 2017

Dear Faisal and FAS GPC,

Please kindly accept the attached Course Proposals for the new Professional Master's in Visual Computing Courses. This has been approved by the CMPT GPC and discussed at CMPT school meeting and retreat.

Best regards,

Ghassan Hamarneh, PhD

Associate Director for Graduate Studies at the School of Computing Science
BACKGROUND AND RATIONALE

The province of British Columbia currently has the fastest-growing technology sector in Canada, with annual revenue of $26 billion. About 150,000 are employed in tech companies in BC, making it the fastest-growing tech workforce in Canada. Major companies such as Microsoft, Amazon, Boeing, Disney, Sony, and EA are increasingly attracted to BC. To meet the high demand for well-trained and well-qualified graduate students in the tech sector in BC, Canada, and beyond, the School of Computing Science has created a Professional Masters Program in Computer Science. The program currently has a Big Data specialization, training highly qualified personnel specializing in computational methods dealing with Big Data.

In recent years, the digital media and visual computing sector is gaining prominence in BC. Currently, there are 900 companies in the province in this sector. In particular, there are over 60 visual effects (VFX) and animation studios in Vancouver alone, comprising the world’s largest cluster of domestic and foreign-owned studios. This is in part due to a special Interactive Digital Media Tax Credit that has been in place in BC, which provides strong incentives for digital media and visual computing companies to operate in the province.

Most recently in 2017, alternative realities (augmented, virtual, and mixed realities) are reaching a critical mass. Within the past six months, Google, Apple, and Sony have all released major hardware devices and software toolkits (ARKit from Apple, ARCore from Google, and 3D Creator from Sony) that are pushing the boundaries in AR/VR technology. Google Daydream (their AR/VR division) and Apple have been in a “hiring spree” recently, going after qualified personnel with expertise in computer graphics, computer vision, and human-computer interaction (HCI). Vancouver’s AR/VR market is estimated to reach $100 billion by 2025, according to Brad Smith, President of Microsoft Corp. SFU has a large and growing number of researchers working on AR/VR and related technologies. There is on-going effort to build an SFU AR/VR Ecosystem to position SFU as one of the leading Canadian universities on AR/VR research and innovation. A first meeting of minds will happen in early January of 2018.

All of these trends and developments provide strong motivation for the School of Computing Science to expand their Professional Masters Program in Computer Science to the visual computing domain, hence the proposal for a new Specialization in Visual Computing.

We would identify three core areas of research and teaching offering under visual computing: computer graphics, computer vision, and HCI. Other areas that are tied to visual computing include medical imaging, visualization, and robotics. Applications domains for visual computing are numerous, including but are not limited to AR/VR, design and manufacturing, education, medicine, geographical information systems, autonomous driving, robotics, computer games, VFX in games and other media and entertainment fronts.

The School of Computing Science has tremendous strength in visual computing. We have at least 12 faculty members who conduct research in the core and related areas. A prominent computer science ranking website (csrankings.org), which ranks universities and individual researchers based on their publication records in the very top venues in computer science, ranks SFU visual computing highly. Specifically, counting top publications in computer graphics and computer vision, SFU ranks #12 in the world. See:

http://csrankings.org/#/index?vision&graph&world
BACKGROUND AND RATIONALE

Furthermore, SFU Computing Science has a strong track record in training highly qualified personnel in visual computing. For example, doctoral graduates in computer graphics, computer vision, HCI, and visualization from SFU are holding faculty positions in Waterloo, Western, Calgary, Victoria, Carleton, Boston University, and University of Florida, etc. All in all, we believe that our School is strongly positioned to offer a high-quality Professional Masters Program under the Visual Computing Specialization.

Finally, we remark that specialty programs in visual computing now exist in top institutions in the US and Europe; these include Stanford, CMU, University College London, TU Darmstadt, Saarland, Stuttgart, and Swansea. If our Visual Computing Specialization is launched in Fall 2018, it will be the first of its kind in Canada. We are well aware of an existing program in the Center for Digital Media: Master of Digital Media (MDM). However, the goals of that program and our proposed program are clearly different. MDM aims to train project manager type of personnel, in the domain of digital media. This is evident from the six “core competencies” MDM aims to develop: teamwork, design process, self-awareness, time management, articulation, and information literacy. In contrast, our new specialization aims to train technical personnel with algorithmic and software development skills in visual computing.
New Graduate Course Proposal

Attach a separate document if more space is required.

<table>
<thead>
<tr>
<th>Course Subject (eg. PSYC/CMPT)</th>
<th>Number (eg. 810)</th>
<th>Units (eg. 4/6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practices in Visual Computing 1</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Course title (max. 100 characters including spaces and punctuation)</th>
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<tbody>
<tr>
<td>Practices in Visual Computing 1</td>
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<table>
<thead>
<tr>
<th>Short title (for enrollment/transcript - max. 30 characters)</th>
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<tbody>
<tr>
<td>Visual Computing Lab 1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course description for SFU Calendar</th>
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<tbody>
<tr>
<td>Lab practices, combined with instructional offerings, for students to acquire the hands-on experience necessary for a successful career in Visual Computing in the information technology sector. Topics covered will include fundamental and prevalent problems from application domains in the fields of computer graphics, computer vision, human-computer interaction, medical image analysis, as well as visualization.</td>
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<table>
<thead>
<tr>
<th>Rationale for introduction of this course</th>
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<tbody>
<tr>
<td>This is the first of two lab courses for students enrolled into the new Visual Computing Specialization of the Professional Master's program in Computer Science.</td>
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<th>Term of initial offering</th>
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<td>Fall 2018</td>
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<th>Frequency of offerings/year</th>
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<tr>
<td>once per year</td>
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<table>
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<tr>
<th>Equivalent courses (These are previously approved courses that replicate the content of this course to such an extent that students should not receive credit for both courses.)</th>
</tr>
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<tbody>
<tr>
<td>None.</td>
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**Prerequisite and/or Corequisite**

This course is only available to students enrolled into the Visual Computing Specialization of the Professional Master's program in Computer Science.

<table>
<thead>
<tr>
<th>Criminal record check required?</th>
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<td>Yes</td>
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<th>Campus where course will be taught</th>
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<td>Burnaby</td>
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<table>
<thead>
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<th>Course Components</th>
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<td>Lecture</td>
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<th>Grading Basis</th>
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<td>Letter grades</td>
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<tr>
<th>Repeat for credit?</th>
<th>Total repeats allowed?</th>
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<tbody>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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* Course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description.

** If a course is only available to students in a particular program, that should be stated in the prerequisite.

*** If yes, then add this requirement as a prerequisite.

**** This applies to a Special Topics or Directed Readings course.
Required course? □ Yes □ No
Final exam required? □ Yes □ No
Repeat within a term? □ Yes □ No
Combined with an undergrad course? □ Yes □ No
If yes, identify which undergraduate course and what the additional course requirements are for graduate students:

RESOURCES
If additional resources are required to offer this course, the department proposing the course should be prepared to provide information on the sources of those additional resources.

Faculty member(s) who will normally teach this course

Limited term faculty member

Additional faculty members, space, and/or specialized equipment required in order to offer this course

CONTACT PERSON
Department / School / Program: School of Computing Science
Contact name: Richard Zhang
Contact email: haoz@sfu.ca

DEPARTMENTAL APPROVAL
Remember to also include the course outline.
Non-departmentalized faculties need not sign
Department Graduate Program Committee: Ghassan Hamarneh
Department Chair:

OVERLAP CHECK
Overlap check done? □ YES
The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content.

FACULTY APPROVAL
This approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required Library funds and any other necessary resources.

Faculty Graduate Studies Committee (FGSC) Signature: Mirza Faisal Beg
Date: 12/14/2017

SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee (SGSC) Signature: Jeff Derksen
Date: JAN 18 2017

ADMINISTRATIVE SECTION (for DGS office only)
Course Attribute:  
Course Attribute Value:  
Instruction Mode:  
Attendance Type:  
If different from regular units:
Academic Progress Units:  
Financial Aid Progress Units:  

Page 2 of 2 Revised June 9, 2017
Course Outline - CMPT 742 – Practices for Visual Computing 1

Information

Subject: CMPT
Catalog number: 742
Section: D100
Semester: 2018 Fall (1187)
Title: Practices for Visual Computing 1
Instructors(s): Limited Term Faculty Member
Campus: Burnaby Mountain Campus

Calendar Objective/Description

Lab practices, combined with instructional offerings, for students to acquire the hands-on experience necessary for a successful career in Visual Computing in the information technology sector. Topics covered will include fundamental and prevalent problems from application domains in the fields of computer graphics, computer vision, human-computer interaction, medical image analysis, as well as visualization.

Over 13 weeks of lab work and 12 hours per week of lab time, the students will obtain solid and practical problem-solving skills for visual computing.

Topics

- Model-driven vs. data-driven techniques for visual computing
- Geometric machine learning: application of machine learning techniques to model and process 3D shapes and scene data.
- Deep learning techniques for image classification and object recognition.
- Large-scale information visualization
- Interaction techniques for 3D data and environments
- Physics-based modeling and simulation

Grading

12 assignments (100% of grade)

Recommended books


**Academic Honesty Statement**

Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).
# New Graduate Course Proposal

Attach a separate document if more space is required.

| Course Subject (eg. PSYC|CMPT) | Number (eg. 810)743 | Units (eg. 4)16 |
|----------------------------|---------------------|-----------------|
| Course title (max. 100 characters including spaces and punctuation) | Practices in Visual Computing 2 |
| Short title (for enrollment/transcript - max. 30 characters) | Visual Computing Lab 2 |
| Course description for SFU Calendar | Lab practices, combined with instructional offerings, for students to acquire the hands-on experience necessary for a successful career in Visual Computing in the information technology sector. Topics covered will include fundamental and prevalent problems from application domains in the fields of computer graphics, computer vision, human-computer interaction, medical image analysis, as well as visualization. |
| Rationale for introduction of this course | This is the second of two lab courses for students enrolled into the new Visual Computing Specialization of the Professional Master's program in Computer Science. |
| Term of initial offering | Fall 2018 |
| Course delivery (eg. 3 hrs/week for 13 weeks) | 12 hrs/week for 13 weeks |
| Frequency of offerings/year | once per year |
| Estimated enrollment/offering | 25 |
| Equivalent courses (These are previously approved courses that replicate the content of this course to such an extent that students should not receive credit for both courses.) | None. |
| Prerequisite and/or Corequisite ** | CMPT 742 |
| Criminal record check required? | Yes*** |
| Additional course fees? | Yes [No] |
| Campus where course will be taught | Burnaby [Surrey [Vancouver [Great Northern Way [Off campus |
| Course Components | Lecture [Seminar [Lab [Research [Practicum [Independent |
| Grading Basis | Letter grades [Satisfactory or Unsatisfactory [In Progress/Complete |
| Repeat for credit? | Yes [No |
| Total repeats allowed? | |
| Capstone course? | Yes [No |

* Course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description.
** If a course is only available to students in a particular program, that should be stated in the prerequisite.
*** If yes, then add this requirement as a prerequisite.
**** This applies to a Special Topics or Directed Readings course.
### RESOURCES

If additional resources are required to offer this course, the department proposing the course should be prepared to provide information on the source(s) of those additional resources.

**Faculty member(s) who will normally teach this course**

**Limited term faculty member**

Additional faculty members, space, and/or specialized equipment required in order to offer this course

### CONTACT PERSON

<table>
<thead>
<tr>
<th>Department / School / Program</th>
<th>Contact name</th>
<th>Contact email</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Computing Science</td>
<td>Richard Zhang</td>
<td><a href="mailto:haoz@sfu.ca">haoz@sfu.ca</a></td>
</tr>
</tbody>
</table>

### DEPARTMENTAL APPROVAL

Remember to also include the course outline.

Non-departmentalized faculties need not sign

<table>
<thead>
<tr>
<th>Department Graduate Program Committee</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Ghassan Hamameh</td>
<td></td>
<td>Dec. 7, 2017</td>
</tr>
</tbody>
</table>

### OVERLAP CHECK

Overlap check done? **YES**

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content.

### FACULTY APPROVAL

This approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required library funds and any other necessary resources.

<table>
<thead>
<tr>
<th>Faculty Graduate Studies Committee (FGSC)</th>
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<tr>
<td>Mirza Faisal Beg</td>
<td></td>
<td>12/14/2017</td>
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### SENATE GRADUATE STUDIES COMMITTEE APPROVAL

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<tr>
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<td>JAN 1 8 2017</td>
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### ADMINISTRATIVE SECTION (for DGS office only)

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If different from regular units:

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<th>Financial Aid Progress Units</th>
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Information

Subject: CMPT
Catalog number: 743
Section: D100
Semester: 2018 Fall (1187)
Title: Practices for Visual Computing 2
Instructors(s): Limited Term Faculty Member
Campus: Burnaby Mountain Campus

Calendar Objective/Description

Lab practices, combined with instructional offerings, for students to acquire the hands-on experience necessary for a successful career in Visual Computing in the information technology sector. Topics covered will include fundamental and prevalent problems from application domains in the fields of computer graphics, computer vision, human-computer interaction, medical image analysis, as well as visualization.

Over 13 weeks of lab work and 12 hours per week of lab time, and building on the previous lab course CMPT 742, the students will obtain solid and practical problem-solving skills for visual computing.

Topics

• Machine learning in medical image analysis and diagnosis
• Computational photography
• SLAM and UAV for visual data acquisition
• Interaction designs
• Data-driven motion controllers in character animation
• Mobile interactions and augmented reality

Grading

12 assignments (100% of grade)

Recommended books


**Academic Honesty Statement**

Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).
# New Graduate Course Proposal

Attach a separate document if more space is required.

<table>
<thead>
<tr>
<th>Course Subject leg.</th>
<th>PSYC/CMPT</th>
<th>Number (leg. 810)757</th>
<th>Units (leg. 4)3</th>
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</thead>
</table>

## Course title [max. 100 characters including spaces and punctuation]
Frontiers of Visual Computing

## Short title [for enrollment/transcript - max. 30 characters]
Frontiers of Visual Computing

## Course description for SFU Calendar *
A seminar-oriented course covering the latest technological advances and trends in visual computing and relevant domains. The focus is on relating fundamental visual computing concepts and techniques to the inception, evolution, and future prospects of these trend-setting technologies.

## Rationale for introduction of this course
This is a new course created to introduce current popular topics such as AR/VR/MR, digital fabrication, autonomous driving, etc., to students enrolled into the new Visual Computing Specialization of the Professional Master's program in Computer Science.

## Term of initial offering
Fall 2018

## Course delivery (eg. 3 hrs/week for 13 weeks)
3 hrs/week for 13 weeks

## Frequency of offerings/year
Once per year

## Estimated enrollment/offering
25

## Equivalent courses (These are previously approved courses that replicate the content of this course to such an extent that students should not receive credit for both courses.)
None.

## Prerequisite and/or Corequisite •
This course is only available to students enrolled into the Visual Computing Specialization of the Professional Master's program in Computer Science

## Criminal record check required? O Yes • *•

## Additional course fees? O Yes O No

## Campus where course will be taught Q Burnaby & Surrey & Vancouver & Great Northern Way & Off campus

## Course Components Q Lecture O Seminar Q Lab O Research Q Practicum Q Independent •

## Grading Basis Q Letter grades O Satisfactory or Unsatisfactory O In Progress/Complete

## Repeat for credit? **** Q Yes Q No

## Total repeats allowed?

## Capstone course? O Yes O No

* Course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." if the grading basis is satisfactory/unsatisfactory include this in the description.

** If a course is only available to students in a particular program, that should be stated in the prerequisite.

*** If yes, then add this requirement as a prerequisite.

**** This applies to a Special Topics or Directed Readings course.
Required course? Yes [x] No
Final exam required? Yes [x] No
Repeat within a term? Yes [x] No

Combined with an undergrad course? Yes [x] No
If yes, identify which undergraduate course and what the additional course requirements are for graduate students:

RESOURCES
If additional resources are required to offer this course, the department proposing the course should be prepared to provide information on the source(s) of those additional resources.

Faculty members who will normally teach this course:
Yasu Furukawa, Ghassan Hamarneh, Kangkang Yin, Richard Zhang

Additional faculty members, space, and/or specialized equipment required in order to offer this course:

CONTACT PERSON
Department / School / Program: School of Computing Science
Contact name: Richard Zhang
Contact email: haoz@sfu.ca

DEPARTMENTAL APPROVAL
Remember to also include the course outline.

Non-departmentalized faculties need not sign:
Department Graduate Program Committee: Ghassan Hamarneh
Department Chair: Signatures
Date: Dec. 7, 2017

OVERLAP CHECK
Overlap check done? Yes [x]
The course form and outline must be sent by FGSC to the chairs of each FGSC [fgsc-list@sfu.ca] to check for an overlap in content.

FACULTY APPROVAL
This approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required Library funds and any other necessary resources.

Faculty Graduate Studies Committee (FGSC):
Signature: Mirza Faisal Beg
Date: 12/14/2017

SENATE GRADUATE STUDIES COMMITTEE APPROVAL
Signature: Jeff Derksen
Date: Jan 18, 2017

ADMINISTRATIVE SECTION (for DGS office only)
Course Attribute:
Course Attribute Value: ______________
Instruction Mode: ______________
Attendance Type: ______________
If different from regular units:
Academic Progress Units: ______________
Financial Aid Progress Units: ______________
Course Outline - CMPT 757 – Frontiers in Visual Computing

Information

Subject: CMPT  
Catalog number: 757  
Section: D100  
Semester: 2018 Fall (1187)  
Title: Frontiers in Visual Computing  
Instructors(s): Yasu Furukawa, Ghassan Hamarneh, Kangkang Yin, and Richard Zhang, as well as potential guest lecturers.  
Campus: Burnaby Mountain Campus

Calendar Objective/Description

A seminar-oriented course covering the latest technological advances and trends in visual computing and relevant domains. The focus is on relating fundamental visual computing concepts and techniques to the inception, evolution, and future prospects of these trend-setting technologies.

Topics

Topics covered will evolve over time, depending on the latest technological trends in visual computing and related fields. Current topics include but are not limited to:

- Virtual, augmented, and mixed reality basics and their applications in design, medicine, and entertainment
- Computational design and fabrication, including advances and trends in both additive and subtractive manufacturing technologies
- Cutting-edge technologies in computational medicine
- Interaction capture and their applications in animation, AR/MR
- Autonomous driving and the enabling technologies

Grading

3 assignments (45%); one midterm (20%); one final project (35%).

Recommended books

None. Course material will consist of latest research papers, lecture notes, and articles appearing in technology publications.

Academic Honesty Statement
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).
To: Dr. Jeff Derksen, Dean of Graduate Studies / Chair of SGSC  
From: Dr. Dongya Yang, Chair, Faculty of Environment Graduate Studies Committee  
cc: Dr. Sean Markey, Chair, REM Graduate Program Committee  
Date: Dec 14, 2017  
Re: A new thesis stream for the MRM program in REM

The Faculty of Environment Graduate Studies Committee has approved the proposal from the School of Resource and Environmental Management (REM) to create a thesis stream to add to the existing MRM program.

