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THE UNIVERSITY OF BRITISH COLUMBIA

Okanagan Senate

THE THIRD REGULAR MEETING OF THE OKANAGAN SENATE
FOR THE 2015/2016 ACADEMIC YEAR

THURSDAY, 26 NOVEMBER 2015

3:30 PM to 5:30 pm – ASC 130

1. **Minutes of the Meeting of 29 October 2015 – Prof. Deborah Buszard**
(approval) (docket pages 3-14)

2. **Business Arising from the Minutes – Prof. Deborah Buszard** (information)

3. **Remarks from the Deputy Vice-Chancellor and Related Questions - Prof. Deborah Buszard** (information)

4. **Candidates for Degrees – Prof. Deborah Buszard** (approval)

   The list as approved by the faculties is available for advance inspection at Enrolment Services, and will also be available at the meeting.

   The Chair of Senate calls for the following motion:

   That the candidates for degrees as recommended by the faculties and the College of Graduate Studies, be granted the degrees for which they were recommended, effective November 2015, and that a committee comprised of the Registrar, the relevant dean(s), and the Chair of Senate be empowered to make any necessary adjustments.

   (2/3 majority required).

5. **Admissions & Awards Committee – Dr Marianne Legault**

   New and Revised Awards (approval) (docket pages 15-18)

6. **Curriculum Committee – Dr Peter Arthur**
   Curriculum Proposals for November for the faculties of Creative & Critical Studies, Health & Social Development, and Management (approval) (docket pages 19-46)

7. **Joint Reports from the Admissions & Awards and Curriculum Committee – Dr Peter Arthur**
   a. New Degree Proposal: Master of Science in Computer Science (approval) (docket pages 47-48, 50-95)
   b. New Degree Proposal: Master of Engineering Leadership in Resource Engineering Management (approval) (docket pages 47, 49, 96-146)

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8. **Nominating Committee – Dr Daniel Keyes**

    Committee Appointments (approval) (docket pages 147-148)

9. **Other Business**

. Regrets: Telephone 604.822.5239 or e-mail: facsec@mail.ubc.ca

UBC Senates and Council of Senate website: http://www.senate.ubc.ca

26 November 2015   Okanagan Senate   Docket Page 3 of 148
Okanagan Senate
www.senate.ubc.ca

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THE UNIVERSITY OF BRITISH COLUMBIA

OKANAGAN SENATE

MINUTES OF 29 OCTOBER 2015

DRAFT

Attendance

Present: Dr M. Piper, Dr K. Ross (Secretary), Mr B. Ali, Ms L. Allan, Dr P. Arthur, Dr L. Berg, Mr D. Bual, Dr D. Buszard, Dr R. Campbell, Dr D. Carter, Dr J. Castricano, Ms C. Comben, Dr J. Corbett, Mr I. Cull, Dean *Pro Tem*. R. Eggleston, Ms E. Gallaccio, Dean M. Grant, Dr J. Johnson, Dr D. Keyes, Dr D. Koslowsky, Dr C. Labun, Dr R. Lalonde, Dr R. Lawrence, Dr S. Lawrence, Dr M. Legault, Ms N. Legg, Dr Y. Lucet, Dr V. Magnat, Ms L. Marshall, Dr C. Mathieson, Mr J. McEwan, Dr S. McNeil, Ms L. Oleksewich, Dean M. Parlange, Dr R. Sadiq, Ms S. Sneg, Dean R. Sudgen, Ms N. Tasnim, Dean W. Tettey, Ms J. Vinek, Dr D. Walker, Mr L. Watt, Mr G Wetterstrand, Dr P. Wylie, Mr T. Zhang

Regrets: Dr P. Barker, Ms H. Berringer, Dean *Pro Tem*. G. Binested, Dr M. Evans, Ms L. Farrugia, Ms A. Fleming, Chancellor L. Gordon, Mr D. Oyelese, Dr J. Stites Mor (LOA), Mr L. Tan.

Recording Secretary: Mr C. Eaton

Call to Order

The Chair of Senate, Dr Martha C. Piper, called the second regular meeting of the Okanagan Senate for the 2015-2016 Academic Year to order at 3:32 pm. She noted that this was the first meeting of the Okanagan Senate that Dean Parlange was able to attend.

Senate Membership

The Registrar announced the following new members of Senate:

- Dr Andre Phillion, Faculty Representative for the Faculty of Applied Science, to replace Dr Spiro Yannacopoulos, resigned.
- Ms Lindsay Farrugia, Graduate Student Representative, to fill a vacancy.
- Ms Nishat Tasnim, Graduate Student Representative, to fill a vacancy.
- Mr Leo Tan, Student Representative for the Faculty of Health and Social Development, to fill a vacancy.
- Mr Laurence Watt, Student Representative at Large, to replace Ms Alliance Babunga, resigned.

Further, the Registrar informed Senate that Ms Nicole Legg has been acclaimed as elected to the Senate Nominating Committee until 31 March 2016 and thereafter until replaced.

Minutes of the Previous Meeting

Catherine Comben   }   *That the Minutes of the Meeting of 24 September*
Marianne Legault   *2015 be adopted as corrected.*

Corrections:

Senator Tettey was present.

Admission & Awards Committee title correction
on page 8.

Approved

Remarks from the Chair

President Piper noted that she just had the privilege of attending an event with over 40 Major
Entrance Scholarships winners, and that the Okanagan campus had established what it called a
"scholars' society" for those who won in previous years as a way of linking past recipients with
current students. The President opined that universities became great by having great students,
as those students push us the most to be great faculty. She further commented that our Major
Entrance Scholarships recipients could generally attend any school in the country, and that their
choice to come to the Okanagan campus was a testament to how much had been accomplished
on the campus in the past decade.

The President advised that at the next board meeting, a proposal would be considered by the
Board of Governors regarding international tuition; in June, the Board passed a resolution to
have the administration review our international tuition in light of our comparators and what
could potentially be done with new tuition revenues to build excellence. Dr Piper advised that
seeing as the Board had made that decision, the question now was how we do it: UBC's
international tuition is dramatically below the average of our peers, with some 15% below us to
some 200% above us for international undergraduate and applied masters programs. She
suggested that best comparators for such a conversation would be our Canadian and US west
coast peers, and that UBC was looking at a 15% increase per year over the next 3 or 4 years to
bring us closer to the median.

Dr Piper went on to state that regardless of their financial benefit, international students were a
key to excellence for a university – they bring diversity and a global perspective, and we have a
commitment and responsibility to educate students from around the world, particularly from
developing countries. We also know that to build excellence you need great students and great
faculty, and it order to do that you need resources to attract the best students and faculty. By
attracting the best faculty and students you create the best learning environment, an important
component of that is research. Dr Piper reminded Senate that BC was a small province of only
4.5 million in a relatively small country; we have to punch above our weight. She suggested that
UBC was in the right place to lead by our geography, our will, and our age, and we need the
resources to succeed. Those resources would need to come from provincial, federal, and private

sources, and tuition support. The President further noted that the University of Toronto and UBC were the only two universities in Canada that have a policy that no domestic student be denied access to the university based on financial considerations alone. She noted that UBC did not have such a policy internationally but suggested that this was something we should aspire towards.