I am submitting the document package to the SGSC committee for approval

1. Memo from the Graduate Chair of REM  
2. New Graduate Course Proposal Form REM697  
3. Graduate Course Change Form REM899  
4. Revised Calendar Entry

Should you have any questions or concerns, please feel free to contact.

Dongya Yang, Ph.D., Professor  
Associate Dean of Research and Graduate Studies
Dear Dongya,

Attached, please find a calendar entry for the proposed MRM (Thesis) stream (recently approved by the REM GSC and REM Exec). The thesis stream is a long-discussed option within the School of Resource and Environmental Management (REM). The department is motivated to introduce the thesis stream option now for a variety reasons, including student interest, faculty interest in having more dedicated research-intensive students, and considerations regarding completion times for our existing MRM program (i.e. that having a dedicated thesis option will create more realistic parameters for the course-based MRM program, specifically related to the scale and scope of the capstone project).

The thesis stream required courses are intended to preserve and ensure the REM identity for our thesis students related to cross-disciplinary foundations in ecosystem functioning, ecological economics, and policy/social dimensions of resource management. The program meets the commonality requirement as stipulated by the University.

Please note that REM 698 – Field Resource Management Workshop, is a three-day intensive field trip at the start of the program for both thesis and course-based students. REM 801 – Principles of Research Methods, is spread out over the first two terms, with a core deliverable of a research design proposal at the end of the second term.

Also attached: 1) the new course form for the MRM thesis; and 2) revised PhD thesis course to match credits (so that the MRM thesis, optically, does not carry more credits).

We would appreciate if you could facilitate review and vote by the FENV GSC in time to meet the SGSC December 14th materials deadline.

Our thanks to Krista Gerlich-Fitzgerald and the team at Grad Studies for their helpful consultations throughout the development process.

Best,
Sean Markey
Graduate Chair
School of Resource and Environmental Management
New Graduate Course Proposal

<table>
<thead>
<tr>
<th>Course Subject (eg. PSYC)</th>
<th>REM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course title (max. 100 characters)</td>
<td>MRM Thesis</td>
</tr>
<tr>
<td>Number (eg. 810)</td>
<td>697</td>
</tr>
<tr>
<td>Units (eg. 4)</td>
<td>18</td>
</tr>
</tbody>
</table>

Course description for SFU Calendar * (course descriptions should be brief and should never begin with phrases such as “This course will...” or “The purpose of this course is...” If the grading basis is satisfactory/unsatisfactory include this in the description)

Thesis course for the MRM - thesis stream degree

Rationale for introduction of this course

Thesis course for the new MRM thesis stream degree

<table>
<thead>
<tr>
<th>Term of initial offering</th>
<th>Fall 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of offerings/year</td>
<td>3/year</td>
</tr>
<tr>
<td>Course delivery (eg. 3 hrs/week for 13 weeks)</td>
<td>n/a</td>
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</tbody>
</table>

| Estimated enrollment/offering | n/a |

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)

| none |

Prerequisite and/or Corequisite

| none |

Criminal record check required?*** | □ Yes |

| Additional course fees? | □ Yes ✔ No |

| Campus where course will be taught | ✔ Burnaby  ✔ Surrey  ✔ Vancouver  ❌ Great Northern Way  ✔ Off campus |

Course Components **

| Lecture | Seminar | Lab | Independent | Capstone |

Grading Basis

| Letter grades | Satisfactory/ Unsatisfactory | In Progress / Complete |

| Repeat for credit? | ✔ Yes | □ No |

| Total repeats allowed? | 2 |

| Repeat within a term? | □ Yes | ✔ No |

| Required course? | ✔ Yes | □ No |

| Final exam required? | □ Yes | ✔ No |

| Capstone course? | ✔ Yes | □ No |

Combined with a undergrad course? | □ Yes | ✔ No |

If yes, identify which undergraduate course and the additional course requirements for graduate students:

---

* Course descriptions should be brief and should never begin with phrases such as “This course will...” or “The purpose of this course is...” If the grading basis is satisfactory/unsatisfactory include this in the description).

** See important definitions on the curriculum website.

*** If yes, then add this requirement as a prerequisite.
RESOURCES

If additional resources are required to offer this course, the department proposing the course should be prepared to provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course

various

Additional faculty members, space, and/or specialized equipment required in order to offer this course

none

CONTACT PERSON

<table>
<thead>
<tr>
<th>Department / School / Program</th>
<th>Contact name</th>
<th>Contact email</th>
</tr>
</thead>
<tbody>
<tr>
<td>REM</td>
<td>Iris Schischmanow</td>
<td><a href="mailto:gradasst@sfu.ca">gradasst@sfu.ca</a></td>
</tr>
</tbody>
</table>

DEPARTMENTAL APPROVAL

<table>
<thead>
<tr>
<th>Department Graduate Program Committee</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sean Markey</td>
<td></td>
<td>Nov 24, 2017</td>
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</tbody>
</table>

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<tr>
<th>Department Chair</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Sean Cox</td>
<td></td>
<td>Nov 24, 2017</td>
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<tr>
<th>Non-departmentalized faculties need not sign</th>
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</table>

OVERLAP CHECK

Overlap check done? **YES**

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content.

FACULTY APPROVAL

This approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required Library funds and any other necessary resources.

<table>
<thead>
<tr>
<th>Faculty Graduate Studies Committee (FGSC)</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Dongya Yang</td>
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<tr>
<th>SENATE GRADUATE STUDIES COMMITTEE APPROVAL</th>
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<tr>
<td>Senate Graduate Studies Committee (SGSC)</td>
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<tr>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Jeff Derksen</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE SECTION (for DGS office only)

Course Attribute: GCAP
Course Attribute Value: Thesis
Instruction Mode: 
Attendance Type: 

If different from regular units:
Academic Progress Units: 
Financial Aid Progress Units: 

Page 2 of 2 Revised June 9, 2017
MEMORANDUM

ATTENTION: Senate
FROM: Jeff Derksen,
Chair of Senate Graduate Studies Committee (SGSC)
RE: Program Changes

DATE January 18, 2018

For information:
Acting under delegated authority at its meeting of January 8, 2018, SGSC approved the following program changes, effective Fall 2018:

Faculty of Applied Sciences
  1) Computer Science, MSc

Faculty of Environment
  2) Resource and Environmental Management, MRM

Faculty of Health Sciences
  3) Health Sciences, MPH
  4) Health Sciences, MSc
  5) Health Sciences, PhD
MEMORANDUM

Attention Dr. Jeff Derksen Date December 14, 2017
Dean, Graduate Studies

From Dr. Mirza Faisal Beg mfbeg@sfu.ca
Faculty of Applied Science, Graduate Studies Committee

Re: Calendar change for courses for the Professional Master's in Computing Science with specialization in Visual Computing

The faculty of Applied Sciences Graduate Studies Committee would like to send the attached course proposals for the Professional Masters in Computing Science with a specialization in Visual Computing for consideration by SGSC. These have been approved by FGSC by electronic vote.

I request you to please place these on the agenda for the next SGSC meeting.

Cc: Dr. Greg Mori, Director, School of Computing Science
    Dr. Glenn Chapman, Director, School of Engineering Science
    Dr. Farid Golnaraghi, Director, School of Mechatronic Systems Engineering
Date: 14 December 2017

Dear Faisal and FAS GPC,

Please kindly accept the attached Course Proposals for the new Professional Master’s in Visual Computing Courses. This has been approved by the CMPT GPC and discussed at CMPT school meeting and retreat.

Best regards,

Ghassan Hamarneh, PhD

Associate Director for Graduate Studies at the School of Computing Science
BACKGROUND AND RATIONALE

The province of British Columbia currently has the fastest-growing technology sector in Canada, with annual revenue of $26 billion. About 150,000 are employed in tech companies in BC, making it the fastest-growing tech workforce in Canada. Major companies such as Microsoft, Amazon, Boeing, Disney, Sony, and EA are increasingly attracted to BC. To meet the high demand for well-trained and well-qualified graduate students in the tech sector in BC, Canada, and beyond, the School of Computing Science has created a **Professional Masters Program in Computer Science**. The program currently has a Big Data specialization, training highly qualified personnel specializing in computational methods dealing with Big Data.

In recent years, the digital media and **visual computing** sector is gaining prominence in BC. Currently, there are 900 companies in the province in this sector. In particular, there are over 60 visual effects (VFX) and animation studios in Vancouver alone, comprising the world’s largest cluster of domestic and foreign-owned studios. This is in part due to a special Interactive Digital Media Tax Credit that has been in place in BC, which provides strong incentives for digital media and visual computing companies to operate in the province.

Most recently in 2017, alternative realities (augmented, virtual, and mixed realities) are reaching a critical mass. Within the past six months, Google, Apple, and Sony have all released major hardware devices and software toolkits (ARKit from Apple, ARCore from Google, and 3D Creator from Sony) that are pushing the boundaries in AR/VR technology. Google Daydream (their AR/VR division) and Apple have been in a “hiring spree” recently, going after qualified personnel with expertise in **computer graphics, computer vision, and human-computer interaction (HCI)**. Vancouver’s AR/VR market is estimated to reach $100 billion by 2025, according to Brad Smith, President of Microsoft Corp. SFU has a large and growing number of researchers working on AR/VR and related technologies. There is on-going effort to build an **SFU AR/VR Ecosystem** to position SFU as one of the leading Canadian universities on AR/VR research and innovation. A first meeting of minds will happen in early January of 2018.

All of these trends and developments provide strong motivation for the School of Computing Science to expand their Professional Masters Program in Computer Science to the visual computing domain, hence the proposal for a new **Specialization in Visual Computing**.

We would identify three core areas of research and teaching offering under visual computing: **computer graphics, computer vision, and HCI**. Other areas that are tied to visual computing include medical imaging, visualization, and robotics. Applications domains for visual computing are numerous, including but are not limited to AR/VR, design and manufacturing, education, medicine, geographical information systems, autonomous driving, robotics, computer games, VFX in games and other media and entertainment fronts.

The School of Computing Science has tremendous strength in visual computing. We have at least 12 faculty members who conduct research in the core and related areas. A prominent computer science ranking website (csrankings.org), which ranks universities and individual researchers based on their publication records in the very top venues in computer science, ranks SFU visual computing highly. Specifically, counting top publications in computer graphics and computer vision, SFU ranks #12 in the world. See:

http://csrankings.org/#/index?vision&graph&world
Furthermore, SFU Computing Science has a strong track record in training highly qualified personnel in visual computing. For example, doctoral graduates in computer graphics, computer vision, HCI, and visualization from SFU are holding faculty positions in Waterloo, Western, Calgary, Victoria, Carleton, Boston University, and University of Florida, etc. All in all, we believe that our School is strongly positioned to offer a high-quality Professional Masters Program under the Visual Computing Specialization.

Finally, we remark that specialty programs in visual computing now exist in top institutions in the US and Europe; these include Stanford, CMU, University College London, TU Darmstadt, Saarland, Stuttgart, and Swansea. If our Visual Computing Specialization is launched in Fall 2018, it will be the first of its kind in Canada. We are well aware of an existing program in the Center for Digital Media: Master of Digital Media (MDM). However, the goals of that program and our proposed program are clearly different. MDM aims to train project manager type of personnel, in the domain of digital media. This is evident from the six “core competencies” MDM aims to develop: teamwork, design process, self-awareness, time management, articulation, and information literacy. In contrast, our new specialization aims to train technical personnel with algorithmic and software development skills in visual computing.
Admission Requirements

To qualify for admission to the Professional Master of Science in Computer Science, a student must satisfy the university admission requirements for a master's program as stated in Section 1.3.3 of the Graduate Admission section of the SFU calendar, and the student must hold a bachelor's degree, or equivalent in computer science or a related field, with a cumulative grade point average (GPA) of 3.00 (on a scale of 0.00 - 4.33) or the equivalent. Alternatively, a minimum GPA of 3.33/4.33 on the last 60 credits of undergraduate courses will also meet the GPA requirements for admission to the program.

The School's Graduate Admissions Committee may offer, at its discretion, M.Sc. admission to exceptional students without an undergraduate degree in computer science or a related field. Minimally we require demonstrated competence in computer science at the third year level equivalent to CMPT 300 (Operating Systems 1), CMPT 307 (Data Structures and Algorithms) and CMPT 354 (Database Systems).

Students who do not have the proper background in computer science may take the three courses listed above in the Summer semester before the Fall cohort begins and then join the program.

Program Requirements

Students will complete a minimum of 30 units of graduate work. These units are divided into three sections: a minimum of 15 units of discipline specific graduate course work; 12 units of specialized lab work involving advanced industry relevant programming; 3 to 6 units of integrated learning via co-op.

Course Work for Big Data Specialization (at least 15 units)

CMPT 726 - Machine Learning (3)

One of

CMPT 705 - Design and Analysis of Algorithms (3)
CMPT 706 - Design and Analysis of Algorithms for Big Data (3) *
CMPT 711 - Bioinformatics Algorithms (3)

https://www.sfu.ca/students/calendar/2018/spring/programs/computer-science/master-of-science.html
At least two of

CMPT 741 - Data Mining (3) *
CMPT 756 - Systems For Big Data (3) *
CMPT 767 - Visualization (3)
CMPT 825 - Natural Language Processing (3)
IAT 814 - Knowledge, Visualization and Communication (3)
STAT 852 - Modern Methods in Applied Statistics (4)

One of

CMNS 815 - Social Construction of Communication Technologies (5)
CMPT 829 - Special Topics in Bioinformatics (3)
CMPT 880 - Special Topics in Computing Science (3)
CMPT 881 - Special Topics in Theoretical Computing Science (3)
CMPT 882 - Special Topics in Artificial Intelligence (3)
CMPT 884 - Special Topics in Database Systems (3)
CMPT 885 - Special Topics in Computer Architecture (3)
CMPT 886 - Special Topics in Operating Systems (3)
CMPT 888 - Special Topics in Computer Graphics, HCI, Vision and Visualization (3)
CMPT 889 - Special Topics in Interdisciplinary Computing (3)
CMPT 894 - Directed Reading (3)

Other courses with permission of the School.

Note that STAT 652 - Statistical Learning (3) can be used in place of STAT 852 with permission of the School.

* Recommended

Lab Work for Big Data Specialization (12 units)

Students will take the following two lab courses worth 6 units each. Only students enrolled in the Professional Master of Science in Computer Science (Big Data) will be permitted to enroll in these courses:

CMPT 732 - Programming for Big Data 1 (6)
CMPT 733 - Programming for Big Data 2 (6)

Co-op (3 or 6 units)

A co-op placement is an integral part of this program. Students will register for one or two co-op terms. With assistance from the co-op coordinator and co-op student advisor for this program, students will be expected to find a suitable industry partner for the co-op placement. The student may instead choose to conduct research in Applied Computer Science at one of the various Computing Science research labs or elsewhere inside the University as a paid research assistant to satisfy the co-op requirement. In extenuating circumstances, a student may appeal to the program director to take an elective course from the list of electives for this program instead of a co-op. Students are required to enroll in at least one of the required courses in the term following the co-op term(s).

Academic Requirements within the Graduate General Regulations

All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
Computer Science
PROFESSIONAL MASTER OF SCIENCE

Description of Program
The Professional Master's program in Computer Science engages students in developing deep knowledge and practical skills in specialized areas of computer science. The program trains computational specialists who can construct models, develop algorithms, and write software using state-of-the-art graduate-level knowledge and techniques. Students take instructional and lab courses, in a cohort, and complete work placement through SFU’s co-op program, allowing them to tackle real-world scientific, engineering, and social-economical problems and gain valuable project management experiences while expanding their network of industrial contacts. This full-time Master’s program/specializations are suitable for students with a strong aptitude in computer science, or other quantitative fields, such as engineering and mathematics.

Admission Requirements
A student must satisfy the university admission requirements for a Master's program as stated in Section 1.3.3 of the Graduate Admission section of the SFU calendar, and the student must hold a bachelor's degree, or equivalent in computer science or a related field, with a minimum cumulative grade point average (GPA) of 3.00 (on a scale of 0.00 - 4.33) or the equivalent. Alternatively, a minimum GPA of 3.33/4.33 on the last 60 credits of undergraduate courses will also meet the GPA requirements for admission to the program.

The School's Graduate Admissions Committee may offer, at its discretion, admission the Professional Master's program to exceptional students without an undergraduate degree in computer science or a related field. Minimally we require demonstrated competence in computer science at the third year level equivalent to CMPT 300 (Operating Systems 1), CMPT 307 (Data Structures and Algorithms), and CMPT 354 (Database Systems).

Students who do not have the proper background in computer science may take the three courses listed above in the summer semester before the fall cohort begins and then join the program.

Program Requirements
This program consists of core courses, co-op, and a choice of specialization in big data or visual computing for a minimum of 30 units.

Students complete all of
CMPT 726 - Machine Learning (3)

and one of
CMPT 705 - Design and Analysis of Algorithms (3)
CMPT 706 - Design and Analysis of Algorithms for Big Data (3) *
CMPT 757 - Frontiers of Visual Computing (3) **
CMPT 813 - Computational Geometry (3)

and at least two of
CMPT 741 - Data Mining (3) *
CMPT 756 - Systems For Big Data (3) *
CMPT 761 - Image Synthesis (3)
CMPT 764 - Geometric Modelling in Computer Graphics (3) **
CMPT 767 - Visualization (3)
REVISED
CALENDAR ENTRY

CMPT 820 - Multimedia Systems (3)
CMPT 822 - Computational Vision (3) **
CMPT 825 - Natural Language Processing (3)
STAT 852 - Modern Methods in Applied Statistics (4)
IAT 814 - Knowledge, Visualization and Communication (3)

and one of
CMNS 815 - Social Construction of Communication Technologies (5)
CMPT 829 - Special Topics in Bioinformatics (3)
CMPT 880 - Special Topics in Computing Science (3)
CMPT 881 - Special Topics in Theoretical Computing Science (3)
CMPT 882 - Special Topics in Artificial Intelligence (3)
CMPT 884 - Special Topics in Database Systems (3)
CMPT 885 - Special Topics in Computer Architecture (3)
CMPT 886 - Special Topics in Operating Systems (3)
CMPT 888 - Special Topics in Computer Graphics, HCl, Vision and Visualization (3) **
CMPT 889 - Special Topics in Interdisciplinary Computing (3)
CMPT 894 - Directed Reading (3)

and a minimum of one co-op term
CMPT 626 - Graduate Co-op Practicum 1 (3)

Big Data Specialization
Students complete all of above requirements and both of
CMPT 732 - Programming for Big Data 1 (6)
CMPT 733 - Programming for Big Data 2 (6)

or

Visual Computing Specialization
Students complete all of the above requirements and both of
CMPT 742 - Practices for Visual Computing 1 (6)
CMPT 743 - Practices for Visual Computing 2 (6)

*Recommended for students in the Big Data specialization
**Recommended for students in the Visual computing Specialization

Co-op
A co-op internship is an integral part of this program. Students will register for one or two co-op terms. The latter option is in place to satisfy requests from our industrial partners. Some industrial partners prefer two co-op terms for better continuity since one term may not offer sufficient time to carry out a large-scale project. With assistance from the co-op coordinator for this program, students will be expected to find a suitable industry partner for the co-op placement. The student may instead choose to conduct research into big data at one of the various research labs in the School of Computing Science as a paid research assistant to satisfy their co-op requirement. In extenuating circumstances, a student may appeal to the program director to take an elective course from the list of electives for this program instead of a co-op term. Students are required to enroll in at least one of the program courses in the term following the co-op term(s).

Program Length
Students are expected to complete the program requirements in four terms.

Academic Requirements within the Graduate General Regulations

All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
To: Dr. Jeff Derksen, Dean of Graduate Studies / Chair of SGSC

From: Dr. Dongya Yang, Chair, Faculty of Environment Graduate Studies Committee

cc: Dr. Sean Markey, Chair, REM Graduate Program Committee

Date: Dec 14, 2017

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3. Graduate Course Change Form REM899
4. Revised Calendar Entry

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Dongya Yang, Ph.D., Professor
Associate Dean of Research and Graduate Studies
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The thesis stream required courses are intended to preserve and ensure the REM identity for our thesis students related to cross-disciplinary foundations in ecosystem functioning, ecological economics, and policy/social dimensions of resource management. The program meets the commonality requirement as stipulated by the University.

Please note that REM 698 – Field Resource Management Workshop, is a three-day intensive field trip at the start of the program for both thesis and course-based students. REM 801 – Principles of Research Methods, is spread out over the first two terms, with a core deliverable of a research design proposal at the end of the second term.

Also attached: 1) the new course form for the MRM thesis; and 2) revised PhD thesis course to match credits (so that the MRM thesis, optically, does not carry more credits).

We would appreciate if you could facilitate review and vote by the FENV GSC in time to meet the SGSC December 14th materials deadline.

Our thanks to Krista Gerlich-Fitzgerald and the team at Grad Studies for their helpful consultations throughout the development process.

Best,
Sean Markey
Graduate Chair
School of Resource and Environmental Management
Resource and Environmental Management

MASTER OF RESOURCE MANAGEMENT

Students who successfully complete this program will be awarded the degree of master of resource management.

Admission Requirements

Refer to the graduate general regulations for admission requirements. Contact the School of Resource and Environmental Management directly for more information (reminfo@sfu.ca). Those with degree qualifications in fields not directly related but with extensive experience in resource management are encouraged to apply.

Applicants will vary in their preparation for the various disciplines in the school. Therefore, admission to the school might be conditional upon the completion of certain undergraduate courses. Detailed application information can be found on the department's website: http://www.sfu.ca/rem/prospective-students/apply.html.

Application deadline: January 25.

Program Requirements

Students complete an introductory field course [REM 698], six additional required courses, and a major written research project [REM 699]. The research project must be presented and defended at an oral defense. In addition, students are required to complete four graduate elective courses. A minimum of 61 units is required, consisting of 43 required units and 18 elective units. In exceptional cases, if a student provides evidence of advanced education that is equivalent to one of the required courses, a waiver may be granted for that course, thereby reducing the number of required courses by one.

Prerequisite Courses

Students must be familiar with the material covered in an undergraduate course in parametric and nonparametric statistics.

Required Courses

Students complete a total of 43 units, including all of

REM 601 - Social Science of Natural Resources Management (5)
REM 611 - Population and Community Ecology (5)
REM 621 - Ecological Economics (5)
REM 631 - Earth Systems and Global Change in Environmental Management (5)
REM 698 - Field Resource Management Workshop (3)
REM 699 - Research Project (10)
REM 801 - Principles of Research Methods (5)

and one of

REM 642 - Sustainable Community Planning and Regional Development (5)
REM 644 - Public Policy Analysis and Administration (5)

Elective Courses

Students choose four graduate courses (18 units minimum) as electives to support and complement their particular research interests. Students may, in consultation with their senior supervisor, select REM courses and/or other graduate courses.

Academic Requirements within the Graduate General Regulations

All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
Resource and Environmental Management

MASTER OF RESOURCE MANAGEMENT

Description of Program
The master of resource management program is designed for recent graduates from a range of disciplines and for individuals with experience in private organizations or public agencies dealing with natural resources and the environment.

Admission Requirements
Applicants must satisfy the University admission requirements as stated in Graduate General Regulations 1.3 in the SFU Calendar. Contact the School of Resource and Environmental Management directly for more information (reminfo@sfu.ca). Those with degree qualifications in fields not directly related but with extensive experience in resource management are encouraged to apply.

Applicants will vary in their preparation for the various disciplines in the school. Therefore, admission to the school may be conditional upon the completion of certain undergraduate courses. Students must be familiar with the material covered in an undergraduate course in parametric and non-parametric statistics.

Detailed application information, including the application deadline, can be found on the department’s website: http://www.rem.sfu.ca/prospective-students/apply-to-rem/.

Program Requirements
Program options consist of either 11 required courses and a research project (course-based stream) for a minimum of 57 units, or 7 courses and a thesis (thesis-based stream) for a minimum of 47 units. Both the project and thesis require high quality research. The thesis stream is more research intensive, producing a final thesis document that is larger in scope than a project and that makes a distinct original contribution to knowledge.

Course-based Stream
Students complete the following courses*
REM 601 - Social Science of Natural Resources Management (5)
REM 611 - Population and Community Ecology (5)
REM 621 - Ecological Economics (5)
REM 631 - Earth Systems and Global Change in Environmental Management (5)
REM 698 - Field Resource Management Workshop (3)
REM 801 - Principles of Research Methods (5)

and one of
REM 642 - Sustainable Community Planning and Regional Development (5)
REM 644 - Public Policy Analysis and Administration (5)

and four graduate elective courses (18 units minimum chosen in consultation with the student’s senior supervisor)

and a research project
REM 699 - Research Project (6)
Thesis Stream
Students complete one of
REM 611 - Population and Community Ecology (5)
REM 631 - Earth Systems and Global Change in Environmental Management (5)

and one of
REM 642 - Sustainable Community Planning and Regional Development (5)
REM 644 - Public Policy Analysis and Administration (5)
REM 601 - Social Science of Natural Resources Management (5)

and all of the following*
REM 621 - Ecological Economics (5)
REM 801 – Principles of Research Methods (5)
REM 698 - Field Resource Management Workshop (3)

and two graduate elective courses (6 units minimum chosen in consultation with the student's senior supervisor)

and a thesis
REM 697 - MRM Thesis (18)

*In exceptional cases, if a student provides evidence of advanced education that is equivalent to one of the required courses, a waiver may be granted for that course.

Program Length
Students are expected to complete the program in six terms. Note that co-op placement(s) may extend terms to completion.

Other Information
Both the thesis and the research project must be submitted to the library upon completion.

REM's Cooperative Education (Co-op) Program provides opportunities for graduate students to work in governmental or private resource management organizations to gain professional experience. REM students remain in strong demand across several employment sectors, but most placements continue to be within the Federal and Provincial governments. Participation in the Co-op program is optional.

Academic Requirements within the Graduate General Regulations
All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
MEMORANDUM

ATTENTION: Senate Graduate Studies Committee

FROM: Timothy Beischlag, Director, Graduate Programs

RE: HSCI Graduate Course Changes

DATE: November 24, 2017

PAGES: 1/3

The attached course changes have been approved by the Faculty of Health Sciences and are forwarded to the Senate Graduate Studies Committee for approval. These curriculum items should be effective Fall 2018. Please include them on the next SGSC agenda.

1. Temporary withdrawal: HSCI 838

2. Reformatted Calendar Entry and Program Change to remove HSCI 838 as a requirement
   Health Sciences, Master of Public Health

3. Reformatted Calendar Entries
   Health Sciences, Master of Science
   Health sciences, Doctor of Philosophy

Timothy Beischlag
Director, Graduate Programs
Health Sciences
Simon Fraser University Calendar | Spring 2018

Health Sciences

MASTER OF PUBLIC HEALTH

A master of public health (MPH) program, which focuses on population and public health, is offered with practice-based study which integrates core public health knowledge with the attainment of public health practitioner skills.

Admission Requirements

Applicants who are recent graduates will have a baccalaureate degree in a discipline relevant to population and public health including the social and behavioral sciences, life sciences, and/or the quantitative sciences. A 3.3 cumulative grade point average is normally required. Applicants with substantial practitioner experience in health or a related field will be evaluated in part on their academic credentials and career accomplishments.

Applicants may receive conditional admission subject to satisfactory completion of additional specified courses and a statistics university undergraduate course or its equivalent.

Applicants should indicate their preferred MPH concentration, and must demonstrate experience, interest, and commitment to their chosen area of study. Global health concentration applicants should have some international experience.

Factors influencing MPH program admission include the availability of faculty with expertise in the desired area of study, enrolment space, and the applicant's specific preparation.

Meeting program application requirements does not guarantee program admission.

Students are admitted annually in the fall term only. All applicants must meet the application deadline which is normally set for the beginning of February. Only complete applications are considered. To apply on-line and pay the application fee, visit www.sfu.ca/dean-gradstudies/future.html. For information about how to apply, visit the Faculty of Health Sciences' website at www.fhs.sfu.ca/graduate-programs.

Program Requirements

Students complete a minimum of 46 units of course work, which includes a 13 week practicum completed over an academic term, and submission of a master's project. With senior supervisor and graduate program director approval, students may submit a thesis in lieu of a master's project, but all students complete a practicum. Students choosing to write a thesis will complete a minimum of 49 units.
Students who choose to take longer to complete their program should plan a minimum of two courses per term. Note that graduate general regulations govern the permitted time to complete a master's degree.

**Core Course Requirements**

The following 25 units of core courses will meet the core learning objectives and core competencies developed in consultation with faculty, students, community stakeholders, and potential future employers. These courses are required, no matter which concentration is chosen.

Students complete all of

- HSCI 801 - Biostatistics for Population Health Practice I (4)
- HSCI 802 - Principles of Epidemiology for Public Health (4)
- HSCI 803 - Qualitative and Survey Research Methods (4)
- HSCI 845 - Environmental and Occupational Health (3)
- HSCI 880 - Practicum (3)
- HSCI 897 - MPH Project (3)
- HSCI 900 - Core Concepts and Practice for Public Health I (2) *
- HSCI 901 - Core Concepts and Practice for Public Health II (2) *

* normally completed in the first year.

**Project Option**

Students who choose to complete a project (instead of a thesis) will complete the following course.

- HSCI 897 - MPH Project (3)

In this course students will develop the final project with their supervisors in the term following practicum completion.

**Thesis Option**

Students who choose to complete a thesis (instead of a project) will complete the following course.

- HSCI 898 - MPH Thesis (6)

Approval of the supervisor and the graduate program director is required, to ensure that Faculty of Health Sciences thesis guidelines are met, including the development and defence of a thesis proposal. Students will continue to enrol in this course until the thesis is completed and successfully defended, as described in Graduate General Regulations 1.9 and 1.10.

Note that thesis students will complete 49 units.

**Practicum**

All students complete a practicum, which may be undertaken during any term, by completing

- HSCI 880 - Practicum (3)

Students will consult with their senior supervisor concerning all courses to be completed before the practicum which will include, at minimum, HSCI 900 and 901, and four courses from the following: 801, 802, 803, 845, 855, 830, 821. Under special circumstances, students may request written permission from the director, public health practice, and the senior supervisor to substitute one of these, or to embark on the practicum prior to completion of these courses.
Students normally complete their practicum during the summer term of their first year, but it may be completed later provided that prerequisites are met. Either way, these options allow ample time to complete core course requirements before undertaking the practicum.

Public Health Practice Seminars

In their first year, students register in

HSCI 900 - Core Concepts and Practice for Public Health I (2)
HSCI 901 - Core Concepts and Practice for Public Health II (2)

Seminars include practicum preparation workshops.

Concentration Requirements

In addition to the requirements stated above, students choose one of the following concentrations.

Environmental and Occupational Health Concentration

The objective of this concentration is to train practitioners for practice, research, and leadership positions in environmental health. Environmental health sciences is a complex, multifaceted field that is dedicated both to protecting communities and workers from environmental factors that adversely impact human health, and to maintaining the ecological balances essential to long-term human health and environmental quality. Environmental health is one of the largest areas of public health comprising a large percentage of public health practitioners.

A number of our faculty have interests in environmental and occupational health.

In addition to the core requirements, students must complete the following courses.

All of

HSCI 847 - Risk Assessment and Communication for Human Health (3)
HSCI 849 - Environmental and Occupational Epidemiology (3)

and one of

HSCI 776 - Seminar in Molecular Basis of Drug Action and Environmental Exposure (3)
HSCI 846 - Environmental Health Exposure Assessment and Analysis (3)

and one of

HSCI 824 - Comparative Health Care Systems (3)
HSCI 827 - Analysis of the Canadian Health Care Delivery System (3)

and one of

HSCI 835 - Social and Behavioural Contexts of Health and Disease (3)
HSCI 855 - Health Promotion in Practice: The Canadian Context (3)

and two electives.

The following two courses are highly recommended electives; however, see link on the FHS website with a longer list of electives that may be chosen in consultation with your senior supervisor.

HSCI 804 - Biostatistics for Population Health Practice II (3)
HSCI 850 - Air Pollution and Human Health (3)

With the approval of the senior supervisor and consent of the Graduate Program Director, a student may substitute electives from this list and one elective drawn from other institutions. See FHS website.

**Global Health Concentration**

In addition to the core courses listed above, students who choose this concentration will complete all of

- HSCI 821 - Introduction to Global Health (3)
- HSCI 822 - Global Health Governance (3) or HSCI 870 - Global Health and International Affairs (3)
- HSCI 824 - Comparative Health Care Systems (3)
- HSCI 830 - Health Promotion in Partnership: Catalyzing Change (3)

and a minimum of one methods or skills course chosen from

- HSCI 804 - Biostatistics for Population Health Practice II (3)
- HSCI 805 - Intermediate Epidemiologic Methods (3)
- HSCI 825 - Advocacy and Communication (3)
- HSCI 826 - Program Planning and Evaluation (3)

or a course providing appropriate methods and skills, chosen from HSCI courses, or from another department or faculty, with the permission of the senior supervisor and the graduate program director

and two additional elective courses chosen from HSCI courses or from relevant courses in other faculties and departments, with permission of the senior supervisor and course instructor.

**Population Health Concentration**

In addition to the core courses listed above, students who choose this concentration will complete all of

- HSCI 827 - Analysis of the Canadian Health Care Delivery System (3)
- HSCI 835 - Social and Behavioural Contexts of Health and Disease (3)
- HSCI 855 - Health Promotion in Practice: The Canadian Context (3)

and a minimum of one methods or skills course chosen from

- HSCI 804 - Biostatistics for Population Health Practice II (3)
- HSCI 805 - Intermediate Epidemiologic Methods (3)
- HSCI 825 - Advocacy and Communication (3)
- HSCI 826 - Program Planning and Evaluation (3)

or a course providing appropriate methods or skills, chosen from HSCI courses or from another department or faculty, with permission of the senior supervisor and the graduate program director

and three additional elective courses chosen from HSCI courses or from relevant courses in other faculties and departments, with permission of the senior supervisor and course instructor.

**Social Inequities and Health Concentration**

The importance of reducing health inequities has emerged as an imperative for health scholars, policymakers and practitioners both within Canada and globally. Increasingly, health inequities are being understood within a conceptual framework that foregrounds the role of structural factors and accounts for intersecting axes of oppression and privilege. Despite a substantial evidence base documenting social inequities in health, there are major gaps in our understanding of the pathways and mechanisms whereby health
inequities are produced. Thus, there is limited information on which to base development of effective prevention and intervention policies that will reduce these inequities.

This concentration's goal is to prepare MPH students for critical and reflexive research and practice that addresses health inequities related to poverty, racism, colonialism, sexism and other forms of structural violence. Upon completion of the concentration, learners will have a commitment and capacity to advance theory, research, and practice that explains why systemic social inequities persist and how best to reduce their effects on population health.

In addition to the core courses listed above, students who choose this concentration will complete all of

HSCI 807 - Researching Health Inequities (3)
HSCI 835 - Social and Behavioural Contexts of Health and Disease (3)
HSCI 838 - Theorizing Social Inequities and Health (3)
HSCI 839 - Strategies for Reducing Health Inequities (3)

and one of

HSCI 824 - Comparative Health Care Systems (3)
HSCI 827 - Analysis of the Canadian Health Care Delivery System (3)

and one of

HSCI 822 - Global Health Governance (3)
HSCI 823 - Health, Gender and Development (3)
HSCI 829 - Health Policy Making in a Global Context (3)

With the approval of their senior supervisor and consent of the graduate program director, a student may substitute one course from this list with an HSCI elective, or from another department or faculty.

and one additional elective chosen from an HSCI course or from relevant courses in other faculties and departments, with permission of the senior supervisor and the director of graduate programs.

NOTE: Students admitted concurrently to a bachelor's degree program and a master's degree program within the Faculty of Health Sciences may apply a maximum of 10 graduate course units, taken while completing the bachelor's degree, towards the requirements of the master's degree. These graduate courses must be passed with a grade of B (3.0) or better in order to be used towards the requirements of the master's degree. For more information go to: http://www.sfu.ca/dean-gradstudies/future/academicprograms/ConcurrentAdmission.html.

Academic Requirements within the Graduate General Regulations

All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
Health Sciences
MASTER OF PUBLIC HEALTH

Description of Program

The Masters of Public Health (MPH) program is a practice-based graduate degree that trains students in a breadth of research and practice intended to improve population health. This program is designed to meet core public health competencies - what the profession considers to be the essential knowledge and skills required for the successful application of public health.

Admission Requirements

Applicants must satisfy the University admission requirements as stated in Graduate General Regulations 1.3 and the requirements on the Faculty of Health Sciences website.

See Graduate General Regulation 1.3.4 iii transfer from master's to PhD, which is possible for exceptional students in the first 6 semesters of their master’s.

Program Requirements

This program consists of course work, a minimum 11 week practicum and a project for a total of 46 credit hours, or with the approval of the senior supervisor and the director, students may choose a thesis in lieu of a master's project, for a total of 50 credit hours.