Remarks from the Deputy Vice-Chancellor

The Deputy Vice Chancellor advised that the Board had their September board meeting in Kelowna, and at that meeting the Board had approved an Okanagan campus plan that looks towards the next 20 years. It is not a plan demanding growth but one that would let us do so when we need and decide to do so. The plan includes the development of a new innovation precinct between us and the airport business park, to be developed in concert with the city, airport, and the Westbank First Nation. This will give faculties who are engaged with business and enterprise an opportunity to co-locate partners near us. Secondly, the plan addresses transit and access, and we are pleased that the city is moving to create access using Bullman Road. The city will build it and we will maintain it on our campus and secure that area below the underpass. We have also forwarded our proposals for the transit exchange to be built next to EME to move some bus traffic. This is needed to allow for more buses. This will occur in concert with the John Hindle Drive extension over the next 2 years.

Dr Buszard further noted that last weekend, the Okanagan campus had its campaign celebration. We have met our campaign goal for UBCO and have now raised over 100 million dollars. This money is already allocated. To raise 100 million dollars is an extraordinary feet in the interior of BC, and for a campus that is only 10 years old, it is an enormous testament to UBC's reputation, and to the extraordinary work of development and our faculties. We will be building on that achievement and this sets a new bar for the Okanagan campus.

With regards to the University budget, the Principal advised that a head's meeting was held yesterday around the budget; she described this as a positive meeting and that conversation would be coming to Senate soon for conversation. We are looking at opportunities to increase our revenues while being very careful with our expenditures.

Finally, we are working through the ASPIRE process; academic planning and aboriginal strategy pieces are coming forward and will be brought to Senate for a broader conversation when needed.

> The President noted that in 2005 she went to the Kelowna Chamber of Commerce and said that we would raise $100 million in time and this was taken as impossible. She congratulated Dr Buszard and the campus on their achievement.

Academic Policy Committee

The Chair of the Senate Academic Policy Committee, Dean Miriam Grant, presented.

CONSIDERING MENTAL HEALTH AND WELLBEING IN ACADEMIC DECISION MAKING

Dean Grant advised that the Academic Policy Committee had received a proposal from the student senators to consider mental health and wellbeing in academic decision making. She asked Shira Sneg, Nicole Legg, and Lauren Oleskewich to give a brief presentation on their initiative.

Senator Sneg presented. She was a senator since 2013 and this is the first initiative from the student caucus. She stated that their goal was to maximize student academic success and retention. This presentation was taken to the Academic Policy Committee and it was felt that a broader conversation at the Senate would be useful.

The students noted that they were inspired by the student senator caucus in Vancouver who convinced that senate to create an ad hoc committee and adopt a policy framework for student mental health and wellbeing.

Senator Legg noted that there were many initiatives on campus for mental health, but many of these were reactive. The students would like to move towards a pro-active and systemic approach to student mental health and wellbeing.

Senator Oleksewich went over the American College Health Association survey at UBC Okanagan. Students identified stress and anxiety as factors affecting their academic success. She recognized that these were inherent at Universities, but any actions we could take to mitigate their negative effects would assist students. An increasing number of students have identified serious mental health issues.

She then went on to outline the UBCO Thrive Open Minds report. 59% of students indicated that mental health information would be best delivered by an instructor.

Senator Sneg went over Senate's role in this issue. She suggested that our policies, procedures and environment have a direct and indirect impact on student mental health.

Senator Sneg said that the students currently had 3 key priorities:

- Create a syllabus template.
- Provide resources for the faculties.
- Provide a list of primary contacts for faculty referrals.

Senator Legault said that there are a number of reactive measures already in existence. She noted that FCCS just had a presentation on Early Alert. She asked if that sort of pro-active approach to crises could work well with what the students were considering.

> Senator Legg said that they were aware of the early alert system and it most useful to help students already at risk or in crises and to connect them with resources as needed.

> Senator Legault said that they were advised to not wait until academic standings were compromised but to look for cues to recognize students in distress.

Senator Vinek noted that all first year nursing students were being instructed on stress management and relaxation, and this was having a positive effect on them.

> Senator Sneg mentioned that UVIC was a leader in this field and they do a course similar to this for all students. With regards to early alert, it can be proactive, but this is difficult with large classes.

Senator L. Berg said that he suspected that a lot of stress was from faculty members assigning too much work. Instructors needed to consider student workloads. He suggested that we needed guidelines for acceptable workloads, noting that the Bologna process outlined this in the EU. There may be a challenge for academic freedom but at least guidelines would be helpful.

Senator Tasnim asked what the distinction was between reactive and proactive. She did not accept the premise that our current resources were only reactive.

> Senator Oleksewich said that they viewed something as reactive if they engaged the service when already struggling or in crises. They viewed a proactive measure was one that stopped students from getting into such mental states. Proactive would be to look at our policies and procedures to take mental health better into account.

Senator Lalonde said that the greatest attrition happens in 1st year when students are least prepared and are in our largest classes. It is difficult to identify a nascent problem in a 300 person class. It was much different in a smaller class.

> A student senator agreed that it would be difficult in a 300 person class, but a majority of students would like to best hear this information from their instructor, say on the 1st day of class.

> Senator Cull said that when we ask our students before they arrive they all expect that they will perform at an A+ level because this is how they performed at high school. They are not in the cognitive space yet to understand that this is impossible. A faculty member preparing students and outlining resources available does help.

> Senator Sneg said that yes, they were thinking for first year, but we also have transfer students who may have Year 2 or 3 standing but be in their first year at UBC.

Senator Tettey encouraged us to look at the holistic student and the need to collaborate between academic and non-academic units such as housing. He suggested extending this conversation beyond faculty to all units where students spend significant amounts of time.

Senator Castricano referenced UBC Create where a lot of peer and discipline bonding occurred and asked if we could have more health and wellness in that week.

> Senator Sneg said that students were not likely to believe us before they experienced university.

Senator Buszard said that we don't exist within a bubble within UBC, and personal issues outside of school can be equal stressors to what is going on within the University.

DISESTABLISHMENT OF THE OKANAGAN SUSTAINABILITY INSTITUTE

Miriam Grant	}	*That Senate disestablish the Okanagan Sustainability*
Peter Arthur		*Institute, effective September 1, 2015.*

Dean Grant noted that OSI was established in December 2006, but since that time, all of its responsibilities had been better undertaken by other units.

The Provost suggested that this wasn't a bad precedent; as we establish more institutes we will need a more formative process to evaluate their usefulness and success. In response to a question from the floor, she advised that it wasn't that OSI was unsuccessful, rather, on review its work was being done well by other units.

Dean Sugden confirmed that the work undertaken by OSI was either completed or was being done in a variety of other units.