Project Option
Students must complete all of
HSCI 801 - Biostatistics for Population Health Practice I (4)
HSCI 802 - Principles of Epidemiology for Public Health (4)
HSCI 803 - Qualitative and Survey Research Methods (4)
HSCI 845 - Environmental and Occupational Health (3)
HSCI 900 - Core Concepts and Practice for Public Health I (2)
HSCI 901 - Core Concepts and Practice for Public Health II (2)

and requirements from one of the concentrations

and a practicum
HSCI 880 - Practicum (3)

and a project
HSCI 897 - MPH Project (3)

Thesis Option
Students must complete all of
HSCI 801 - Biostatistics for Population Health Practice I (4)
HSCI 802 - Principles of Epidemiology for Public Health (4)
HSCI 803 - Qualitative and Survey Research Methods (4)
HSCI 845 - Environmental and Occupational Health (3)
HSCI 900 - Core Concepts and Practice for Public Health I (2)
HSCI 901 - Core Concepts and Practice for Public Health II (2)

and requirements from one of the concentrations

and a practicum
HSCI 880 - Practicum (3)

and a thesis
HSCI 898 - MPH Thesis (6)

Concentrations

Environmental and Occupational Health Concentration
In addition to the core requirements, students who choose this concentration must complete all of
HSCI 847 - Risk Assessment and Communication for Human Health (3)
HSCI 849 - Environmental and Occupational Epidemiology (3)

and one of
HSCI 776 - Seminar in Molecular Basis of Drug Action and Environmental Exposure (3)
HSCI 846 - Environmental Health Exposure Assessment and Analysis (3)

and one of
HSCI 824 - Comparative Health Care Systems (3)
HSCI 827 - Analysis of the Canadian Health Care Delivery System (3)

and one of
HSCI 835 - Social and Behavioural Contexts of Health and Disease (3)
HSCI 855 - Health Promotion in Practice: The Canadian Context (3)
HSCI 842: Indigenous Health in Canada (3)

and two elective graduate HSCI courses

Global Health Concentration
In addition to the core requirements, students who choose this concentration must complete all of
HSCI 821 - Introduction to Global Health (3)
HSCI 822 - Global Health Governance (3)  HSCI 824 - Comparative Health Care Systems (3)
HSCI 830 - Health Promotion in Partnership: Catalyzing Change (3)

and one of
HSCI 804 - Biostatistics for Population Health Practice II (3)
HSCI 805 - Intermediate Epidemiologic Methods (3)
HSCI 825 - Advocacy and Communication (3)
HSCI 826 - Program Planning and Evaluation (3)

and two of
HSCI 808: Economics of Health and Health Care (3)
HSCI 823: Health, Gender and Development (3)
HSCI 825: Advocacy and Communication (3)
HSCI 826: Program Planning and Evaluation (3)
REVISIONED
CALENDAR ENTRY

HSCI 829: Health Policy-making in a Global Context (3)
HSCI 842: Indigenous Health in Canada (3)
HSCI 855: Health Promotion in Practice: The Canadian Context (3)

Population Health Concentration
In addition to the core requirements, students who choose this concentration must complete all of
HSCI 827 - Analysis of the Canadian Health Care Delivery System (3)
HSCI 835 - Social and Behavioural Contexts of Health and Disease (3)
HSCI 855 - Health Promotion in Practice: The Canadian Context (3)

and one of
HSCI 804 - Biostatistics for Population Health Practice II (3)
HSCI 805 - Intermediate Epidemiologic Methods (3)
HSCI 825 - Advocacy and Communication (3)
HSCI 826 - Program Planning and Evaluation (3)

and three elective graduate HSCI courses

Social Inequities and Health Concentration
In addition to the core requirements, students who choose this concentration must complete all of
HSCI 807 - Researching Health Inequities (3)
HSCI 835 - Social and Behavioural Contexts of Health and Disease (3)
HSCI 839 - Strategies for Reducing Health Inequities (3)

and one of
HSCI 824 - Comparative Health Care Systems (3)
HSCI 827 - Analysis of the Canadian Health Care Delivery System (3)

and one of
HSCI 822 - Globalization and Health (3)
HSCI 823 - Health, Gender and Development (3)
HSCI 829 - Health Policy Making in a Global Context (3)
HSCI 842: Indigenous Health in Canada (3)

and one elective graduate HSCI course

Note: SFU students enrolled in the Accelerated Master's within Health Sciences may apply a maximum of 10
graduate course units, taken while completing the bachelor's degree, towards the upper division
undergraduate electives of the bachelor's program and the requirements of the master's degree. For more
information go to: http://www.sfu.ca/dean-gradstudies/future/academicprograms/AcceleratedMasters.html.

Program Length
Students are expected to complete the program requirements in six terms.

Academic Requirements within the Graduate General Regulations
All graduate students must satisfy the academic requirements that are specified in the Graduate General
Regulations, as well as the specific requirements for the program in which they are enrolled.
Health Sciences

MASTER OF SCIENCE

This master of science (MSc) program prepares graduates for research careers in one of the signature areas that either have been developed or are currently under development within the faculty including: global health; environmental and occupational health, toxicology; maternal and child health; epidemiology and biostatistics; health promotion and disease prevention; infectious diseases; chronic diseases and aging; mental health and substance use; social inequities and health; adolescent and child development; reproductive health; and health policy. The available courses and directed research experiences available will cover health issues from the level of cells, organisms, systems, communities and populations, encompassing and transcending strictly individual or clinical perspectives.

The MSc curriculum is flexible by design. Students, in consultation with faculty advisors, create a curriculum plan that will best help them meet their research and career goals. A disciplinary-specific application of the scientific method shall be common to all MSc curriculum plans.

Formal academic instruction is available in regularly taught courses within the faculty as well as in other Simon Fraser University faculties and departments, and other universities in Western Canada through the Western Deans' Agreement. In addition, directed studies and directed research courses may be available in specific areas.

Admission Requirements

Applicants to the MSc program who are recent graduates should have completed a baccalaureate degree in a discipline relevant to their area(s) of interest in the health sciences. Such disciplines include the social and behavioral sciences, humanities, life sciences and/or the quantitative sciences.

Applicants must satisfy all University admission requirements as outlined in Simon Fraser University's Calendar under graduate general regulations 1.3.3. A minimum cumulative grade point average of at least 3.3 on grading scales similar to Simon Fraser University's is required. Applicants must submit evidence, usually references from qualified referees, of their ability to undertake advanced research in their area of interest. Applicants should explain in their applications how their educational, research and/or career experiences have prepared them for their selected areas of study and research in the program.

Applicants from countries where English is not the primary language must provide test scores from TWE, TOEFL, or IELTS examinations taken within two years prior to applying to the MSc program. Minimum scores are indicated in graduate general regulation 1.3.12.
Factors influencing admission to the MSc program include an assessment of whether the student’s educational and career interests are complementary to the research strengths of the faculty, enrolment space, and the student’s specific preparation.

Before admission can be finalized, a Faculty of Health Sciences faculty member who will serve as a senior supervisory must be identified. Note that while applicants may apply to the program without identifying a senior supervisor, a final decision to admit depends on the commitment by a faculty member to serve in this capacity.

Admission is competitive. Meeting these minimum standards does not guarantee admission to the program.

To apply and pay the application fee online, consult the graduate studies website at http://www.sfu.ca/gradstudents/applicants/index.html. For specific Faculty of Health Sciences information, visit http://www.sfu.ca/fhs/future-students/graduate.html.

**Applying from the Faculty of Health Sciences Master of Public Health Program to the Master of Science Program**

Students in the Faculty of Health Sciences Master of Public Health (MPH) program may apply to the MSc program. MPH students must submit all required supporting documents to be considered for the MSc program by the advertised deadlines. Meeting program application requirements does not guarantee admission to the program. The FHS graduate studies committee in consultation with the student’s supervisor will determine credit for course work completed while in the MPH program.

**Program Requirements**

The program is a research degree that is designed to incorporate a focus on one or more of the thematic areas of research expertise within the Faculty of Health Sciences, and introduces students to interdisciplinary concepts in health sciences research. The minimum requirements for an MSc degree in FHS are

- completion of 12 units of graduate course work
- writing and defence of an MSc thesis proposal
- writing and defence of an MSc thesis

By the end of their second term in the MSc program, and in consultation with their senior supervisor, students must have formed and met with their supervisory committee, whose composition must be approved by the FHS graduate studies committee in accordance with the Simon Fraser University graduate general regulations. The supervisory committee will normally consist of the senior supervisor and a minimum of two additional faculty members whose expertise will complement the student’s research and program goals. The role of the supervisory committee is to oversee student curricular planning and progress in the program and to assess student performance on the thesis proposal, the thesis research, and the thesis defence.

Students are required to submit and present annual progress reports to their supervisory committee. In addition to an evaluation of the student’s progress by the supervisory committee, these reports should provide a summary of courses taken and grades achieved, planned course work and research-related activities (e.g. conference attendance), financial support and self-evaluation done by the student of his/her progress.

MSc students must maintain a minimum grade point average of 3.0 during their time in the program.

**NOTE:** Students admitted concurrently to a bachelor’s degree program and a master’s degree program within the Faculty of Health Sciences may apply a maximum of 10 graduate course units, taken while completing the bachelor’s degree, towards the requirements of the master’s degree. These graduate courses must be passed with a grade of B (3.0) or better in order to be used towards the requirements of the master’s degree. For more information go to: http://www.sfu.ca/dean-gradstudies/future/academicprograms/ConcurrentAdmission.html.
MSc Course Work

The minimum requirements for all students are 30 units of graduate course work which consists of a minimum of

one core seminar (three units)

three core colloquium courses (each one unit, totalling three units)

two elective courses (equalling a minimum of six units)

a thesis proposal (six units)

a master’s thesis (12 units)

CORE COURSES

Students complete all of the following. However, students who are accepted into the Faculty of Health Sciences PhD program are not required to repeat these courses provided these courses were completed with a minimum grade of A- or higher in each.

HSCI 902 - Interdisciplinary Seminar in Health Sciences I (3)
HSCI 903 - Interdisciplinary Seminar in Health Sciences II (3)

ELECTIVE COURSES

Elective course work will be determined by the student in consultation with his/her senior supervisor and the supervisory committee. Elective courses may be from any of the graduate course offerings at Simon Fraser University with the approval of the offering units.

A student may be advised to complete additional course work by his/her senior supervisor in consultation with the supervisory committee commensurate with the research interests of the student and within the scope of the student’s curricular focus. Additional courses may be completed at Simon Fraser University or, in select cases, at other universities that participate in the Western Dean’s Agreement.

All graduate students are expected to regularly attend the FHS research seminar series (HSCI 900) each fall and spring term.

Transferring to the Faculty of Health Sciences PhD Program

Students in the MSc program may apply to transfer to the PhD program. To do so, they must demonstrate their ability to carry out innovative, independent and original PhD level research in that field, have obtained high academic standing in previous university work, and have the support of their senior supervisor. All university regulations governing transfers must be met (graduate general regulation 1.3.4). Transfers will normally only be considered in the second through fifth terms after enrolment in the MSc program. Transfer applications must be approved by the student’s supervisory committee, the FHS graduate studies committee, and the dean of graduate studies. Students transferring from the MSc program will be eligible to earn only the PhD degree. Students will not be eligible to transfer to the PhD program beyond six terms of full-time equivalent course work in the MSc program.

Research

A major part of the MSc program will be devoted to original research as relevant within the context of the health science discipline the student is pursuing. The results of this research work are to be presented in the form of a thesis. The thesis shall be submitted and defended in accordance with graduate general regulations.

Anticipated Completion Time
The anticipated completion time of all program requirements for students enrolled in the FHS MSc program is two to three years (six to nine terms) from initial enrolment, depending on the research discipline and progress in the program. In accordance with the graduate general regulations 1.12.2, the maximum allowable time for completion of MSc requirements is four years (12 terms) of full-time equivalent enrolment. In addition, all requirements of the MSc degree must be completed within six calendar years of initial enrolment.

**MSc Thesis Requirement**

The MSc is a research degree in which the main component is a thesis that addresses a research problem relevant to health sciences. Upon initiating their thesis research, MSc students enrol in HSCI 887 and are continuously enrolled in this course until the thesis is completed and successfully defended in accordance with graduate general regulations 1.9 and 1.10.

Before commencing research leading to the MSc thesis, all students must prepare and successfully defend a thesis proposal. Students must also obtain, as necessary, relevant ethics, biosafety, and animal care and use approvals.

**Thesis Proposal**

The student will prepare a written research proposal prior to commencing research leading to the MSc thesis. Upon initiating preparation of the proposal, MSc students enrol in HSCI 886. The proposal shall be organized and evaluated in accordance to policies and procedures established by the FHS graduate studies committee. In general, the proposal will integrate a review of the relevant research literature and describe research methodology appropriate to the principal research question(s), expected results and their significance.

MSc students will normally submit their thesis proposal by the end of their first calendar year in the program to their supervisory committee. The student will then orally present and defend the proposal before their committee. The proposal and oral defence will be graded on a pass/fail basis. Failure of the written proposal or oral defense will be considered unsatisfactory progress, and will trigger review by the FHS graduate studies committee as outlined in graduate general regulation 1.8.2.

**Thesis Defence**

A written thesis is based on the candidate’s original contribution to research in the field of his/her expertise, and is the final requirement for completion of the MSc program. The thesis will typically include a background/introduction section, research materials and/or methods, results and analyses, and discussion. Students must note in the thesis that the appropriate ethics, biosafety, and animal care and use approvals were obtained prior to conducting their research work.

All MSc candidates must pass the formal thesis defence which is conducted in accordance with graduate general regulations 1.9.2 and 1.10.1. The candidate will be recommended for the award of an MSc degree in health sciences upon successful defence of the thesis.

**Academic Requirements within the Graduate General Regulations**

All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
Health Sciences
MASTER OF SCIENCE

Description of Program
This master of science (MSc) in Health Sciences program prepares graduates for research careers in one of the signature areas within the faculty including: global health; environmental and occupational health, and toxicology; maternal and child health; epidemiology and biostatistics; health promotion and disease prevention; infectious diseases; chronic diseases and aging; mental health and substance use; social inequities and health; adolescent and child development; reproductive health; and health policy. The available courses and directed research experiences available will cover health issues from the level of cells, organisms, systems, communities and populations, encompassing and transcending strictly individual or clinical perspectives.

The MSc curriculum is flexible by design. Students, in consultation with faculty advisors, create a curriculum plan that will best help them meet their research and career goals. A disciplinary-specific application of the scientific method shall be common to all MSc curriculum plans.

Admission Requirements
Applicants must satisfy the University admission requirements as stated in Graduate General Regulations 1.3 and the requirements on the Faculty of Health Sciences website.

See Graduate General Regulation 1.3.4 iii transfer from master's to PhD, which is possible for exceptional students in the first 6 semesters of their master's.

Supervision
An FHS faculty member who has agreed to serve as the applicant's senior supervisor must be identified prior to submitting an application for admission. Applicants who do not have a confirmed senior supervisor at the application deadline will not be considered.

Program Requirements
This program consists of course work, a thesis proposal, and a thesis for a minimum of 30 units.

Students must complete all of
HSCI 902 - Interdisciplinary Seminar in Health Sciences I (3)
HSCI 903 - Interdisciplinary Seminar in Health Sciences II (3)

and a minimum of six elective graduate units approved by the Senior Supervisor

and a thesis proposal
HSCI 886 - MSc Thesis Proposal (6)

and a thesis
HSCI 887 - MSc Thesis (12)
Course Work
A student may be advised to complete additional course work by his/her senior supervisor in consultation with the supervisory committee commensurate with the research interests of the student and within the scope of the student’s curricular focus.

Note: SFU students enrolled in the Accelerated Master’s within Health Sciences may apply a maximum of 10 graduate course units, taken while completing the bachelor’s degree, towards the upper division undergraduate electives of the bachelor’s program and the requirements of the master’s degree. For more information go to: http://www.sfu.ca/dean-gradstudies/future/academicprograms/AcceleratedMasters.html.

Program Length
Students are expected to complete the program requirements in six to nine terms (two to three years) from initial enrolment, depending on the research discipline and progress in the program.

Academic Requirements within the Graduate General Regulations
All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
Please note:

To view the Fall 2017 Academic Calendar go to http://www.sfu.ca/students/calendar/2017/fall.html

Health Sciences
Simon Fraser University Calendar | Spring 2018

Health Sciences

DOCTOR OF PHILOSOPHY

This doctor of philosophy (PhD) program trains students in advanced research in health sciences, and provides them with the skills, content area expertise, and analytical and critical thinking capabilities required to pursue original research relevant to health. Consistent with the mandate and objectives of the Faculty of Health Sciences (FHS) mission, the program will introduce students to interdisciplinary approaches to research that will encourage them to develop cross-disciplinary research skills.

Areas of disciplinary emphasis in the faculty include: social science, epidemiology, biostatistics, policy analysis, ethics and laboratory-based biomedical science. Research areas in the faculty are interdisciplinary and include: global health; environmental health and toxicology; maternal and child health, epidemiology and disease prevention; chronic and infectious diseases; population and public health; mental health and addiction; social inequities and health outcomes; adolescent and child development; reproductive health; and health policy.

Admission Requirements

Applicants will normally have previous training in a discipline relevant to their area(s) of interest in health sciences. Admission will depend on the availability of faculty to supervise the student. FHS requires applicants to identify from the faculty a senior supervisor who will agree to supervise the student, if accepted into the program.

To qualify for admission, applicants must satisfy all University admission requirements as outlined in the graduate general regulations, which include the following.

- a master’s degree from a recognized university, or the equivalent, or
- a bachelor’s degree with a cumulative grade point average of at least 3.5 (on a 4.33 scale) from a recognized university, or the equivalent, or
- completion of at least 75% of the course work units required for the relevant department’s master’s program with a cumulative grade point average of at least 3.5. All graduate courses, whether completed at this university or another, shall be considered in the calculation.

In addition to the above, evidence is submitted showing that the applicant is capable of undertaking substantial original research. Normally, such capability will be judged from letters of reference from qualified referees, and the completion of a master’s thesis, projects, published papers, or other scholarly work.
In addition, international students from countries where English is not the primary language must provide test scores from the Test of Written English (TWE), the Test of English as a Foreign Language (TOEFL), or International English Language Testing System (IELTS) examinations. Minimum scores are indicated in graduate general regulation 1.3.12.

Admission is competitive. Meeting these minimum standards does not guarantee admission to the program.

Application

All applicants, except those transferring from a Faculty of Health Sciences master of science program or a master of public health program (for these, see below) must submit the following documents.

- all post-secondary transcripts
- a short curriculum vitae providing evidence of scholarships and awards, academic performance, publications, and relevant research and work experience
- a statement of intent describing how the program fits the applicant's research interests and career objectives. This statement must articulate the student’s background and expertise, and will ideally evidence commitment to interdisciplinary scholarship.
- three referees from academics/researchers who have first-hand knowledge of the applicant's research capabilities and academic training
- applicants whose first language is not English, and whose previous education has been conducted in another language, are required to submit official results of TOEFL and TWE or IELTS exams that were taken in the last two years
- students who have completed their undergraduate degree at an academic institution outside of North America may wish to supply the results of the graduate record examination (GRE) that was taken within five years of the application date

Before admission can be finalized, a senior supervisor must be identified, and that individual must complete a supervisory committee form and submit a letter attesting to a willingness to act in this capacity. This letter must also indicate funding commitments, or if funding is not available, a statement explaining how the student will be funded in their program of study, and where relevant, commitments to obtaining that funding. Note that while applicants may apply to the program without identifying a senior supervisor, a final decision to admit depends on the commitment by a faculty member to serve in this capacity.

Student Supervision

By the end of the first term, and in consultation with the senior supervisor, students must have formed and met with their supervisory committee whose composition must be approved by the Faculty of Health Sciences graduate studies committee in accordance with Simon Fraser University policy.

The supervisory committee will comprise the senior supervisor and a minimum of two additional faculty members whose expertise will complement the student's research and program goals. The role of the supervisory committee is to oversee student curricular planning and progress, and to assess student performance on the comprehensive examination, the thesis proposal and defence, the thesis research and the thesis defence.

At least once each year, the supervisory committee will report on the student’s progress and plans for the upcoming year, including course work. The annual report will be submitted for approval by the graduate studies committee with a copy to the student. Students are required to demonstrate adequate progress toward the degree as judged by their committee, and meet the minimum standards as described in graduate general regulation 1.5.4.

Transferring to the PhD Program

Master of science (MSc) or master of public health (MPH) students who show exceptional abilities may apply to transfer to the PhD program only if the student can demonstrate their ability to carry out innovative, independent and original PhD level research in that field, has obtained high academic standing in previous university work, and has the support of their master's supervisor. All University regulations governing transfers must be met (see graduate general regulation 1.3.4). Transfers are only permitted when
the student has been in the master's program for two but not more than five terms. Transfer applications must be approved by the student's supervisory committee, the FHS graduate studies committee, and the dean of graduate studies. Students transferring from the master's program will be eligible to earn only the PhD degree. Students will not be eligible to transfer to the PhD program beyond six terms of full-time equivalent course work in the MSc program.

Program Requirements

Students complete all of

HSCI 902 - Interdisciplinary Seminar in Health Sciences I (3)
HSCI 903 - Interdisciplinary Seminar in Health Sciences II (3)

Candidates will normally register in HSCI 902 followed by HSCI 903 during their first year of residence. Students who entered the PhD program from the Faculty of Health Sciences master's programs (MPH, MSc), and who have completed HSCI 902 and 903 need not repeat the courses, provided that they achieve a grade of A- or higher in each.

It is expected that most students will be required to complete additional course work or directed studies which will be determined by the student, together with the supervisory committee. A student's annual progress report includes the course work plans, and must be approved by the Faculty of Health Sciences graduate studies committee on an annual basis.

In addition to the required courses shown above, and as soon as the student commences preparation for the comprehensive exam, the student will register in

HSCI 983 - Comprehensive Exam and Thesis Proposal (6)

Once thesis research commences, the student enrolls in

HSCI 990 - Thesis Research (6)

When the student begins writing the thesis, they must register in

HSCI 998 - PhD Thesis Preparation and Defence (6)

Comprehensive Examination

The student must pass a comprehensive examination that consists of an oral defence of a major written paper, the topic of which will be determined by the supervisory committee. Details about the conduct of the exam are published in the PhD handbook and are found on the Faculty of Health Sciences website.

The comprehensive examination is normally completed by the end of the fourth term. There are four possible outcomes: pass, pass with minor comment and revision, pass with major revision and a requirement to rewrite and re-defend, and fail.

The comprehensive exam may be retaken only once. If a student fails the comprehensive exam, progress in the program is considered to be unsatisfactory and will trigger a review by the faculty's graduate studies committee as outlined in graduate general regulation 1.8.2, and the student will be required to withdraw from the program.

Doctoral Thesis Proposal

The candidate will prepare a written research proposal that integrates theory, current research, and methods in fields related to the selected research problem.

The proposal will be organized and evaluated in accordance with policies and procedures established by the faculty's graduate studies committee. Briefly, these policies specify that the proposal reviews the relevant research literature; reflects original work; and describes methodology that is appropriate to the principal research question(s).
PhD candidates will normally submit the thesis proposal in their second year. The proposal and oral defence will be graded on the same basis, with the same possible outcomes as the comprehensive exam.

In some cases, and depending on the judgment of the supervisory committee, the comprehensive examination and the thesis proposal presentation and defence may be combined into a single presentation and defence.

Thesis

Doctoral Thesis

A written thesis is based on the candidate's original contribution to research in the field of his/her expertise, and is the final requirement for the PhD program. The topic must be approved by the student's supervisory committee.

The thesis may take two forms: the traditional document which outlines the research undertaken, methods, results, and discussion; and the three-paper option in which the candidate submits three published or publishable papers bookended by introductory and concluding chapters.

Candidates must obtain human subject ethics approvals, relevant animal handling approvals, and/or bio-safety hazards approvals prior to conducting research, and must list approval numbers in the thesis.

Thesis Defence

All candidates must pass a formal thesis defence that is conducted in accordance with graduate general regulation 1.9.4. The candidate will be awarded the PhD degree upon the submission and successful defence of a doctoral thesis that describes the results of independent research.

Committee Composition

Normally the student's supervisory committee will conduct the doctoral comprehensive examination and thesis proposal defence.

In addition, for the doctoral thesis defence, and in consultation with the senior supervisor, the candidate will choose an internal examiner who is a member of faculty at the University, or a person otherwise suitably qualified who is not a member of the candidate's supervisory committee, and an external examiner who shall be specifically qualified in the field of the thesis and is not a member of faculty at the University, in accordance with graduate general regulation 1.9.3.

Residency Requirement

The candidate must be registered and in residence at Simon Fraser University for the minimum number of terms, as described in graduate general regulation 1.7.

The program requires a minimum of three years of full-time study, and the faculty will generally provide funding for only three years. Depending upon the student's prior training in the health sciences, and whether the student completed core courses while in Simon Fraser University's master of public health or master of science program, the length of study will generally vary from three to five years.

Academic Requirements within the Graduate General Regulations

All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
Health Sciences

DOCTOR OF PHILOSOPHY

Description of Program
This doctor of philosophy (PhD) in Health Sciences program trains students in advanced research in health sciences, and provides them with the skills, content area expertise, and analytical and critical thinking capabilities required to pursue original research relevant to health. Consistent with the mandate and objectives of the Faculty of Health Sciences (FHS) mission, the program will introduce students to interdisciplinary approaches to research that will encourage them to develop cross-disciplinary research skills.

Areas of disciplinary emphasis in the faculty include: social science, epidemiology, biostatistics, policy analysis, ethics, and laboratory-based biomedical science. Research areas in the faculty are interdisciplinary and include: global health; environmental health and toxicology; maternal and child health, epidemiology and disease prevention; chronic and infectious diseases; population and public health; mental health and addiction; social inequities and health outcomes; adolescent and child development; reproductive health; and health policy.

Admission Requirements
Applicants must satisfy the University admission requirements as stated in Graduate General Regulations 1.3 and the requirements on the Faculty of Health Sciences website.

See Graduate General Regulation 1.3.4 iii transfer from master's to PhD, which is possible for exceptional students in the first 6 semesters of their master's.

Supervision
An FHS faculty member who has agreed to serve as the applicant's senior supervisor must be identified prior to submitting an application for admission. Applicants who do not have a confirmed senior supervisor at the application deadline will not be considered.

Program Requirements
This program consists of course work, a comprehensive exam and thesis proposal, research, and a thesis for a minimum of 24 units.

Students must complete all of
HSCI 902 - Interdisciplinary Seminar in Health Sciences I (3)
HSCI 903 - Interdisciplinary Seminar in Health Sciences II (3)

and a comprehensive exam and thesis proposal
HSCI 983 - Comprehensive Exam and Thesis Proposal (6)

and thesis research
HSCI 990 - Thesis Research (6)

and a thesis
HSCI 998 - PhD Thesis Preparation and Defence (6)
Course Work
A student may be advised to complete additional course work by his/her senior supervisor in consultation with the supervisory committee commensurate with the research interests of the student and within the scope of the student's curricular focus.

Students who enter the PhD program from FHS MSc, and who receive an A- or higher in 902 or 903 do not need to repeat the courses.

Comprehensive Examination
The comprehensive examination may be retaken only once. If a student fails the comprehensive examination, progress in the program is considered unsatisfactory and will trigger a review by the faculty's graduate studies committee as outlined in Graduate General Regulation 1.8.2.

Doctoral Thesis Proposal
PhD candidates will normally submit the thesis proposal in their second year. The proposal and oral defence will be graded on the same basis, with the same possible outcomes as the comprehensive exam.

Program Length
Faculty of Health Sciences PhD candidates are expected to complete in 3-5 years.

Academic Requirements within the Graduate General Regulations
All graduate students must satisfy the academic requirements that are specified in the Graduate General Regulations, as well as the specific requirements for the program in which they are enrolled.
MEMORANDUM

ATTENTION: Senate
FROM: Jeff Derksen,
Chair of Senate Graduate Studies
Committee (SGSC)
RE: Graduate General Regulation (GGR) Revisions: GGR 1.3.5, GGR 1.3.5a, GGR 1.4,
GGR 1.9.1, GGR 1.9.3, GGR 1.9.4, GGR 1.9.5, GGR 1.9.6, GGR 1.10.2, GGR 1.10.3,
GGR 1.10.4, GGR 1.11.3

DATE: January 18, 2018

At its meeting of January 8, 2018, SGSC reviewed and approved the revisions to GGR 1.3.5, GGR
1.3.5a, GGR 1.4, GGR 1.9.1, GGR 1.9.3, GGR 1.9.4, GGR 1.9.5, GGR 1.9.6, GGR 1.10.2, GGR 1.10.3,
GGR 1.10.4, GGR 1.11.3 This gives rise to the following motions, effective Fall 2018.

Motion 1:
That Senate approve the revisions to GGR 1.3.5 (Admission Under Special Arrangements), GGR
1.3.5a (Cohort Special Arrangements), GGR 1.4 (Enrollment), 1.9.4 (Preparation for Examination
of Doctoral Thesis) and GGR 1.9.6 (Notification of Doctoral Thesis Examination)

Motion 2:
That Senate approve the revisions to GGR 1.9.1 (Preparation for Examination) and GGR 1.9.3
(Examining Committee for Doctoral Thesis)

Motion 3:
That Senate approve the revisions to GGR 1.9.5 (The Role of the External Examiner)

Motion 4:
That Senate approve the revisions to GGR 1.10.2 (Classification of the Thesis)

Motion 5:
That Senate approve the revisions to GGR 1.10.3 (Recommendation for the Award of the Degree)

Motion 6:
That Senate approve the revisions to GGR 1.10.4 (Submission of the Thesis to the Library)

Motion 7:
That Senate approve the revisions to GGR 1.11.3 (Postponement of Publication)
MEMORANDUM

ATTENTION: Senate Graduate Studies Committee

FROM: Jeff Derksen, Dean and Associate Provost of Graduate and Postdoctoral Studies

RE: Graduate General Regulations (GGR) Revisions.

DATE: December 14, 2017

The following GGRs have editorial revisions which are being recommended to be revised for clarity.

Motion 1:
That SGSC approve revisions to GGR 1.3.5a, 1.4, 1.9.4 and 1.9.6 effective Fall 2018.

The following GGRs relate to the examining committee for master’s and doctoral defences. Terminology used for the various roles on the examination committee has caused confusion. The proposed revisions “rename” the existing roles, reorganize the sections and update the regulation to incorporate the modern thesis submission.

Motion 2:
That SGSC approve the revisions to GGR 1.9.1 and 1.9.3, effective Fall 2018.

The following GGR relates to the role of the external examiner and an addition has been made to the regulation to provide more clarity on what is expected when the external is participating in absentia.

Motion 3:
That SGSC approve the revision to GGR 1.9.5 effective Fall 2018.

The following GGR relates to the classification of a thesis examination. For the purpose of this regulation it also includes projects examined as a thesis. The proposed revision includes reordering the outcomes and the creation of a submission deadline.

Motion 4:
That SGSC approve the revision to GGR 1.10.2 effective Fall 2018.

The following GGR relates to the recommendation for the award of degree. The proposed revision provides clarity regarding types of revisions and when the recommendation should be made.

Motion 5:
That SGSC approve the revision to GGR 1.10.3 effective Fall 2018.

The following GGR relates to the library submission. The proposed revision provides clarity regarding which capstones follow Library submission and requirements for revisions.

**Motion 6:**
That SGSC approve the revision to GGR 1.10.4 effective Fall 2018.

The following GGR relates to postponement of publications. The proposed revision is largely editorial and provides clarity that this GGR includes all Library submissions not only thesis.

**Motion 7:**
That SGSC approve the revision to GGR 1.11.3 effective Fall 2018.
MEMORANDUM

ATTENTION: Jeff Derksen,
Chair of Senate Graduate Studies
Committee (SGSC)

FROM: Ed Park, Graduate Program Chair of
Special Arrangements (SAR)

DATE: December 14, 2017

RE: Program Changes

Special Arrangements program would like to change the program name from Special Arrangements (SAR) to Individualized Interdisciplinary Studies (INS) to reflect the focus of the program and help prospective students, staff and faculty distinguish the program from Cohort Special Arrangements.

Motion 1:
That SGSC approve revision to GGR 1.3.5 effective Fall 2018.

Motion 2:
That SGSC approve the creation of the new acronym INS (Individualized Interdisciplinary Studies) effective Fall 2018.

Motion 3:
That SGSC change the course acronym from SAR to INS for all SAR courses effective Fall 2018.

Attached is a list of our graduate courses with the required editorial changes noted.

Thank you,

Dr. Ed Park
Graduate Program Chair, Special Arrangements
**Summary of change:**
Change title of “Special Arrangements” program to “Individualized Interdisciplinary Studies”

**Rationale for change:** We propose this revision as it is reflective of the program, and is used at many Canadian institutions including UBC, University of Calgary, Waterloo (Joint interdisciplinary), and UVic. The program title Special Arrangements (SAR) was perceived to imply that students in the program needed additional assistance or a modified program to suit their needs. The title caused confusion for students, staff and faculty as the name is similar to Cohort Special Arrangement which is separate and distinct type of program. Additionally, the proposed title highlights the student’s program of study is individualized and that admission for one student does not set a precedent for other graduate students with similar interests.

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<tr>
<th>FROM</th>
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<tbody>
<tr>
<td><strong>1.3.5 Admission Under Special Arrangements</strong></td>
<td><strong>1.3.5 Admission Under Individualized Interdisciplinary Studies</strong></td>
</tr>
<tr>
<td>Exceptionally able applicants who wish to work for a master's or doctoral degree outside or between existing programs at Simon Fraser University may apply to work under special arrangements. A student applying for special arrangements must have a well developed plan of studies in an area that can be shown to have internal coherence and academic merit, and in which the university has appropriate expertise and interest among its faculty members. Graduate students applying or working under special arrangements are required to conform to Senate regulations for graduate students. However, there are additional regulations which concern only those applying or working under special arrangements. For more details, go to the Special Arrangements (SAR) website. Students working under special arrangements may be required to complete a selection of courses from existing programs.</td>
<td>Exceptionally able applicants who wish to work for a master's or doctoral degree outside or between existing programs at Simon Fraser University may apply to work under Individualized Interdisciplinary Studies. A student applying for Individualized Interdisciplinary Studies must have a well developed plan of studies in an area that can be shown to have internal coherence and academic merit, and in which the university has appropriate expertise and interest among its faculty members. Graduate students applying or working under Individualized Interdisciplinary Studies are required to conform to the Graduate General Regulations. However, there are additional regulations which concern only those applying or working under Individualized Interdisciplinary Studies. For more details, go to the Individualized Interdisciplinary Studies website. Students working under Individualized Interdisciplinary Studies may be required to complete a selection of courses from existing programs.</td>
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**MOTION 1: Calendar Entry Change for GGR 1.3.5a**

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<tr>
<th><strong>Summary of change:</strong></th>
<th>Editorial</th>
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<tbody>
<tr>
<td><strong>Rationale for change:</strong></td>
<td>Editorial change to clarify that CSAR programs have their tuition fees posted in the Calendar</td>
</tr>
<tr>
<td><strong>Will this change impact current students?</strong></td>
<td>The current practice is not changing, merely, a clarification in the GGR</td>
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<tr>
<td><strong>1.3.5a Cohort Special Arrangements</strong></td>
<td><strong>1.3.5a Cohort Special Arrangements</strong></td>
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<td>Cohort-based special arrangements programs are designed to meet the educational needs of specific student groups in fulfilling the requirements for a graduate credential (certificate, diploma or master's degree) where these needs cannot be met within existing programs. Each program will be comprised of a curriculum and a set of program requirements recommended by each program's graduate program committee, approved by the faculty graduate studies committee and by the senate graduate studies committee. Students may undertake this program only through specific admission to the cohort program. Admission criteria, credential requirements and any other special conditions for a particular cohort special arrangements program must be approved in advance by the senate graduate studies committee; these may not be below the minimum admission and graduate credential requirements of regular graduate programs. In some instances, tuition fees may differ from the regular graduate fee schedule published in the Calendar, and will be announced separately.</td>
<td>Cohort-based special arrangements programs are designed to meet the educational needs of specific student groups in fulfilling the requirements for a graduate credential (certificate, diploma or master's degree) where these needs cannot be met within existing programs. Each program will be comprised of a curriculum and a set of program requirements recommended by each program's graduate program committee, approved by the faculty graduate studies committee and by the senate graduate studies committee. Students may undertake this program only through specific admission to the cohort program. Admission criteria, credential requirements and any other special conditions for a particular cohort special arrangements program must be approved in advance by the senate graduate studies committee; these may not be below the minimum admission and graduate credential requirements of regular graduate programs. In some instances, tuition fees may differ from other programs in the same academic unit, please consult the Graduate Tuition Fees in the Calendar.</td>
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MOTION 1: Calendar Entry Change for GGR 1.4

Summary of change:
Editorial changes: change credit to unit and units completed to enrollment

Rationale for change: Editorial change to keep terminology consistent and to clarify that students pay their tuition based on enrollment and not completion

Will this change impact current students?
The current practice is not changing, merely, a clarification in the GGR

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<tr>
<td>1.4 Enrollment</td>
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<td>Students are enrolled in one of two different types of programs. In ‘per term fee’ programs, students are charged a standard fee for each term of enrollment. In ‘per credit fee’ programs, students are charged a fee based on the number of units completed. (See Graduate Fees for current tuition fee rates.) All students are in ‘per term fee’ programs except for students in ‘per credit fee’ programs as listed under Graduate Fees.</td>
<td>Students are enrolled in one of two different types of programs. In ‘per term fee’ programs, students are charged a standard fee for each term of enrollment. In ‘per unit fee’ programs, students are charged a fee based on the number of units enrolled in for the term (See Graduate Fees for current tuition fee rates.)</td>
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### MOTION 1: Calendar Entry Change for GGR 1.9.4

**Summary of change:**
Editorial

**Rationale for change:** Editorial change to reflect the current practice that it is the Dean’s designate that may approve a doctoral examining committee and distribute the thesis.