Approved

Admission & Award Committee

The Chair of the Senate Admission & Awards Committee, Dr Marianne Legault, presented.

NEW AWARDS

See Appendix A: Awards Report

Marianne Legault	}	*That Senate accept the new awards as listed and*
Ian Cull		*forward them to the Board of Governors for*
		approval.

Approved

Agenda and Nominating Committees

The Chair of the Senate Agenda and Nominating Committees, Dr Daniel Keyes, presented.

SENATE ATTENDANCE

Daniel Keyes   }   *That Rule 12 of the* Rules and Procedures of Senate
Peter Arthur   be struck and replaced as follows:

> *"Any elected member may miss up to two*
> *consecutive ordinary meetings of Senate. Any*
> *absence of three consecutive ordinary meetings*
> *shall result in a declaration of vacancy by the*
> *Secretary of Senate except if the member in question*
> *is granted a leave of absence for one or more of the*
> *missed meetings by the Senate Agenda Committee."*

Senator Keyes noted that the Nominating Committee had received some questions from senators regarding attendance rules, and in response, the Agenda and Nominating Committees have reviewed and were recommending an adjustment to those rules. This would set an equal and low bar for all senators to ensure reasonable attendance, as well as clarify by whom leaves were granted.

Senator Magnat advised that members may need to be absent for competing meetings.

> Senator Keys suggested that we needed to balance our obligations and be proactive in our scheduling, but that the Agenda and Nominating Committees would need to exercise reasonableness in considering attendance issues.

> Senator Legault replied that she agreed that the teaching schedule was clearly an extenuating circumstance, but argued that the previous rule was unreasonably lax.

Senator R Lawrence asked about the schedule change for Senate made last year from Wednesday to Thursday; would this be the new norm?

> Senator Keyes advised that the Agenda Committee had discussed this and was not proposing any change for next year.

Senator S Lawrence said that we had to be reasonable about both our schedules and what the agenda committee considered to be extenuating circumstances.

> Senator Keyes reassured the Senate that the Agenda Committee would be reasonable.

Senator Sneg spoke in favour of the motion, and asked if the Senate could provide some sort of accommodation for student schedules for committee meetings.

> The Associate Registrar, Mr Eaton, clarified the formal rule change was only for Senate meetings, not committees. For committee attendance, the Nominating Committee was generally happy to amend committee assignments in September once students knew their class schedules.

Senator Wetterstrand asked why 3 was chosen instead of 4.

Dr Keyes replies that this was so a senator could not miss an entire term of Senate without applying for a leave and explaining their reasons for absence.

Approved

Senator Wetterstand noted as opposed.

COMMITTEE ATTENDANCE

Senator Keyes reminded Senators that the Nominating Committee reserved the right to recommend changes to Senate committee memberships based on attendance, and further advised that the Nominating Committee had resolved that as a matter of principle, space permitting, all senators should be on at least one committee.

Curriculum Committee

See Appendix B: Curriculum Report

The Chair of the Senate Curriculum Committee, Dr Peter Arthur, presented.

Peter Arthur	}	*That Senate approve the new and revised courses*
Catherine Comben		*brought forward from the Faculty of Arts and*
		Sciences.

Senator Wylie asked if the two courses taught by the BC Cancer Agency would continue to be taught by the BCCA.

> The President clarified that they would have sessional or adjunct appointments with UBC.

Senator Lalonde asked why the title and pre-requisites were being changed for BIOC310.

> Senator McNeil explained that as a pre-requisite they selected any course where photosynthesis was taught sufficiently well. As for the course title, he explained that the change was because the course was focusing more on the molecules rather than metabolic processes, but was still under the general subject of biochemistry.

Approved

Report from the Provost

ASPIRE LEARNING AND TEACHING FUND

The Provost advised that an important theme of ASPIRE was transformative learning. Thus, we have set out to set up a support mechanism to engage faculty. We visited the faculties and had an open-ended discussion on operationalizing the notion of transformative elearning. From that, we

came up with the ASPIRE Learning and Teaching Fund (ALT Fund). The fund enables faculty members to make strategic changes within existing programs, or implement new, undergraduate and graduate academic programs that are more flexible, interdisciplinary, experiential and/or collaborative. A maximum of $50K is available per project, and projects may be up to 3 years in length. We're hoping to fund 3 of them. Our priority areas for the next year are:

- Enhance experiential learning opportunities.
- Increase flexibility by developing or redesigning a strategic course or full program for distributed delivery across multiple sites (e.g., bridge UBC Okanagan and UBC Vancouver). Course-based examples may include distributed flipped classrooms, reduced classroom time or fully online courses.
- Create mechanisms for students to develop, enhance and document their knowledge, skills and competencies in the context of their academic program.
- Utilize flexible learning techniques to modularize existing programs and/or to create new program structures (e.g., new minors).
- Develop open educational resources that are intended to be used in multiple courses within a program or across several programs.

The possibility of bridging across our campuses is very important, and as part of that, we are pleased to welcome Dr Michelle Lamberson to campus as Director of Flexible Learning Special Projects.

Dr Mathieson went out to state that the ALT Fund would request letters of intent that would them be reviewed by the Dean's Council.

Senator Keyes asked what the budget was for the ALT Fund.

> The Provost replied $150 000, but for great ideas we would go looking for funding elsewhere.

The Provost confirmed for Senator Vinek that the application process was online or would be within the week.

In response to a question from Senator Castricano, the Provost advised that the letter of intent should be brief; we are not yet asking for full proposals.

EXTERNAL REVIEW PROCESSES AND UPDATE

The Provost reminded Senators that that there was a distinction between various levels of periodic reviews – departments, school, faculty, accreditation, and ad hoc. She noted that the first academic unit review at the Okanagan campus was in 2008 for the College of Graduate Studies. Reviews of faculties and colleges are conducted by the Provost; reviews of departments and schools are under the purview of their responsible deans, but, historically, the Provost's office has worked with the deans for departmental review processes. Dr Mathieson further advised that in conducting reviews, her office has been using an updated version of the Vancouver review model.

26 November 2015   Okanagan Senate   Docket Page 12 of 148
OKANAGAN SENATE   14/15 - 10
MINUTES OF 29 OCTOBER 2015

Moving forward, the Provost advised that all unit reviews synopses would be posted to their faculty websites and a copy of each of the review reports would be deposited with the Secretary of Senate and made available to Senators. That follow-up would also be made available. On an annual basis, the Provost would report to the Senate on the reviews conducted that year.

Dr Mathieson went on to state that for faculties, our policy is that a review will normally occur prior to a search or consideration of extension to the term of a dean. She noted that so far, the Okanagan campus has only had 2 deans finish a full term. Moving forward, the Dean of COGS would like to be reappointed, and so a review of COGS will occur this year. The School of Engineering is also conducting a review next week.

Senator Johnson asked if the Faculties of Arts & Sciences or Creative & Critical Studies Barber or FCCS had ever been reviewed.