**Will this change impact current students?**
The current practice is not changing, merely, a clarification in the GGR

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<td><strong>1.9.4 PREPARATION FOR EXAMINATION OF DOCTORAL THESIS</strong>&lt;br&gt;[...]&lt;br&gt;The candidate's supervisory committee shall make a recommendation to the chair of the graduate program committee concerning the composition of the examining committee (in conformity with 1.9.3) and the date, location, and time of the thesis examination. Upon approval of the chair of the graduate program committee, this recommendation, along with the thesis and all relevant documentation, shall be sent to the dean of graduate studies for final approval. These items shall reach the dean of graduate studies no later than six weeks before the examination date. Once approved, the dean of graduate studies shall formally invite the external examiner and distribute digital copies of the completed thesis to the examining committee. Any changes to the date of the examination must be approved by the dean of graduate studies. The examination of the thesis shall take place under the regulations for thesis examination given in <strong>1.10.1</strong>.</td>
<td><strong>1.9.4 PREPARATION FOR EXAMINATION OF DOCTORAL THESIS</strong>&lt;br&gt;[...]&lt;br&gt;The candidate's supervisory committee shall make a recommendation to the chair of the graduate program committee concerning the composition of the examining committee (in conformity with 1.9.3) and the date, location, and time of the thesis examination. Upon approval of the chair of the graduate program committee, this recommendation, along with the thesis and all relevant documentation, shall be sent to the dean of graduate studies or designate for final approval no later than six weeks before the examination date. Once approved, the dean of graduate studies or designate shall formally invite the external examiner and distribute digital copies of the completed thesis to the examining committee. Any changes to the date of the examination must be approved by the dean of graduate studies or designate. The examination of the thesis shall take place under the regulations for thesis examination given in <strong>1.10.1</strong>.</td>
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MOTION 1: Calendar Entry Change for GGR 1.9.6

Summary of change:
Editorial

Rationale for change: Editorial change to reflect the current practice that it is the Dean’s designate that may approve a doctoral examining committee and distribute the thesis.

Will this change impact current students?
The current practice is not changing, merely, a clarification in the GGR

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<th>FROM</th>
<th>1.9.6 NOTIFICATION OF DOCTORAL THESIS EXAMINATION</th>
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<td>Once the examination has been approved by the dean of graduate studies, the chair of the graduate program committee is responsible for notifying the candidate, examining committee, faculty dean(s), and the University community of the approved date, location, and time of the thesis examination. This notification should happen no later than two weeks before the examination date. If there are any changes to the date, location, and/or time of the thesis examination, the chair of the graduate program committee is responsible for informing the candidate, examining committee, faculty dean(s), and the University community. The dean of graduate studies is responsible for notifying the external examiner of any changes.</td>
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<td>Once the examination has been approved by the dean of graduate studies or designate, the chair of the graduate program committee or designate is responsible for notifying the candidate, examining committee, faculty dean(s), and the University community of the approved date, location, and time of the thesis examination. This notification should happen no later than two weeks before the examination date. If there are any changes to the date, location, and/or time of the thesis examination, the chair of the graduate program committee or designate is responsible for informing the candidate, examining committee, faculty dean(s), and the University community. The dean of graduate studies or designate is responsible for notifying the external examiner of any changes.</td>
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MOTION 2: Calendar Entry Change for GGR 1.9.1 and 1.9.3

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<tr>
<th>Summary of change:</th>
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<tr>
<td>- Change in terminology for the examining committee (removal of the term internal examiner)</td>
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<td>- Clarification of the type of programs that need to follow the examination regulations listed within this section</td>
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<tr>
<td>- Editorial changes to eliminate self-references to that same subsection within the GGR (ie. Referral to policy 1.9.1 within 1.9.1)</td>
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<td>- Reordering within the section for clarity</td>
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<td>- Removal of reference to physical copies of a project being required</td>
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<th>Rationale for change:</th>
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<td>In doctoral examining committees there is an internal examiner (or internal external examiner in FASS) and an external examiner. Examinations for master's thesis require only an internal examiner, however, it is often that this examiner is not from within SFU. Therefore, the proposed change will clarify the consistency between the doctoral and master's examining committee and aid in the understanding of the flexibility for who is eligible to be an examiner for the different types of examination.</td>
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<tbody>
<tr>
<td>1.9.1 EXAMINING COMMITTEE FOR A MASTER’S DEGREE CANDIDATE Each candidate for a master’s degree shall be examined on the thesis, extended essays, field or comprehensive examination, or project. The nature of the examination and the composition of the examining committee of a student’s extended essay, field or comprehensives, or project examined by two readers, shall be as designated by the appropriate faculty graduate studies committee with the approval of the dean of graduate studies. Examination of projects (as per 1.9.1) for all graduate programs shall be as for the examination of theses with the same requirements for committee composition unless a different examination process has been designated by the appropriate faculty graduate studies committee with the approval of the dean of graduate studies. Examination of projects (as per 1.9.1) for all other graduate programs shall be as for the examination of theses with the following exceptions: when the project is live, taped or filmed, only one presentation is required for examination, and only one recording is required for deposition in the library. The one copy deposited in the library shall be the property of the University. The student</td>
<td>1.9.1 EXAMINING COMMITTEE FOR A MASTER’S DEGREE CANDIDATE Each candidate for a master’s degree <strong>under 1.7.2a, 1.7.2b, or 1.7.2c will have an examination.</strong></td>
</tr>
</tbody>
</table>
shall have the right to copy the original, and the right to borrow it for external showing at the discretion of the librarian.

Where such an examination is required for a thesis the examining committee shall have the following minimum composition.

a) the chair of the student's graduate program committee, or designate, who shall be a non-voting chair of the examining committee. If the chair of the graduate program committee is also on the student's supervisory committee, the chair shall designate a member of faculty at this University, who is not a member of the student's supervisory committee, as chair.

b) all members of the student's supervisory committee.

c) a member of faculty at the university, or a person otherwise suitably qualified, who is not a member of the student's supervisory committee. For those seeking a degree under special arrangements, this person shall be from outside the University. For a thesis examination in the Faculty of Arts and Social Sciences, a master's examiner may not be a member of the same department as the one granting the degree, unless a waiver is granted by the Dean of Arts and Social Sciences or designate.

The examining committee for examinations under 1.7.2a and 1.7.2b shall have the following minimum composition:

a) the chair of the student's graduate program committee, or designate, who shall be a non-voting chair of the examining committee. If the chair of the graduate program committee is also on the student's supervisory committee, the chair shall designate a member of faculty at this University, who is not a member of the student's supervisory committee, as chair.

b) all members of the student's supervisory committee.

c) an examiner who is a member of faculty, or a person suitably qualified, who is not a member of the student's supervisory committee. For a thesis examination in the Faculty of Arts and Social Sciences, normally the examiner may not be a member of the student's department, unless a waiver is granted by the dean of arts and social sciences or designate.

Examination of projects (under GGR 1.7.2b program requirements) may have a different examination process if it has been designated by the appropriate faculty graduate studies committee with the approval of the dean of graduate studies. When the project is live, taped or filmed, only one presentation is required for examination, and a digital copy is required for deposition in the library.

All examinations under 1.7.2a and b shall follow publication and copyright outlined in GGR 1.11.

For students' completing under 1.7.2c the examination is examined by two readers, designated by the appropriate
Doctoral Students

1.9.3 EXAMINING COMMITTEE FOR DOCTORAL THESIS
Each candidate for a doctoral degree shall be examined on the thesis. Each examining committee shall have the following minimum composition:

a) the chair of the graduate program committee, or designate, who shall be a non-voting chair of the examining committee. If the chair of the graduate program committee is also on the student’s supervisory committee, the chair shall designate a member of faculty at the University, who is not a member of the student’s supervisory committee, as chair.

b) all members of the student’s supervisory committee

c) a member of faculty at the University or a person otherwise suitably qualified, who is not a member of the student’s supervisory committee. For a thesis examination in the Faculty of Arts and Social Sciences, normally the ‘internal external’ examiner will not be a member of the same department as the one granting the degree.

d) an external examiner who shall be specifically qualified in the field of the thesis and not be a member of faculty at the University

faculty graduate studies committee with the approval of the dean of graduate studies or designate. Examinations under 1.7.2c may be required to be submitted to the library. If mandatory this requirement will be listed on the program requirements in the Calendar and shall follow publication and copyright outlined in GGR 1.11.
### MOTION 3: Calendar Entry Change for GGR 1.9.5

**Summary of change:**
- Editorial changes regarding the external examiner's requirement to be present or attend the examination remotely.
- Clarification of the requirement if the external examiner is examining in absentia.

**Rationale for change:**
- The changes are currently outlined in a best practice documentation which is sent to external examiners. Including the specifics in the GGRs will allow all students, staff, and faculty to be aware of these requirements and alleviate confusion of responsibilities.

**Will this change impact current students?**
The current practice is not changing, merely, a clarification in the GGR.

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
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</table>
| 1.9.5 THE ROLE OF THE EXTERNAL EXAMINER  
The external examiner should be a distinguished scholar with particular research and supervisory experience in the field of the thesis research. The examiner shall be free from potential conflict of interest which may arise, for example, from research collaboration with the student or prospective employment of the student. Whether the external examiner will participate in person or in absentia, including the possibility of a conference telephone connection or similar means, will be determined by the dean of graduate studies who will take into account the departmental views.  
The external examiner shall be asked to report on the thesis. This report will normally be submitted two weeks before the examination date to the dean of graduate studies. If the report states that the thesis is ready for examination, a copy shall be sent to the chair of the graduate program committee by the dean of graduate studies for distribution to all members of the examining committee before the examination. The contents of the report will not be communicated to the student. If the report recommends that the examination be postponed, the dean shall send a copy to the senior supervisor and the chair of the graduate program committee. The chair of the graduate program committee and the senior supervisor will inform the student of the examination outcome 1.10.2. The report may contain specific questions the external examiner would like posed to the candidate. Those questions shall be directed to the candidate during the examination by the chair of the examining committee or members of the examining committee selected by the chair. | 1.9.5 THE ROLE OF THE EXTERNAL EXAMINER  
The external examiner should be a distinguished scholar with particular research and supervisory experience in the field of the thesis research. The examiner shall be free from potential conflict of interest which may arise, for example, from research collaboration with the student or prospective employment of the student. The external examiner may participate in person, video/telephone conference or in absentia.  
The external examiner shall be asked to report on the thesis. This report will normally be submitted two weeks before the examination date to the dean of graduate studies or designate. In the event the external examiner is examining in absentia, the report should be extensive and give a recommendation for the examination outcome 1.10.2. The report may contain specific questions the external examiner would like posed to the candidate. Those questions shall be directed to the candidate during the examination by the chair of the examining committee or members of the examining committee selected by the chair. |
the content of the report. Following discussions with the student and the supervisory committee, the chair of the graduate program committee shall report to the dean whether the examination will take place as scheduled or be postponed. Once the examination has taken place, and if the thesis is passed, the external examiner shall send a brief report to the senior supervisor which indicates the general quality of the thesis. That report (which may be either a copy of the initial report to the dean of graduate studies or a report prepared after the thesis examination) shall accompany the recommendation for award of the degree.

In the event of examination in absentia, the report of the external examiner should be quite extensive and give a specific recommendation as to whether the thesis ought to pass, fail, or be subject to revision as under 1.10.2. The report may contain specific questions the external examiner would like posed to the candidate. The report shall be copied, by the dean of graduate studies, to the chair of the examining committee, for distribution to all members of the examining committee before the examination. Specific questions raised by the external examiner in that report shall be directed to the candidate during the examination by members of the examining committee selected by the chair of the examining committee.

If the report states that the thesis is ready for examination, a copy shall be sent to the chair of the graduate program committee for distribution to all members of the examining committee before the examination. The contents of the report will not be communicated to the student until after the defence with permission of the examiner.

If the report recommends that the examination be postponed, the dean or designate shall send a copy to the senior supervisor and the chair of the graduate program committee. The chair of the graduate program committee and the senior supervisor will inform the student of the content of the report. The chair of the graduate program committee shall report to the dean or designate whether the examination will take place as scheduled or be postponed.
MOTION 4: Calendar Entry Change for GGR 1.10.2

Summary of change:
- Reordering the different classifications and outlining what is necessary when a re-examination is required
- Adding in a deadline to complete thesis submission to the library

Rationale for change:
- When outcome 3 occurs there has been confusion regarding the options. By clarifying the requirements and procedure, we anticipate it will allow examining committees to make more informed decisions on selecting outcome 3a or 3b.
- Adding a deadline for library thesis submission will prohibit students from staying enrolled in their program after completing their degree requirements.

Will this change impact current students?
Students in thesis programs will need to be informed prior to scheduling their defence what the implications are regarding the submission deadline.

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
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</table>
| **1.10.2 Classification of the Thesis**<br>There are four possible outcomes of the thesis examination. 1. the thesis may be passed as submitted 2. the thesis may be passed on the condition that revisions be completed to the satisfaction of the senior supervisor 3. the examining committee may defer making judgment if it judges that the thesis could pass after additional work by the candidate. A thesis upon which judgment is deferred shall come forward for re-examination within a period specified by the examining committee. The examining committee may require formal re-examination under section 1.10.1 or may reach its decision by examination of the revised thesis. The examining committee may not defer judgment a second time. 4. the thesis may be failed. In this case, the candidate is required to withdraw from the University. | **1.10.2 Classification of the Thesis**<br>There are four possible outcomes of the thesis examination. 1. the thesis may be passed as submitted 2. the thesis may be passed on the condition that revisions be completed to the satisfaction of the senior supervisor 3. the examining committee may defer making judgment if it judges that the thesis could pass after additional work by the candidate. The examining committee for the re-examination must remain the same, must set an end date for completion and may not defer judgment a second time. The examining committee may a) reach its decision by individual examination of the revised thesis or b) formal re-examination under section 1.10.1. The preparation for the re-examination does not follow 1.9.4. A date and time for the re-examination is set by the examining committee and may not be postponed once set. The revised thesis is distributed to the
<table>
<thead>
<tr>
<th>enrolled under special arrangements, the classification of the thesis may not be at a higher level than that of the external examiner. A decision to pass the thesis or to defer making judgment may not be reached on a tie vote of the examining committee. If at first a majority vote to pass the thesis cannot be reached, and subsequently, if a majority vote to defer judgment cannot be reached, the thesis will be failed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>examining committee including the external examiner by the chair of the graduate program committee or designate. No pre-defence report will be required from the external examiner.</td>
</tr>
<tr>
<td>4. the thesis may be failed. In this case, the candidate is required to withdraw from the University.</td>
</tr>
<tr>
<td>The decision of the examining committee is by simple majority vote except that, in the cases of doctoral candidates or candidates enrolled under <strong>individualized interdisciplinary studies</strong>, the classification of the thesis may not be at a higher level than that of the external examiner. A decision to pass the thesis or to defer making judgment may not be reached on a tie vote of the examining committee. If at first a majority vote to pass the thesis cannot be reached, and subsequently, if a majority vote to defer judgment cannot be reached, the thesis will be failed.</td>
</tr>
<tr>
<td><strong>Upon a successful completion, the thesis must be submitted to the library no later than the end of the subsequent term.</strong></td>
</tr>
</tbody>
</table>
### MOTION 5: Calendar Entry Change for GGR 1.10.3

| Summary of change: |  
| Recommendations for Award of degree should not be completed until the thesis has been approved by the examining committee or revisions completed as required. Clarity has been added as there should be no distinction between revisions and minor revisions. |

| Rationale for change: |  
| This change is proposed to ensure the academic unit is aware of when a student still has their thesis revisions outstanding. The previous version required the thesis minor revisions to be complete, however, did not include what occurs with what previously was considered major revisions. |

| Will this change impact current students? |  
| This will impact graduate staff which will be informed and assisted with the change. |

| FROM | TO |
| 1.10.3 Recommendation for the Award of the Degree | 1.10.3 Recommendation for the Award of the Degree |
| When a student has successfully defended the thesis and made any minor revisions required, the supervisory committee shall recommend award of degree. This recommendation goes for approval respectively to the graduate program committee, the faculty graduate studies committee, the senate graduate studies committee and senate, which has the final authority to award the degree. The title of the thesis, extended essays, professional-paper or project(s) will be recorded on the student's transcript. | When a student's program requirements include an examination as per 1.9.1 the recommendation for the award of degree will not take place until after the supervisory committee has approved any revisions to the thesis or project. When a student has successfully completed the degree requirements the recommendation for the award of the degrees goes for approval respectively to the graduate program committee, the faculty graduate studies committee, the senate graduate studies committee and senate, which has the final authority to award the degree. The title of the thesis, extended essays, paper or project will be recorded on the student's transcript. |
MOTION 6: Calendar Entry Change for GGR 1.10.4

Summary of change:
- Clarification that a library submission is deemed final and normally may not be changed after submission
- Addition of the deadline for submission after successful examination
- Clarification of library administrative procedure

Rationale for change:
This change is proposed to ensure the academic unit is aware of when a student still has their thesis revisions outstanding. The previous version required the thesis minor revisions to be complete, however, did not include what occurs with what previously was considered major revisions.

Will this change impact current students?
Students in thesis programs will need to be informed prior to scheduling their defence what the implications are regarding the submission deadline.

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<th>FROM</th>
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</table>

1.10.4 Submission of the Thesis to the Library

If the examining committee has required minor revisions to a thesis, these will be completed as soon as possible after the examination and checked by the senior supervisor. A digital copy of the final draft of the completed thesis shall be sent to the library together with a memorandum from the senior supervisor certifying that all required revisions have been made. The thesis will be deposited into the library’s institutional repository.

When the library’s assistant for theses has checked the thesis and accepted the format, the representative will notify the director of graduate programs, admissions and records. No degree will be approved by senate until the director of graduate programs, admissions and records has been so notified.

1.10.4 Submission to the Library

Theses and projects under GGR 1.7.2a and 1.7.2b are required to be submitted to the Library no later than the end of the subsequent term after their successful examination. Projects completed under GGR 1.7.2c and capstones required to be submitted to the Library will follow the requirements for a thesis below.

A digital copy of the final completed thesis shall be sent to the Library together with a memorandum from the senior supervisor certifying that all required revisions have been made. Once submitted the thesis is considered final and normally may not be changed. The Library’s Assistant for Theses will review thesis formatting and upon approval the thesis will be deposited into the Library’s institutional repository.

No degree examined as per 1.7.2a and 1.7.2b will be approved by senate until submitted to the Library.
MOTION 7: Calendar Entry Change for GGR 1.11.3

| Summary of change: |  
|  
Removal of technical names of forms and institutional repository (as they may change). |
| Rationale for change: | Clarification of the process and requirements for the postponement of publication |
| Will this change impact current students? | No |

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.11.3 Postponement of Publication</strong></td>
<td></td>
</tr>
</tbody>
</table>

A postponement will delay the inclusion of a thesis in the institutional repository and from copying for a period of 12 months from the date of examination of the thesis, in order to protect confidential commercial information, patentable material, pending application, or where immediate commercial publication is anticipated. **At the time of the thesis examination, Thesis Postponement of Publication Request Form shall be signed by the student, the senior supervisor, and the dean of graduate studies. The thesis and all pertinent forms shall be submitted to the library along with the postponement document.** A copy of the thesis shall not be sent to Library and Archives Canada during the restricted period.

In rare and exceptional circumstances a postponement of publication may be extended for an additional 12 month period. **Requests for such extensions should be submitted 60 days prior to the expiration of the current postponement using the Thesis Postponement of Publication Request form. This form should be accompanied with documented evidence justifying the extension.**

A postponement will delay the inclusion of a thesis in the institutional repository and from copying for a period of 12 months from the date of examination of the thesis, in order to protect confidential commercial information, patentable material, pending application, or where immediate commercial publication is anticipated. **A postponement request must be made in writing prior to the submission to the Library.** The submission process and timeline remains the same, however, a copy of the thesis or project shall not be made available in the Library institutional repository during the restricted period.

In rare and exceptional circumstances a postponement of publication may be extended for an additional 12 month period. **Requests for such extensions should be submitted 60 days prior to the expiration of the current postponement.**
MEMORANDUM

ATTENTION Senate
FROM Stephen Spector, Acting Chair
Senate Policy Committee on Scholarships, Awards and Bursaries

RE: Annual Report

I am pleased to submit the Annual Report of the Senate Policy Committee on Scholarships, Awards and Bursaries (SPCSAB) for the fiscal year 2016/2017.

Overview
SPCSAB is the committee charged by Senate with setting policy for the administration of awards, student scholarships, bursaries and other forms of financial aid at SFU. This is primarily for internal awards. Three other Senate committees, namely SUAAC (Senate Undergraduate Awards Adjudication Committee), SGAAC (Senate Graduate Awards Adjudication Committee) and SCUH (Senate Committee on University Honors) adjudicate financial awards to students where adjudication is needed. Financial Aid and Awards is a unit within Student Services, which processes bursary applications.

SPCSAB is not responsible for setting the amount of money available for scholarships, awards or bursaries. We include for information, reports from both undergraduate (Appendix 1) and graduate studies (Appendix 2) indicating how funds were distributed. Policy decisions by SPCSAB in the 2016/2017 period are detailed in Table 1.

Attachments
Table 1
Appendix 1 - SPCSAB 17-04
Appendix 2 - SPCSAB 17-05
### Table 1

<table>
<thead>
<tr>
<th>Month</th>
<th>Scholarship Type</th>
<th>Approval Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2017</td>
<td>Graduate Dean Entrance Scholarship</td>
<td>SPCSAB approved changes to the Terms of Reference for the Graduate Dean Entrance Scholarship effective Summer 2017</td>
</tr>
</tbody>
</table>
| May 2017    | Major Entrance Scholarship | SPCSAB approved:  
• the suspension of the SFU automatic scholarship programs for high school students and the existing Major Entrance Scholarships  
• reallocation of the SFU automatic scholarship and Major Entrance Scholarships funding to the new Entrance Scholarship program effective Spring 2019. |
| May 2017    | Entrance Scholarship      | SPCSAB approved the terms of reference for the SFU Entrance Scholarship Program for both domestic and international undergraduate students effective Fall 2018. |
| May 2017    | Major Entrance Scholarship | SPCSAB approved that current students who have been awarded the following Major Entrance Scholarships prior to the Fall of 2018:  
• Simon Fraser Entrance Scholarship  
• Simon Fraser Alumni Leadership Entrance Scholarship  
• Gordon M. Shrum Entrance Scholarship (includes Shad Valley Shrum and National Shrum)  
• SFU Africa Entrance Scholarship  
• SFU Aga Khan Academies Entrance Scholarship  
• W. Ronald Heath Entrance Scholarship for United World College students  
may elect prior to the start of the Fall 2018 term to comply with the terms of reference of the new SFU Entrance Scholarship program. Once made, this choice is irrevocable. |
| May 2017    | Major Entrance Scholarship | SPCSAB approved that the new Major Entrance Scholarship be reviewed no later than the end of the third year (Fall 2020) by the Senate Policy Committee on Scholarships, Awards and Bursaries. |
**Financial Aid and Awards - Student Services**

**Disbursement Summary of Funding Administered or Supported through Financial Aid and Awards**

**Comparative Report: Fiscal Year 2015/2016 vs. 2016/2017**

<table>
<thead>
<tr>
<th>Type of Financial Aid Support</th>
<th>FY 2015/2016</th>
<th>FY 2016/2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Awards Number</td>
<td>Total Disbursements</td>
</tr>
<tr>
<td>Internally Managed Financial Aid and Awards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrance Scholarships and Awards (University funded)</td>
<td>1,122</td>
<td>$3,599,456</td>
</tr>
<tr>
<td>Entrance Scholarships and Awards (Annual/Endowed)</td>
<td>275</td>
<td>$302,000</td>
</tr>
<tr>
<td>Subtotal</td>
<td>1,400</td>
<td>$3,901,456</td>
</tr>
<tr>
<td>Open Scholarship (Undergraduate)</td>
<td>1,984</td>
<td>$1,708,340</td>
</tr>
<tr>
<td>In-Course Awards (University funded)</td>
<td>424</td>
<td>$394,307</td>
</tr>
<tr>
<td>In-Course Awards (Annual/Endowed)</td>
<td>341</td>
<td>$424,442</td>
</tr>
<tr>
<td>In-Course Scholarships (Annual/Endowed)</td>
<td>470</td>
<td>$471,220</td>
</tr>
<tr>
<td>Subtotal</td>
<td>2,819</td>
<td>$2,986,309</td>
</tr>
<tr>
<td>Bursary (Open - Undergraduate - Domestic - University funded)</td>
<td>1,576</td>
<td>$1,988,705</td>
</tr>
<tr>
<td>Bursary (Open - Undergraduate - International - University funded)</td>
<td>1,105</td>
<td>$1,519,604</td>
</tr>
<tr>
<td>Bursary (International Supplement - Undergraduate - University funded)</td>
<td>879</td>
<td>$864,692</td>
</tr>
<tr>
<td>Bursary (Open - Graduate - Domestic - University funded)</td>
<td>257</td>
<td>$378,741</td>
</tr>
<tr>
<td>Bursary (Open - Graduate - International - University funded)</td>
<td>417</td>
<td>$582,621</td>
</tr>
<tr>
<td>Bursary (Designated)</td>
<td>132</td>
<td>$269,633</td>
</tr>
<tr>
<td>Bursary (Credit Based Graduate Programs)</td>
<td>92</td>
<td>$117,270</td>
</tr>
<tr>
<td>Bursary (Annual/Endowed - Undergraduate)</td>
<td>4,037</td>
<td>$1,332,716</td>
</tr>
<tr>
<td>Bursary (Annual/Endowed - Graduate)</td>
<td>72</td>
<td>$97,159</td>
</tr>
<tr>
<td>Subtotal</td>
<td>5,666</td>
<td>$7,170,511</td>
</tr>
<tr>
<td>Athletics Awards (University funding)</td>
<td>402</td>
<td>$620,541</td>
</tr>
<tr>
<td>Athletics Awards (Annual/Endowed)</td>
<td>371</td>
<td>$620,710</td>
</tr>
<tr>
<td>Subtotal</td>
<td>773</td>
<td>$1,241,251</td>
</tr>
<tr>
<td>Work-Study Program (Undergraduate)</td>
<td>354</td>
<td>$544,426</td>
</tr>
<tr>
<td>Work-Study Program (Graduate)</td>
<td>55</td>
<td>$84,893</td>
</tr>
<tr>
<td>Subtotal</td>
<td>409</td>
<td>$628,319</td>
</tr>
<tr>
<td>Total Internally Managed Financial Aid and Awards</td>
<td>13,816</td>
<td>$15,990,840</td>
</tr>
</tbody>
</table>

Externally Managed or Supported Financial Aid and Awards

<table>
<thead>
<tr>
<th>Type of Financial Aid Support</th>
<th>FY 2015/2016</th>
<th>FY 2016/2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Awards Number</td>
<td>Total Disbursements</td>
</tr>
<tr>
<td>StudentAid BC Loans and Grants</td>
<td>26,965</td>
<td>$45,536,804</td>
</tr>
<tr>
<td>Subtotal</td>
<td>26,965</td>
<td>$45,536,804</td>
</tr>
<tr>
<td>Out of Province Loans and Grants</td>
<td>1,310</td>
<td>$4,810,261</td>
</tr>
<tr>
<td>U.S. Loan Awards</td>
<td>276</td>
<td>$1,027,554</td>
</tr>
<tr>
<td>Subtotal</td>
<td>1,586</td>
<td>$5,837,815</td>
</tr>
<tr>
<td>Aboriginal Emergency Assistance</td>
<td>74</td>
<td>$51,760</td>
</tr>
<tr>
<td>Subtotal</td>
<td>74</td>
<td>$51,760</td>
</tr>
<tr>
<td>Non-SFU Administered External Scholarships, Awards, and Bursaries</td>
<td>315</td>
<td>$482,945</td>
</tr>
<tr>
<td>Subtotal</td>
<td>315</td>
<td>$482,945</td>
</tr>
<tr>
<td>Athletics Awards (B.C. Athletic Assistance Program)</td>
<td>62</td>
<td>$54,571</td>
</tr>
<tr>
<td>Subtotal</td>
<td>62</td>
<td>$54,571</td>
</tr>
<tr>
<td>Total Externally Managed or Supported Financial Aid and Awards</td>
<td>29,112</td>
<td>$51,585,833</td>
</tr>
</tbody>
</table>

Notes:
(a) Bursary - Open - includes funding for World University Services of Canada (WUSC) student and other university-funded bursaries.
(b) Bursary - International Student Supplement (new from 2015/16) - Recognizing that international tuition fees had increased significantly over a 3 year period, to help with these increased costs, undergraduate international students admitted in the 2014/15 academic year or earlier were provided a special bursary, the International Student Bursary Supplement.
(c) Bursary - Designated - includes Field School, Exchange International Co-op, Aboriginal (UGradGrad), Youth in Care, SFU Int Emergency Assistance, and International Student Supplement (new from 2015/16)
(d) New includes # of awards disbursed for SFSS BuildSFU Bursary which was created in Spring 2014
(e) The University fundings for athletic awards includes athletic entrance awards, recreation awards, international student-athlete awards, and female student-athlete awards.
(f) Externally-funded Athletic Awards were combined with the Annual/Endowed Athletic Awards category from 2015/16 onwards
(g) Work-Study hourly wage moved from $10.25 to $12.25.
(h) StudentAid BC funding for full-time and part-time students including any federal and provincial loan funding along with possible grant funding. Number awarded includes same student receiving more than one loan in the year.
(i) Non-SFU administered external financial aid and awards normally just requires proof of enrollment from institution. Funds are then disbursed to the student’s SFU account.
# Financial Summary of Graduate Scholarships/ Bursaries/ Awards (SBA) Budget

**Fiscal Year 2016/2017**

## BUDGET

- **Budget Allocation for FY2016/2017**
- **Add:** Scholarship funds carry forward Balance from FY2015/2016

**Total SBA Budget for FY2015/2016**

### EXPENSES (by academic term)

<table>
<thead>
<tr>
<th>Name of Award</th>
<th>Value of Award</th>
<th>Number of Award Payments</th>
<th>Expensed in Term ($)</th>
<th>Number of Award Payments</th>
<th>Expensed in Term ($)</th>
<th>Number of Award Payments</th>
<th>Expensed in Term ($)</th>
<th>Total number of award payments</th>
<th>Total Expensed in FY16/17 ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.D. Nelson Scholarships</td>
<td>up to $18,000 annually</td>
<td>71</td>
<td>401,250.00</td>
<td>56</td>
<td>364,000.00</td>
<td>45</td>
<td>267,000.00</td>
<td>172</td>
<td>1,082,250.00</td>
</tr>
<tr>
<td>Graduate Dean Entrance Scholarships</td>
<td>up to $21,000 annually</td>
<td>4</td>
<td>26,000.00</td>
<td>28</td>
<td>111,250.00</td>
<td>30</td>
<td>128,500.00</td>
<td>62</td>
<td>265,750.00</td>
</tr>
<tr>
<td>Graduate Fellowships</td>
<td>$3,250 or $6,500</td>
<td>217</td>
<td>1,176,500.00</td>
<td>354</td>
<td>1,953,250.00</td>
<td>364</td>
<td>1,878,500.00</td>
<td>935</td>
<td>5,008,250.00</td>
</tr>
<tr>
<td>Graduate Fellowships (Supplemental)</td>
<td>$3,250 or $6,500</td>
<td>7</td>
<td>55,250.00</td>
<td>7</td>
<td>39,000.00</td>
<td>12</td>
<td>84,500.00</td>
<td>26</td>
<td>178,750.00</td>
</tr>
<tr>
<td>President's PhD Scholarship</td>
<td>$6,500</td>
<td>16</td>
<td>104,000.00</td>
<td>14</td>
<td>91,000.00</td>
<td>7</td>
<td>45,500.00</td>
<td>37</td>
<td>240,500.00</td>
</tr>
<tr>
<td>Special Graduate Entrance Scholarships - General</td>
<td>$1,000- $10,000 annually</td>
<td>20</td>
<td>71,774.00</td>
<td>77</td>
<td>276,150.00</td>
<td>7</td>
<td>36,000.00</td>
<td>104</td>
<td>383,924.00</td>
</tr>
<tr>
<td>Provost Scholarships</td>
<td>$5,000 annually</td>
<td>104</td>
<td>187,681.00</td>
<td>113</td>
<td>198,561.00</td>
<td>96</td>
<td>157,755.00</td>
<td>313</td>
<td>543,997.00</td>
</tr>
<tr>
<td>Travel &amp; Minor Research Awards</td>
<td>varies</td>
<td>200</td>
<td>132,144.00</td>
<td>123</td>
<td>75,314.00</td>
<td>154</td>
<td>95,496.00</td>
<td>477</td>
<td>302,954.00</td>
</tr>
<tr>
<td>Graduate International Research Travel Awards</td>
<td>$1,000- $9,500</td>
<td>15</td>
<td>50,020.00</td>
<td>2</td>
<td>9,500.00</td>
<td>2</td>
<td>11,000.00</td>
<td>19</td>
<td>70,520.00</td>
</tr>
<tr>
<td>Dean's Leadership Travel Award</td>
<td>$1,000</td>
<td>2</td>
<td>2,000.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,000.00</td>
</tr>
<tr>
<td>Indigenous Graduate Student Travel Award</td>
<td>varies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>700.00</td>
<td>1</td>
<td>700.00</td>
</tr>
<tr>
<td>Graduate Aboriginal Entrance Scholarships</td>
<td>$15,000- $18,000 annually</td>
<td>5</td>
<td>28,000.00</td>
<td>5</td>
<td>30,000.00</td>
<td>5</td>
<td>30,000.00</td>
<td>15</td>
<td>88,000.00</td>
</tr>
<tr>
<td>Internal Graduate Award</td>
<td>$1,750</td>
<td>3</td>
<td>5,250.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5,250.00</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td><strong>664</strong></td>
<td><strong>2,206,619.02</strong></td>
<td><strong>779</strong></td>
<td><strong>3,138,025.00</strong></td>
<td><strong>718</strong></td>
<td><strong>2,784,951.00</strong></td>
<td><strong>2,148</strong></td>
<td><strong>8,172,845.00</strong></td>
</tr>
</tbody>
</table>

**Total Expenses in FY2016/2017**

<table>
<thead>
<tr>
<th>BALANCE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Additions to Scholarship Account (e.g., GGSF funding, VPR office for Supplemental GF)</td>
<td></td>
</tr>
<tr>
<td>Net Balance at Fiscal Year End (March 31, 2016)</td>
<td>134,030.00</td>
</tr>
<tr>
<td></td>
<td>491,400.86</td>
</tr>
</tbody>
</table>

**NOTES**

(1) These scholarships are paid over multiple terms and may include students receiving their first scholarship payment in previous fiscal years. The total expenses on this report reflects the number of payments made this fiscal year.
## Internally-Funded Graduate Awards

### Graduate Scholarships/Fellowships/Awards Funded by Graduate SBA Budget

<table>
<thead>
<tr>
<th>Name of Award / Program</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.D. Nelson Scholarships</td>
<td>16,000/yr (1-2yrs)</td>
<td>172</td>
<td>1,082,250.00</td>
<td>200</td>
<td>1,132,250.00</td>
<td>176</td>
<td>931,333.00</td>
</tr>
<tr>
<td>Graduate Dean's Entrance Scholarships</td>
<td>21,000 (2-4yrs)</td>
<td>62</td>
<td>265,750.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Graduate Fellowships (1)</td>
<td>3,250-6,500</td>
<td>936</td>
<td>5,008,250.00</td>
<td>816</td>
<td>4,485,125.00</td>
<td>806</td>
<td>4,206,250.00</td>
</tr>
<tr>
<td>President's PhD Scholarships</td>
<td>3,250-6,500</td>
<td>26</td>
<td>178,750.00</td>
<td>36</td>
<td>221,750.00</td>
<td>17</td>
<td>103,125.00</td>
</tr>
<tr>
<td>Special Graduate Entrance Scholarships</td>
<td>3,250 (avg 3,000)</td>
<td>104</td>
<td>383,924.00</td>
<td>80</td>
<td>352,350.00</td>
<td>85</td>
<td>341,017.00</td>
</tr>
<tr>
<td>Provost Scholarships</td>
<td>5,000/yr (1-3yrs)</td>
<td>313</td>
<td>543,997.00</td>
<td>305</td>
<td>540,331.00</td>
<td>267</td>
<td>463,241.00</td>
</tr>
<tr>
<td>Travel &amp; Minor Research Awards (1)</td>
<td>varies (avg 500)</td>
<td>477</td>
<td>302,954.00</td>
<td>461</td>
<td>318,708.00</td>
<td>431</td>
<td>290,553.00</td>
</tr>
<tr>
<td>Graduate International Research Awards</td>
<td>1,000-5,000</td>
<td>19</td>
<td>70,520.00</td>
<td>18</td>
<td>77,427.00</td>
<td>24</td>
<td>121,590.00</td>
</tr>
<tr>
<td>Dean's Leadership Travel Award</td>
<td>1,000</td>
<td>2</td>
<td>2,000.00</td>
<td>1</td>
<td>1,000.00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Indigenous Graduate Student Travel Award (formerly graduate Aboriginal travel stipend)</td>
<td>varies (avg $700)</td>
<td>1</td>
<td>700.00</td>
<td>2</td>
<td>1,400.00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Graduate Aboriginal Entrance Scholarships</td>
<td>$18,000/yr (2yrs)</td>
<td>15</td>
<td>88,000.00</td>
<td>16</td>
<td>90,000.00</td>
<td>13</td>
<td>73,000.00</td>
</tr>
<tr>
<td>Internal Graduate Award</td>
<td>1,750</td>
<td>3</td>
<td>5,250.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Graduate Scholarships/Fellowships Funded by Faculties/Schools