> The Provost replied no, but CCS was reviewed as two separate departments.

> Senator Johnson noted that there were discussions of a merger between the two faculties, and it struck him as odd to have that conversation without ever having a formal review.

> The Provost suggested that these discussions were occurring presently at the Faculty level, and this would also need to be a topic for discussion at a future Senate meeting.

Other Business

The Associate Registrar announced that as a result of the votes cast, Senator Marianne Legault had been elected to the Presidential Search Committee.

Adjournment

There being no further business, the meeting was adjourned at 5:22 pm.

Appendix A: Awards Report

New Awards:

International Leader of Tomorrow Bursary - tuition
Bursaries ranging in value up to the full annual cost of the student's academic program tuition and fees are offered to continuing international undergraduate students who were previously awarded the International Leader of Tomorrow Award and continue to demonstrate financial need but do not meet the Senate's academic criteria for a continuing award. The value of each bursary will depend on the applicant's financial circumstances. The bursary may be renewed for up to three additional years of undergraduate study or to degree completion, whichever is less, provided the recipient remains an international student on a valid Canadian study permit. Bursary recipients will have their situations reviewed annually by their Faculty as well as Enrolment Services regarding both academic progress and financial need.

International Leader of Tomorrow Bursary – living costs
Bursaries ranging in value up to the full cost of the student's living costs are offered to continuing international undergraduate students who were previously awarded the International Leader of Tomorrow Award and continue to demonstrate financial need but do not meet the Senate's academic criteria for a continuing award. The value of each bursary will depend on the applicant's financial circumstances. The bursary may be renewed for up to three additional years of undergraduate study or to degree completion, whichever is less, provided the recipient remains an international student on a valid Canadian study permit. Bursary recipients will have their situations reviewed annually by their Faculty as well as Enrolment Services regarding both academic progress and financial need.

Donald Wehrung International Student Bursary - tuition
Bursaries ranging in value up to the full annual cost of the student's academic program tuition and fees are offered to continuing international undergraduate students who were previously awarded the Donald Wehrung International Student Award and continue to demonstrate financial need but do not meet the Senate's academic criteria for a continuing award. The value of each bursary will depend on the applicant's financial circumstances. The bursary may be renewed for up to three additional years of undergraduate study or to degree completion, whichever is less, provided the recipient remains an international student on a valid Canadian study permit. Bursary recipients will have their situations reviewed annually by their Faculty as well as Enrolment Services regarding both academic progress and financial need.

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26 November 2015   Okanagan Senate   Docket Page 14 of 148
OKANAGAN SENATE   14/15 - 12
MINUTES OF 29 OCTOBER 2015

Appendix B: Curriculum Report

New and Revised Courses:

FROM THE FACULTY OF ARTS & SCIENCES

BIOC 310 (3) Plant Chemistry (revised course)

BIOC 425 (3) Biocatalysis

CHEM 336 (3) Green Inorganic Chemistry

COSC 335 (3) Introduction to Medical Imaging and Imaging Informatics

PHYS 336 (3) Introduction to Medical Imaging and Imaging Informatics

PSYO 435 (3) Substance Use and Abuse

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November 26, 2015

To: **Okanagan Senate**

From: **Admissions and Awards Committee**

Subject: **New and Revised Awards (approval) –**

Arvind GUPTA and Michelle Pereira Graduate Scholarship (new)
CENTENNIAL Scholars Entrance Awards (new)
CENTENNIAL Scholars Major Entrance Awards (new)
Graduate Dean's Entrance Scholarship (revised)
University Graduate Fellowship (revised)

The Admissions and Awards Committee is pleased to recommend the following to Senate:

Motion: That Senate accept the new and revised awards as listed and forward them to the Board of Governors for approval; and that a letter of thanks be sent to the donors where applicable.

New Award:

Background: The following award is for alternating years between the Vancouver campus and the Okanagan campus. It has been approved at the Vancouver Senate in May, 2015. The first award will be for the Vancouver campus.

1. Proposed Award Title: **Arvind GUPTA and Michelle Pereira Graduate Scholarship**

A $3,500 scholarship has been made available through an endowment established by Professor Arvind Gupta and Dr. Michelle Pereira. Professor Gupta began his leadership role as President and Vice-Chancellor of UBC in July, 2014 with the support of his wife, a UBC alumna (MD 1991). Eligible graduate students will be from any discipline and any year of study with the scholarship alternating years between UBC-Vancouver and UBC-Okanagan. The award is made on the recommendation of the Faculty of Graduate and Postdoctoral Studies (UBC-Vancouver) or the College of Graduate Studies (UBC-Okanagan). (First Award Available in the 2016/2017 Winter Session)

New Awards:

Background: At its inception, the Okanagan campus of UBC introduced an Entrance Award to be awarded to students entering UBC directly from secondary schools that would financially support academically qualified applicants who show an interest in joining the UBC community, but who would not be able to attend without significant financial assistance. This program offers entering students renewable awards up to $40000, payable over four years.

To commemorate the 100th anniversary of UBC, it is proposed that this award be renamed and rebranded to the Centennial Scholars Entrance Award. The award will continue to support direct entry from secondary school students but will now also consider transfer students. The program is designed to improve access to post-secondary education for all Canadian and permanent residents, especially those facing economic and/or social barriers. These proposed changes are being considered for a similar award program on the Vancouver campus.

The intent is to grow the program to a minimum of 100 Centennial Scholar Entrance Awards to be awarded annually collectively by Okanagan and Vancouver campuses with the anticipated support of the Development offices.

2. Proposed Award Title: **CENTENNIAL Scholars Entrance Awards**

The University of British Columbia offers entrance awards valued up to $10,000 to outstanding students entering university from secondary schools in Canada, or transfer students from other colleges and universities, or Canadian citizens living abroad. Criteria for these entrance awards include demonstrated academic and leadership achievements in the arts, sciences, community, athletics, and / or school. Recipients are academically qualified students with an interest in joining and contributing to the UBC Okanagan community but who would not be able to attend UBC without significant financial assistance. The awards are made on the recommendation of the Centennial Scholars Entrance Award Committee. (First Award Available in the 2015/2016 Winter Session)

3. Proposed Award Title: **CENTENNIAL Scholars Major Entrance Awards**

The University of British Columbia offers renewable entrance awards valued up to $40,000 over 4 years to outstanding students entering university from secondary schools in Canada, or transfer students from other colleges and universities, or Canadian citizens living abroad. Criteria for these entrance awards include demonstrated academic and leadership achievements in the arts, sciences, community, athletics, and / or school. Recipients are academically qualified students with an interest in joining and contributing to the UBC Okanagan community but who would not be able to attend UBC without significant financial assistance. Subject to continued scholarship standing, the awards will be renewed for a further three years of study or until the first undergraduate degree is obtained (whichever is the shorter period). The awards are made on the recommendation of the Centennial Scholars Entrance Award Committee. (First Award Available in the 2015/2016 Winter Session)

Revised Awards:
(Previously-approved awards with changes in terms or funding source):

Background: The College of Graduate Studies would like to revise two graduate-level awards to create greater flexibility for allocation and to ensure the criteria matches the College's criteria for quality. The number of recipients vary from year to year.

1. **Graduate Dean's Entrance Scholarship**

Present Award Title and Description: **Graduate Dean's Entrance Scholarship**

Graduate Dean's Entrance Scholarship Graduate Dean's Entrance Scholarships (GDES) are offered to the best and brightest incoming thesis-based master's and doctoral students at UBC's Okanagan campus. Students who have submitted a complete admission application by the date indicated for each admission period will be automatically considered for this scholarship.

Eligible students must have a GPA of first-class standing. The minimum value of the Graduate Dean's Entrance Scholarship is $5,000. This award value may be increased by increments of $2,500 to a maximum of $15,000. The funding for this award will be made available from the University budget. The value of this award is reviewed annually.

Awards are made on the basis of nominations provided by graduate programs to the College of Graduate Studies at the time of recommending a student for admission.

Proposed Award Title and Description: **Graduate Dean's Entrance Scholarship**

Graduate Dean's Entrance Scholarships (GDES) are offered to the best and brightest incoming **full- time** thesis-based master's and doctoral students at UBC's Okanagan campus. Students who have submitted a complete admission application by the date indicated for each admission period will be automatically considered for this scholarship.

Eligible students must have a GPA of first-class standing. **In addition the admission application's supporting documentation (CV, reference letters, letter of intent) is used for adjudication purposes.** The minimum value of the Graduate Dean's Entrance Scholarship is $5,000. This award value may be increased by increments of $2,500 to a maximum of **$25,000. However, if the student holds a major external award, such as an NSERC, SSHRC or CIHR, a maximum amount of $15,000 may be awarded in addition to the major award.** The funding for this award will be made available from the University budget. The value of this award is reviewed annually.

Awards are made on the basis of nominations provided by graduate programs to the College of Graduate Studies at the time of recommending a student for admission.

2. **University Graduate Fellowship**

Present Award Title and Description: **University Graduate Fellowship**

The University Graduate Fellowship (UGF) ~~is a~~ ~~merit-based scholarship~~ ~~that~~ is awarded to graduate students engaged in full-time ~~study or research in a~~ thesis-based program. ~~Incoming students are automatically considered for University Graduate Fellowship funding upon consideration for admission.~~ Current students~~, enrolled in an Okanagan graduate degree program,~~ must apply annually for University Graduate Fellowship funding.

Eligible students must have a GPA of first-class standing. This award may be received in increments of $3,000 to a maximum of $15,000. The funding for this award will be made available from the University budget. The value of this award is reviewed annually.

Awards are made on the basis of nominations provided by graduate programs to the College of Graduate Studies. ~~Graduate programs are encouraged to submit University Graduate Fellowship nominations for incoming students at the time of recommending the student for admission.~~ Nominations for current students may be submitted to the College of Graduate Studies as they are determined by the graduate program. ~~Normally, University Graduate Fellowships cover a 12-month period from May to April, of the following year.~~

Proposed Award Title and Description**: University Graduate Fellowship**

The University Graduate Fellowship (UGF) is awarded to current graduate students engaged in **a** full-time thesis-based program **at UBC's Okanagan Campus.** Current students~~-~~must apply annually for University Graduate Fellowship funding.

Eligible students must have a GPA of first-class standing in each of the last two years. **The UGF application is used for adjudication purposes.** This award may be received in increments of $3,000 to a maximum of **$24,000. However, if the student holds a major external award, such as an NSERC, SSHRC or CIHR, a maximum amount of $15,000 may be awarded in addition to the major award.** The funding for this award will be made available from the University budget. The value of this award is reviewed annually.

Awards are made on the basis of nominations provided by graduate programs to the College of Graduate Studies. Nominations for current students may be submitted to the College of Graduate Studies as they are determined by the graduate program.

Respectfully submitted,

Dr. Marianne Legault
Chair, Admissions and Awards Committee

Commented [UO1]: This is redundant. Fellowships are all merit-based.

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University Centre │ UNC 322
3333 University Way
Kelowna, BC Canada V1V 1V7

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Fax 250.807.8007
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November 13, 2015

To:	Okanagan Senate
From:	Curriculum Committee
Subject:	Curriculum Proposals (approval)

The Curriculum Committee has reviewed the material forwarded to it by the Faculties and encloses those proposals it deems ready for approval.

As such, the following is recommended to Senate:

Motion: *That Senate approve and recommend to the Board of Governors for approval the new courses brought forward from the Faculty of Creative and Critical Studies, the revised program academic regulations brought forward from Faculty of Health and Social Development and the revised courses brought forward from the Faculty of Management.*

     a.   From the Faculty of Creative & Critical Studies

         i.   ENGL 297 (3) Reading Animals

         ii.   ENGL 388 (3) Beyond Anthropocentrism

         iii.   ENGL 397 (3) Contemporary Environmental Writing

         iv.   ENGL 477 (3) Literature and Science

         v.   CULT 325 (3) Media and the Politics of Identity

         vi.   ARTH 396 (3) Seventeenth-Century European Art in a Global Context

         vii.   ARTH 397 (3) Latin American Art and Visual Culture Since 1521

         viii.   ARTH 403 (3) Global Surrealism

         ix.   CULT 460 (3) Posthumanism and Critical Animal Studies

         x.   ENGL 457 (3) Posthumanism and Critical Animal Studies

     b.   From the Faculty of Health & Social Development

         i.   B.H.K. Academic Regulations

     c.   From the Faculty of Management

Note: The motion is to approve the revision of the following four Faculty of Management Co-operative Education courses only. The current motion does not include any approval of a campus-wide Co-operative Education Program.

Although these four courses are revised so that the previous restriction to Faculty of Management students is now removed, this still does not allow non-Management students to participate in these Co-op courses for credit. Should any other Faculty wish to allow their own students to join Co-op courses, each Faculty must submit a proposal for Senate approval with Calendar language that enables their students to participate. This initiative is underway but has not reached Senate as yet.

    i.   MGCO 401 (3) Co-op Education Work Experience I

   ii.   MGCO 402 (3) Co-op Education Work Experience II

  iii.   MGCO 403 (3) Co-op Education Work Experience III

  iv.   MGCO 404 (3) Co-op Education Work Experience IV

For the Committee,

Dr. Peter Arthur
Chair, Curriculum Committee

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: FCCS	**Date:** 11/04/14
Dept./Unit: English	**Contact Person:** Dr G Garrard
Faculty/School Approval Date: March 30, 2015	**Phone:** 250.807.8479
Effective Session: 2016S	**Email:** greg.garrard@ubc.ca
Type of Action: New course.	

Rationale:
Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested students with a pathway through their degree with a focus on animals and/or the environment.

'Reading Animals' will be a broad-based critical animal studies course, covering literary theory, philosophy and a range of cultural artifacts (e.g. literature, film, digital media).