<table>
<thead>
<tr>
<th>Name of Award / Program</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Applied Sciences Graduate Fellowships</td>
<td>3,250</td>
<td>22</td>
<td>71,500.00</td>
<td>17</td>
<td>54,750.00</td>
<td>8</td>
<td>25,000.00</td>
</tr>
<tr>
<td>Faculty of Business Administration Graduate Fellowships</td>
<td>26</td>
<td>96,750.00</td>
<td>25</td>
<td>74,000.00</td>
<td>28</td>
<td>168,900.00</td>
<td></td>
</tr>
<tr>
<td>Faculty of Communication, Art &amp; Technology Graduate Fellowships</td>
<td>3,250</td>
<td>13</td>
<td>42,250.00</td>
<td>7</td>
<td>22,500.00</td>
<td>8</td>
<td>25,000.00</td>
</tr>
<tr>
<td>Faculty of Education Graduate Fellowships</td>
<td>3,250-6,500</td>
<td>12</td>
<td>36,250.00</td>
<td>8</td>
<td>28,250.00</td>
<td>7</td>
<td>25,000.00</td>
</tr>
<tr>
<td>Faculty of Health Sciences Graduate Fellowships</td>
<td>74</td>
<td>203,770.00</td>
<td>72</td>
<td>189,850.00</td>
<td>51</td>
<td>166,500.00</td>
<td></td>
</tr>
<tr>
<td>School of Computing Science Graduate Fellowships/ Scholarships</td>
<td>3,250-6,500</td>
<td>103</td>
<td>707,800.00</td>
<td>46</td>
<td>292,000.00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>School of Interactive Arts and Technology Graduate Fellowships</td>
<td>6,500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6,250.00</td>
</tr>
<tr>
<td>Global Communication Scholarship</td>
<td>13</td>
<td>41,536.00</td>
<td>12</td>
<td>45,999.00</td>
<td>7</td>
<td>57,498.00</td>
<td></td>
</tr>
<tr>
<td>Graduate Liberal Studies Scholarship</td>
<td>5</td>
<td>27,000.00</td>
<td>7</td>
<td>19,500.00</td>
<td>5</td>
<td>20,300.00</td>
<td></td>
</tr>
<tr>
<td>SFU Research Partnership Scholarship</td>
<td>26,340</td>
<td>2</td>
<td>52,680.00</td>
<td>1</td>
<td>17,560.00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ben-Gurion University / SFU Joint Scholarship</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Other Internally-Funded Awards

<table>
<thead>
<tr>
<th>Name of Award / Program</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
<th>Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Awards (supported by endowments &amp; annual donations)</td>
<td>varies</td>
<td>407</td>
<td>1,527,845.00</td>
<td>330</td>
<td>1,261,450.00</td>
<td>297</td>
<td>1,116,825.00</td>
</tr>
<tr>
<td>CTEF Graduate Fellowships (supported by Community Trust Endowment Fund)</td>
<td>6,500</td>
<td>14</td>
<td>91,000.00</td>
<td>11</td>
<td>64,500.00</td>
<td>15</td>
<td>93,750.00</td>
</tr>
<tr>
<td>VPR USRA Science (5)</td>
<td>4,500</td>
<td>57</td>
<td>256,600.00</td>
<td>58</td>
<td>261,000.00</td>
<td>80</td>
<td>340,570.00</td>
</tr>
<tr>
<td>VPR USRA Social Science and Humanities (5)</td>
<td>2,250-4,500</td>
<td>45</td>
<td>147,375.00</td>
<td>42</td>
<td>141,750.00</td>
<td>54</td>
<td>169,171.91</td>
</tr>
</tbody>
</table>

### Total Internally-Funded Graduate Awards

- **FY2016/2017**: 2,961,111,000.00
- **FY2015/2016**: 2,618,472,989.00
- **FY2014/2015**: 2,481,777,143.38

- **Total** Internally-Funded Graduate Awards: 7,027,374,332.38

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*Page 1 of 2*
### EXTERNALLY-FUNDED GRADUATE AWARDS

#### National scholarships funded by Federal funding agencies

<table>
<thead>
<tr>
<th>Name of Award</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSERC Graduate Scholarships</td>
<td>17,500-50,000 (1-4yrs)</td>
<td>220</td>
<td>197</td>
<td>1,702,016.00</td>
</tr>
<tr>
<td>NSERC Industrial Post-Grad Scholarships (excludes industrial portion)</td>
<td>15,000</td>
<td>16</td>
<td>27</td>
<td>131,250.00</td>
</tr>
<tr>
<td>SSHRC Graduate Scholarships</td>
<td>17,500-50,000 (1-4yrs)</td>
<td>347</td>
<td>330</td>
<td>2,772,117.00</td>
</tr>
<tr>
<td>CIHR Graduate Scholarships</td>
<td>17,500-50,000 (1-4yrs)</td>
<td>77</td>
<td>88</td>
<td>764,173.00</td>
</tr>
<tr>
<td>Canada Graduate Scholarships-M. Smith Foreign Study Supplements</td>
<td>5,300-6,000</td>
<td>7</td>
<td>5</td>
<td>28,749.00</td>
</tr>
<tr>
<td>NSERC Undergraduate Student Research Awards</td>
<td>4,500</td>
<td>79</td>
<td>72</td>
<td>324,000.00</td>
</tr>
</tbody>
</table>

#### Major scholarships funded by Provincial funding agencies

<table>
<thead>
<tr>
<th>Name of Award</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific Institute Climate Solutions Graduate Fellowships</td>
<td>12,000-18,000 (1-4yrs)</td>
<td>12</td>
<td>31</td>
<td>137,500.00</td>
</tr>
</tbody>
</table>

#### Other externally-funded awards and grants

<table>
<thead>
<tr>
<th>Name of Award</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSERC IPGS Industrial Sponsorships (contributed by industrial partners)</td>
<td>6,000</td>
<td>16</td>
<td>27</td>
<td>52,500.00</td>
</tr>
<tr>
<td>External Awards</td>
<td></td>
<td>47</td>
<td>53</td>
<td>205,175.00</td>
</tr>
<tr>
<td>Northern Scientific Training Program Grants</td>
<td></td>
<td>6</td>
<td>8</td>
<td>15,681.40</td>
</tr>
<tr>
<td>Centre for Digital Media Scholarships (MDM program)</td>
<td></td>
<td>51</td>
<td>38</td>
<td>317,500.00</td>
</tr>
<tr>
<td>NSERC and SSHRC GGSF Expenses (4)</td>
<td></td>
<td>45,500</td>
<td>45,500</td>
<td>45,500.00</td>
</tr>
<tr>
<td>CIHR Health Research Awards (5)</td>
<td></td>
<td>31,239</td>
<td>24</td>
<td>17,004.00</td>
</tr>
</tbody>
</table>

#### TOTAL EXTERNALLY-FUNDED GRADUATE AWARDS

<table>
<thead>
<tr>
<th>Name of Award</th>
<th>Award Duration/Value ($)</th>
<th>Number of Award Payments</th>
<th>Total Number of Award Payments</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSERC IPGS Industrial Sponsorships (contributed by industrial partners)</td>
<td>6,000</td>
<td>16</td>
<td>27</td>
<td>52,500.00</td>
</tr>
<tr>
<td>External Awards</td>
<td></td>
<td>47</td>
<td>53</td>
<td>205,175.00</td>
</tr>
<tr>
<td>Northern Scientific Training Program Grants</td>
<td></td>
<td>6</td>
<td>8</td>
<td>15,681.40</td>
</tr>
<tr>
<td>Centre for Digital Media Scholarships (MDM program)</td>
<td></td>
<td>51</td>
<td>38</td>
<td>317,500.00</td>
</tr>
<tr>
<td>NSERC and SSHRC GGSF Expenses (4)</td>
<td></td>
<td>45,500</td>
<td>45,500</td>
<td>45,500.00</td>
</tr>
<tr>
<td>CIHR Health Research Awards (5)</td>
<td></td>
<td>31,239</td>
<td>24</td>
<td>17,004.00</td>
</tr>
</tbody>
</table>

#### TOTAL GRADUATE AWARD FUNDS EXPENDED BY FISCAL YEAR

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total Expenses ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2016/17</td>
<td>3,861</td>
</tr>
<tr>
<td>FY2015/16</td>
<td>3,399</td>
</tr>
<tr>
<td>FY2014/15</td>
<td>3,365</td>
</tr>
</tbody>
</table>

**NOTES**

1. The total number of Graduate Fellowships reflects the number of award payments made to graduate students within the fiscal year. Starting Fall 2015, the value for one GF increased to $6,500.
2. In Fiscal years 2013 to 2016, there were two options to receive funds for the Travel & Minor Research Awards program. Departments could choose to pay the funds directly to the students and be reimbursed by Graduate Studies at the end of the academic year, or Graduate Studies would pay the funds directly to students via the Student Information System as a scholarship.
3. The figures for the VPR USRA in FY2014-15 includes a few awards that started in Spring 2015, but continued into the Summer 2015 term.
4. The NSERC & SSHRC GGSF expenses usually consists of reimbursement for various GF supplemental awards spending.
MEMORANDUM

TO Senate

FROM Peter Keller, Vice-President, Academic and Provost

RE Vice-President, Academic and Provost's Initiative on Equity, Diversity and Inclusion

DATE January 25, 2018

The Vice-President, Academic and Provost's (VPA) initiative on equity, diversity and inclusion is in furtherance of SFU's strategic vision. That vision includes fostering a culture of inclusion and mutual respect, and embracing the diversity of its students, staff and faculty.

The goal of the VPA's initiative is to facilitate a conversation with members of the university community about equity, diversity and inclusion and to develop a strategy, with a set of actionable recommendations, for advancing equity, diversity and inclusion across all facets of the university. This strategy will include a sustainable, institution-wide framework and structure for embedding equity, diversity and inclusion more deeply into SFU's practices, policies and procedures.

The VPA's initiative will complement, reinforce and advance the many and varied equity, diversity and inclusion activities already underway or currently under development at SFU as well as create the potential for new opportunities. The VPA's initiative will be informed by the work being championed by staff, faculty, students, units, groups, and committees across the university.

The VPA appointed Kim Hart in December 2017 as Special Advisor to the Provost on Equity and Diversity (see also “SFU launches new initiative to champion equity, diversity and inclusion”, accessible at https://www.sfu.ca/sfunews/stories/2017/12/sfu-launches-new-initiative-to-champion-equity-diversity.html).

The Special Advisor has started to work in collaboration with and alongside several others at SFU, including Professor Genevieve Fuji Johnson (Political Science) who has been appointed by the VPA as a Senior Advisor to the Provost's Office on Faculty Diversity, Inclusion and Engagement. This collaboration will continue to grow, evolve, and include many others at SFU who are engaged in this work as well as individuals, groups, and units in the SFU community who would like the opportunity to participate in the process.

During 2018, the Special Advisor, with the support of the Senior Advisor, will examine SFU's existing strategic plans, initiatives, data collection and analysis, policies and practices, and structures
and consider their impact on equity, diversity and inclusion. The Special Advisor, with the support of the Senior Advisor and with the advice of an advisory group, will also lead a consultation with the SFU community (staff, faculty, administrators and students – and especially with those from under-represented groups) to obtain input about how SFU can shape its structures, processes and practices to infuse and advance equity, diversity and inclusion in all aspects of the university and achieve its ongoing commitment to foster a culture of inclusion and respect. It is anticipated that the Community Consultation will be rolled out in March.

Following the consultation, the Special Advisor will review the input received and prepare a report to the VPA with recommendations for a sustainable, institution-wide framework that positions equity, diversity and inclusion as integral to all aspects of SFU. This report may include recommendations related to teaching, research, learning, employment, community engagement, and governance.

To guide this work, the Special Advisor will establish an Advisory Group consisting of faculty, staff, and students from across SFU’s three campuses, including members of equity-seeking groups. Drawing on their diverse backgrounds, skills, and knowledge, the Advisory Group will provide important insights into both the process and substance of the collaboration toward realizing greater equity, inclusion and diversity at SFU.

The Special Advisor will also bring together and facilitate a coordinating body consisting of university departments and offices who develop or provide programming and services related to equity, diversity and inclusion. This body will act as a vehicle for: creating new opportunities to advance equity, diversity and inclusion across SFU’s three campuses; supporting communication and the cross-pollination of existing and future initiatives; identifying and flagging for review and revision those SFU policies, procedures or practices that are, or have the potential to be, barriers to equity, diversity and inclusion; creating opportunities and mechanisms to acknowledge and celebrate the efforts and activities and initiatives at SFU that contribute to creating a supportive and equitable environment for working and learning, where respect, civility, diversity, and inclusion are valued.

There are several phases to this work. The VPA's Office has established an equity, diversity and inclusion webpage (accessible at: https://www.sfu.ca/vpacademic/equity-diversity-and-inclusion.html).

Regular updates will be provided to the university community as the process unfolds.
Valuing Teaching and the 5-Year Academic Plan

TAWG

January 25 2018

The Teaching Assessment Working Group, TAWG, was established by Vice President, Academic and Provost Peter Keller in August 2017 to encourage an active conversation amongst faculty at SFU about how we assess and value teaching. The group includes representation from all faculties, from SFUFA, SCUTL, and Faculty Relations, and includes both teaching and research faculty.

We have met with several groups to identify concerns and invite feedback, and we have also reviewed several recent reports related to these issues:

- Developing a Teaching Assessment Framework for Simon Fraser University: Final Report of the Student Evaluation of Teaching and Course Working Group (Draft)

Based on this work, we have articulated a number of issues that should be considered. We are sending this early summary of our work to inform the university community as it prepares the 2018-2023 Academic Plan.

To preface this discussion, we’ll start with SFU’s Mission Statement:

To be the leading engaged university defined by its dynamic integration of innovative education, cutting-edge research, and far-reaching community engagement.

Our belief is that an innovative education requires a faculty that is engaged in their teaching and that support and encouragement are required to enable faculty to create and implement innovations. However, various concerns about the climate for teaching and teaching support have been raised in our consultations:

- Faculty are reluctant to try new things because it may negatively impact their teaching assessments and evaluations
- Faculty do not feel their teaching is valued
- Teaching excellence is not broadly recognized, rewarded, celebrated or communicated
- TPCs are not comfortable using methods of teaching assessment other than student surveys
- There is a lack of alignment between departmental TPC Criteria and TPC practice
- After at least ten years of discussion and reports, some progress has been made (e.g. creation of TLC, introduction of university-wide student evaluation system, establishment of a new Associate Vice President, Academic - Learning and Teaching, introduction of Faculty Teaching Fellows) but more could be done to make ongoing professional development in teaching a core value of the institution.
Based on these concerns, we discussed what goals we would like to achieve in this 5-year planning cycle. We hope that faculty, academic units, and the university will keep these in mind during the development of their contributions to SFU’s 2018-2023 Academic Plan. Goals for faculty, academic units and the university are described below.

1. Faculty members are reflective practitioners within a community of teaching
   - They are aware of teaching expectations for their rank and position
   - They are reflective and responsive teachers
   - They adapt their teaching to changing environments
   - They are comfortable taking risks and are rewarded for experimenting with their teaching practices
   - They feel they are part of a culture where teaching is valued
   - Outstanding teaching is celebrated

2. Academic units value and reward teaching as one of the primary academic responsibilities
   - Expectations for different ranks for teaching and research faculty are clear
   - Teaching is valued at hiring and promotion
   - TPCs have the tools and knowledge to value effective teaching
   - Multiple teaching assessment methods are integrated into the work of TPCs
   - TPC criteria reflect best practice and current teaching research, and are used to inform tenure and promotion decisions; criteria, practice and assessment are aligned
   - Academic units identify and promote their best teachers for faculty, university and national teaching awards

3. The University provides support to faculty members and academic units for the design, development, delivery, and evaluation of quality teaching
   - SFU has articulated a vision statement and principles to provide direction and common purpose around teaching and learning
   - The capacity to understand teaching and evaluate it well is present in all steps in the process
   - There is a clear definition of expectations for both teaching effectiveness and teaching excellence, and the standards expected for different ranks for teaching and research faculty
   - A general framework for methods of teaching assessment has been adopted, which can be used to inform the work of academic units
   - There is a program of professional development and support that is clearly aligned with this evaluation framework
   - The University has established a support system to provide formative feedback and instructional development to all interested faculty
   - There is a program of support and/or training for all those involved in the review process
   - The expectations, evaluation framework, and support mechanisms are regularly reviewed
- Institutional policies regarding teaching and learning are regularly examined and revised
- The TLC is seen as primary resource for advancing quality teaching throughout the university

We hope you will consider these goals as you craft your submissions to SFU's 2018-2023 Academic Plan. During the next months TAWG will consider a road map of how these goals could be achieved. We will also be developing a set of strategies to value teaching practice and will be making recommendations to facilitate consistency, flexibility and robustness of reviews of teaching practice of use to all stakeholders.
Teaching Assessment Working Group
Strategies to Value Effective Teaching

Preamble

Some 54 Tenure and Promotion Committees (TPC's) exist across SFU each charged with reviewing faculty performance and providing recommendations. Each TPC develops review criteria consistent with their Faculty and disciplinary needs.

Faculty members are evaluated and promoted based on their performance in three areas as set out in the SFU-Faculty Collective Agreement, Section 28.5. These areas are Research, Teaching, and Service. Although the distribution of these areas is not mentioned in the collective agreement it is generally considered to be 40% Research, 40% Teaching and 20% Service for research faculty and 80% Teaching, 20% Service for teaching faculty (these percentages may vary depending on expectations).

In general, the metrics used to evaluate the research component are well known, consistent, and relatively straightforward to apply. The evaluation of teaching practice and related metrics are not as well known across disciplines and, in practice, may not be as consistent or as straightforward to apply. It is the belief of this working group that TPC's are committed to valuing teaching by fairly evaluating all components of a faculty members' teaching practice but may lack a consistent set of evaluation tools to choose from. It will beneficial to all to review best practices locally, at other institutions, and as identified in the literature and to share these with the SFU academic community.

Purpose of Working Group

The charge of this working group is to provide a set of strategies to value teaching practice and recommendations to facilitate consistency, flexibility, and robustness of reviews of teaching practice that are useful and usable by Faculty, Chairs, Tenure and Promotion Committees (TPCs), and Deans.

Scope

The working group should identify current practice and issues of concern by considering the following:

1. Review of current Departmental TPC Criteria to determine the types and ways in which teaching practice are being evaluated,
2. Review of current University Criteria,

January 15, 2018
3. The experiences of TPC Chairs and Deans,
4. The experiences of a sample of faculty members who have been reviewed,
5. The experiences of other groups e.g. SFUFA, SCUTL, Faculty Relations.

The working group should explore alternatives to current practice by considering, for example, the following:
1. Best practices at SFU including the types and range of strategies being used,
2. Best practices at other institutions in Canada including the types and range of strategies being used,
3. Recent literature relevant to faculty teaching reviews.

The working group will work to advance awareness of alternatives by considering, for example, the following:
1. Workshops for faculty with experts,
2. Promotion of discussions at department meetings,
3. Development of a website of resources

The working group will write a report summarizing their findings and develop a set of recommendations for different stakeholders regarding:

1. Strategies to celebrate teaching excellence,
2. A broad and flexible set of teaching competencies,
3. Methods for formative and summative evaluation of teaching,
4. Support for faculty including submission templates,
5. Clarification of Departmental and general University criteria,
6. Strategies to increase efficacy, fairness and efficiency,
7. Strategies to promote sustainability of the initiative.

Timeline

The work of this group should be completed by September 2018.

Proposed Membership

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<td>Andrew Perkins (GEOG)</td>
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