Draft Academic Calendar URL:
N/a

Present Academic Calendar Entry:
None

Proposed Academic Calendar Entry:

ENGL297(3) Reading Animals

Representations of animals in contemporary culture, including philosophical ethics, critical animal studies theory, and analysis of text and image. Explores novels, graphic novels, poems, plays and films that attempt to investigate and question the boundary we imagine to exist between ourselves and other animals. [3-0-0]

***Prerequisite:* 6 credits of 100-level English.**

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: FCCS	**Date:** 11/04/14
Dept./Unit: English	**Contact Person:** Dr G Garrard
Faculty/School Approval Date: March 30, 2015	**Phone:** 250.807.8479
Effective Session: 2016S	**Email:** greg.garrard@ubc.ca

Type of Action: New course.

Rationale:
Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested English students with a pathway through their degree with a focus on animals and/or the environment.

'Beyond Anthropocentrism' will be a focused intermediate level critical animal studies course, covering literary theory, philosophy and cultural artifacts (e.g. literature, film, digital media) relating to a specific area such as intersectional analysis or representations of a single species or genus.

Proposed Academic Calendar Entry: **ENGL388(3) Beyond Anthropocentrism** **Focuses on a specific aspect of the representation of animals in contemporary culture, such as intersections of species difference with gender/race, or representation of a particular species/genus. It combines detailed cultural analysis with theoretical and philosophical reflection on the relationship between the categories 'human' and 'animal'. [3-0-0]** **Pre-requisites:** **One of ENGL 200, ENGL 201, 203, ENGL 212, ENGL 213, ENGL 215, ENGL 220, ENGL 221, ENGL 222, ENGL 224, ENGL 226, ENGL 231,**	**Draft Academic Calendar URL:** **n/a** **Present Academic Calendar Entry:** None.

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ENGL 232, ENGL 233, ENGL 234, ENGL 240, ENGL 241, ENGL 242, ENGL 243, ENGL 250, ENGL 270, ENGL 294, CULT 210, CULT 230, CULT 270, CULT 275 and third-year standing, or 3 credits of 200-level English and third-year standing.	

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category **1**	
Faculty/School: FCCS	**Date:** 11/04/14
Dept./Unit: English	**Contact Person:** Dr Greg Garrard
Faculty/School Approval Date: March 30, 2015	**Phone:** 250.807.8479
Effective Session: 2016S	**Email:** greg.garrard@ubc.ca

Type of Action: New course.

Rationale:
Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested students with a pathway through their degree with a focus on animals and/or the environment.

'Contemporary Environmental Writing' will offer an intermediate-level introduction to ecocriticism and environmental writing, with a focus on a particular topic (e.g. 'Writing Pollution'), a national/regional emphasis (e.g. 'Contemporary British nature writing') or specific genre (e.g. 'Eco-poetry').

Draft Academic Calendar URL:
N/a

Proposed Academic Calendar Entry:

ENGL397(3) Contemporary Environmental Writing

An introduction to the theory and practice of ecocriticism alongside exploration of a specific aspect of contemporary environmental writing. [3-0-0]

Pre-requisites:
One of ENGL 200, ENGL 201, 203, ENGL 212, ENGL 213, ENGL 215, ENGL 220, ENGL 221, ENGL 222, ENGL 224, ENGL 226, ENGL 231, ENGL 232, ENGL 233, ENGL 234, ENGL 240, ENGL 241, ENGL 242, ENGL 243, ENGL 250, ENGL 270, ENGL 294, CULT 210, CULT 230, CULT 270, CULT 275 and third-year

Present Academic Calendar Entry:
None

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standing, or 3 credits of 200-level English and third-year standing.	

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category **1**	
Faculty/School: FCCS	**Date:** 11/04/14
Dept./Unit: English	**Contact Person:** Dr Greg Garrard
Faculty/School Approval Date: March 30, 2015	**Phone:** 250.807.8479
Effective Session: 2016S	**Email:** greg.garrard@ubc.ca

Type of Action: New course.

Rationale:
Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested students with a pathway through their degree with a focus on animals and/or the environment.

'Literature and Science' will offer students pursuing an Eco Cultures focus with an empirically-grounded alternative to the theoretically-orientated Posthumanism course. Versions could include Literature and the Sciences of the Mind, Writing Pollution, Culture and Climate Change, and Modifying Genotexts.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/a
	Present Academic Calendar Entry: None
ENGL477(3) Literature and Science	
Advanced critical analysis of engagement with science in contemporary literary texts. Focusing on a specific area of science, such as climate change, complexity theory, cognitive psychology, or genetic modification, the course seeks to build constructively critical relationships between disciplines. [3-0-0]	
Prerequisite: 9 credits of 300-level English	

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: Creative and Critical Studies **Dept./Unit:** Critical Studies **Faculty/School Approval Date:** 2015 Sept. 29 **Effective Session:** 2016W	**Date:** March 30, 2015 **Contact Person:** Dr. Ruthann Lee **Phone:** 250.807.9181 **Email:** ruthann.lee@ubc.ca

Type of Action:
New Course

Rationale:
This course provides a feminist intersectional approach to theorizing identity formations in media and popular culture, which is currently missing from the program. The course expands the Media and Popular Cultures stream and draws from studies of film, visual culture, and communications, including print, television, the internet, and emergent digital technologies to examine how different forms of representation alter being, reflect and produce relations of power, and shape identities. As a 300-level offering, the scope and focus reflect advanced theoretical and methodological approaches.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL: n/a**
CULT 325 (3) Media and the Politics of Identity **Examination of how cultural texts, including visual art, performance, literature, film, television, and social media, constitute modes of subjectivity and identity in modern Western contexts. [3-0-0]** *Prerequisite:* **At least 3 credits of CULT and third-year standing. CULT 100/101 recommended.**	**Present Academic Calendar Entry: n/a**

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: 1

Faculty/School: Creative and Critical Studies **Dept./Unit:** Critical Studies **Faculty/School Approval Date:** 2015 Sept. 29 **Effective Session:** 2016W	**Date:** 2014-11-29 **Contact Person:** Dr. R. Belton **Phone:** 250.807.9342 **Email:** robert.belton@ubc.ca

Type of Action: New Course

Rationale:
This course expands on first- and second-year innovations undertaken by the Art History and Visual Culture program to fill important gaps at the upper level and to diversify its offerings in keeping with the academic plan's emphasis on global citizenship. To be internationally competitive, students need to be aware that the traditional scholarly characterization of the seventeenth-century as homogeneous is now concerned also with its complexities and contradictions. In that regard, this course would be a welcome addition to the BA minor in Medieval and Renaissance Studies.

	Draft Academic Calendar URL: n/a
Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
ARTH 396 (3) Seventeenth-Century European Art in a Global Context **Studies of seventeenth-century European visual cultures during a period of rapid global expansion. [3-0-0]** *Prerequisite:* **Third-year standing.**	None

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: **1**

Faculty/School: Creative and Critical Studies **Dept./Unit:** Critical Studies **Faculty/School Approval Date:** 2015 Sept. 29 **Effective Session:** 2016W	**Date:** 2014-11-29 **Contact Person:** Dr. R. Belton **Phone:** 250.807.9342 **Email:** robert.belton@ubc.ca

Type of Action: New Course

Rationale:
This course expands on first- and second-year innovations undertaken by the Art History and Visual Culture program to diversify its offerings in keeping with the campus academic plan's emphasis on global citizenship and communities. Latin American Art is a richly detailed area of current research that varies and strengthens our upper-level offerings for a richer BA major. It also provides a useful option for the Latin American and Iberian Studies program at UBC Okanagan, as well as for the SPAN major in FCCS.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL: n/a**
ARTH 397 (3) Latin American Art and Visual Culture Since 1521 **Latin American art and visual cultures from the colonial period to the present. [3-0-0]** *Prerequisite:* **Third-year standing.**	**Present Academic Calendar Entry:** None

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: Creative and Critical Studies **Dept./Unit:** Critical Studies **Faculty/School Approval Date:** 2015 Sept. 29 **Effective Session:** 2016W	**Date:** 2014-12-08 **Contact Person:** Dr. R. Belton **Phone:** 250.807.9342 **Email:** robert.belton@ubc.ca

Type of Action: New Course

Rationale:
This course expands on first- and second-year innovations undertaken by the Art History and Visual Culture program to diversify its offerings in keeping with the campus academic plan's emphasis on global citizenship. It is directly in keeping with two of FCCS's research themes—"Literacies and Practices" and "Postcolonial Imaginaries"—and it takes advantage of ongoing research within the department.

Proposed Academic Calendar Entry: **ARTH 403 (3) Global Surrealism** **The development of Surrealism from its roots in 20th-century French thought to its global proliferation in film, literature, visual culture and contemporary theories. [3-0-0]** ***Prerequisite:* Third-year standing.**	**Draft Academic Calendar URL: n/a** **Present Academic Calendar Entry:** None

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: Faculty of Creative & Critical Studies **Dept./Unit:** Critical Studies **Faculty/School Approval Date:** January 14, 2015 **Effective Session:** 2016W	**Date:** January 12, 2015 **Contact Person:** Dr. J. Castricano **Phone:** 250.807.9196 **Email:** jodey.castricano@ubc.ca

Type of Action: New Course

Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested English students with a pathway through their degree with a focus on animals and/or the environment.

'Posthumanism and Critical Animal Studies" will be a broad-based, historically-derived critical animal studies theory course, covering ecofeminism, philosophy and a range of topics and materials germane to the study of the human/animal divide (e.g. articles from cognitive ethology, documentary film).

Proposed Academic Calendar Entry:

CULT460 (3) Posthumanism and Critical Animal Studies

Contemporary theories in the field of critical animal studies via ecofeminism, literary studies, philosophy and history with the aim of considering the interconnectedness of speciesism, racism and sexism. Particular attention will be paid to ecofeminism and the "ethics of care" in regards to the treatment of animals. Credit will not be granted for both CULT 460 and ENGL 457. (3-0-0) *Prerequisite:* **Third-year standing.** *Equivalency***: ENGL 457.**

Draft Academic Calendar URL:

Present Academic Calendar Entry:
n/a

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: Faculty of Creative & Critical Studies **Dept./Unit:** Critical Studies **Faculty/School Approval Date:** January 14, 2015 **Effective Session:** 2016W	**Date:** January 12, 2015 **Contact Person:** Dr. J. Castricano **Phone:** 250.807.9196 **Email:** jodey.castricano@ubc.ca

Type of Action: New Course

Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested English students with a pathway through their degree with a focus on animals and/or the environment.

'Posthumanism and Critical Animal Studies" will be a broad-based, historically-derived critical animal studies theory course, covering ecofeminism, philosophy and a range of topics and materials germane to the study of the human/animal divide (e.g. articles from cognitive ethology, documentary film).

Proposed Academic Calendar Entry:

ENGL457 (3) Posthumanism and Critical Animal Studies

Contemporary theories in the field of critical animal studies via ecofeminism, literary studies, philosophy and history with the aim of considering the interconnectedness of speciesism, racism and sexism. Particular attention will be paid to ecofeminism and the "ethics of care" in regards to the treatment of animals. Credit will not be granted for both ENGL 457 and CULT 460. (3-0-0)

Prerequisite: **9 credits of 300-level English.**
*Equivalency***: CULT 460.**

Draft Academic Calendar URL:

Present Academic Calendar Entry:
n/a

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: Faculty of Health and Social Development **Dept./Unit:** School of Health and Exercise Sciences **Faculty/School Approval Date:** April 22, 2014 **Effective Session:** 2015W Term 1	**Date:** Sept. 15, 2015 **Contact Person:** Dr. Paul van Donkelaar **Phone:** 250.807.8858 **Email:** paul.vandonkelaar@ubc.ca
Type of Action: Revision of Program	
Rationale: As the field of study of Health and Exercise Sciences (Human Kinetics) deals with and affects human health, it is imperative that our students have a grasp on more than half of the content. A knowledge base of only 50% (the current passing grade) when dealing with human health can have huge negative consequences, thus a higher pass grade ensures that our student are more prepared to act positively in careers in this field. This new grade standard requirement puts it in line with the nursing program, a very related/similar field. Operationally this could be implemented for 2015W Term 1 and the current students have been made aware of the regulations changing.	

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	Draft Academic Calendar URL: URL http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,346,1061,1288
## Academic Regulations	## Academic Regulations
Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
[15799] In addition to the general policies and regulations set out in Policies and Regulations, the following academic regulations listed apply to undergraduate students in this Faculty.	**[15799]** In addition to the general policies and regulations set out in Policies and Regulations, the following academic regulations listed apply to undergraduate students in this Faculty.
[15967] Academic Standing	**[15967] Academic Standing**
[15968] Supplementary to the University's policy on Academic Standing, the regulations below are applicable to B.H.K. students in this Faculty	**[15968]** Supplementary to the University's policy on Academic Standing, the regulations below are applicable to B.H.K. students in this Faculty.
Academic performance is evaluated based on coursework over a session. Sessional evaluations occur in April and will evaluate academic performance for the entire Winter Session (September to April).	
Four standings can result from the sessional evaluation: Good Standing, Dean's Honour Roll, On Academic Probation, and Failed. Sessional evaluation standings are recorded on the academic record and are the student's official standing with the university. A student's sessional evaluation outcome is the standing under which the student will return to or continue studies under.	

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[15969] On Academic Probation	**[15969] On Academic Probation**
On Academic Probation standing will be assigned at the end of the Winter Session (April) based on performance in that Winter Session (September – April). The evaluation will consider all courses taken in the session. On Academic Probation will be assigned to a student who has: • **earned a sessional average of less than 65% in Human Kinetic coursework only; or** • **earned an overall sessional average of less than 60%**	- On-Academic Probation will be assigned to a student who, ~~while not falling under the provisions for Failed standing~~, has: **[15971]** • ~~earned a term cumulative average of less than 55%; or~~ • ~~enrolled in 9 or more credits in a term and passed fewer than 60% of those credits; or~~ • ~~enrolled in fewer than 9 credits in a term and passed fewer than 50% of those credits.~~
[15972] A student placed On Academic Probation **standing in the sessional evaluation** will normally be allowed to register in a maximum of 9 credits in **their first** term **of the following Winter Session**. This restriction may be waived at the discretion of the Faculty. **A student with any previous sessional standing in the program of On Academic Probation and who earns another On Academic Probation will be automatically changed to Failed standing and required to withdraw or discontinue.**	**[15972]** A student placed On Academic Probation ~~at the end of the Winter Session~~ will normally be allowed to register in a maximum of 9 credits in ~~the following~~ term. This restriction may be waived at the discretion of the Faculty. ~~The credit restriction will only be enforced if the student is notified before the subsequent term begins.~~ **[15973]** ~~On Academic Probation is changed to In Good Standing if a student's cumulative average in the term in which he or she was on Academic Probation is 55% or higher.~~
[15974] Failed standing	**[15974] Failed standing**
Failed standing will be assigned at the end of the Winter Session (April) based on performance in that Winter	

Commented [UO1]: Link to B.H.K. Degree Requirements http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,346,1061,1287

UBC's Okanagan Campus – Curriculum Proposal Form

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Session (September – April). The evaluation will consider all courses taken in the session.

Failed standing will be assigned to a student who **has**:

- **a sessional average of less than 65% in Human Kinetic coursework and**
- **an overall sessional average less than 60% or**
- **a previous sessional standing of Academic Probation or Failed standing and receives another sessional evaluation of Academic Probation**

Commented [UO2]: Link to B.H.K. Degree Requirements http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,346,1061,1287

[15975] A student placed on Failed standing for the first time will normally be required to discontinue his or her studies for a period of one academic year (12 months) prior to resuming his or her program of study. A student who already has a Failed standing on his or her academic record (from any UBC program) will be required to withdraw from the University and may only be readmitted under the Advancement Regulations.

[15975] A student placed on Failed standing for the first time will normally be required to discontinue his or her studies for a period of one academic year (12 months) prior to resuming his or her program of study. A student who already has a Failed standing on his or her academic record (from any UBC program) will be required to withdraw from the University and may only be readmitted under the Advancement Regulations.

Failed standing will be assigned at the end of the Winter Session (April) based on performance in that session. The evaluation will consider all courses taken in the session.

Failed standing will be assigned to a student who has:

[15976]
- a sessional cumulative average less than 50%, passing fewer than 50% of the credits attempted in that session; or
- a sessional cumulative average of less than 45%.

[15977] Courses taken in the Summer Session are not taken into consideration for assigning Failed

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[15977] Courses taken in the Summer Session are not taken into consideration for assigning Failed standing.	standing, ~~although they are applicable for On Academic Probation.~~
[15800] Dean's Honour Roll	**[15800] Dean's Honour Roll**
[15801] Students in any Winter Session with a sessional average of at least 80% while taking 27 or more credits will receive the notation "Dean's Honour Roll" on their official transcript of academic record.	[15801] Students in any Winter Session with a sessional average of at least 80% while taking 27 or more credits will receive the notation "Dean's Honour Roll" on their official transcript of academic record.
[insert table here as shown below]	

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Examples: Sessional Evaluation standings impact on progression

The below table is provided to assist in applying the sessional evaluation rules and standings in a visual format. These are examples only and not inclusive of every scenario.

Standing Entering Session	Sessional Evaluation Outcome	Standing Entering Next Eligible Session
N/A (new student)	<60% sessional average or ,<65% in HMKN courses = Academic Probation	Academic Probation (reduced credit load requirement)
Academic Probation	Failed standing (previous Academic Probation standing with another sessional evaluation of Academic Probation	Failed standing (reduced credit load requirement 12 months later)
Failed standing (in any year of study or program)	Failed standing (previous failed session with another Sessional Evaluation of Academic Probation	Failed standing (Required to Withdraw)
Good Standing (no previous session of Academic Probation or Failed standing)	Academic Probation	Academic Probation (reduced credit load requirement)
Good Standing (with previous session of Academic Probation or Failed standing)	Failed standing - Required to withdraw	Failed standing (reviewed for future eligibility to continue)

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: Faculty of Management **Dept./Unit:** **Faculty/School Approval Date:** September 30, 2015 **Effective Session:** 2015W*	**Date:** August 1, 2015 **Contact Person:** Dr. Barbara Marcolin **Phone:** 250.807.9637 **Email:** barb.marcolin@ubc.ca

Type of Action:
Revision to Program
New/revision to courses

Rationale:
The Faculty of Management has undertaken an extensive review the last six months of the Faculty of Management Co-operative Education Program. This has included:

- Upgrading the course outlines to meet the current Senate requirements, including clarifying learning outcomes
- Restructuring the course evaluation methods to ensure a co-op placement goes above and beyond work experience. The student's first assignment includes creating learning objectives relevant to the student's career goals. As stated in the course outline, "These objectives enable students to apply their workplace learning and analyze their experience in the context of their degree program and future ambitions". A later assignment requires the student to review those learning outcomes against the set objectives, as well as a final co-op term report and performance evaluation.
- Streamlining the internal workflow processes and handbooks
- Establishing the fact that the current program is able to accommodate an extra 15 students (for a total of 45 students).

Recently, the Faculty of Management Co-op Program received accreditation from the Canadian Association for Co-operative Education (CAFCE).

For more details on CAFCE and the program review, see the document *Proposed Amendments to Management Co-op Program.*

Additionally, the program has been revised by removing the restriction allowing only Bachelor of Management students to participate. This is in anticipation of the creation of a campus-wide co-op program (see the Senate Secretariat cover memo).

* 2015W Term 2. Students are manually ("forced") registered for the Co-op courses upon confirmation of placement.

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Proposed Academic Calendar Entry:	Present Academic Calendar Entry:
	http://www.calendar.ubc.ca/okanagan/courses.cfm?go=code&code=MGCO
MGCO 401 (3) Co-op Education Work Experience I Approved and supervised **paid** work experience with a public or private organization for a minimum of 455 hours full time. **Pre-employment training** workshops **and co-op assignments are** required. Course is restricted to students who have completed all third-year requirements **and have secured a work-term with an appropriate employer either independently or through the 'Co-op Office'. Restricted to students accepted to the Management Co-operative Education Program.**	**MGCO 401 (3)** ~~Management Co-op Program I~~ Approved and supervised work experience with a public or private organization for a minimum of 455 hours full time. ~~Orientation~~ workshops. ~~Final work term report~~ required. Course is restricted to ~~Faculty of Management~~ students who have completed all third-year requirements. ~~Prerequisite: None.~~

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: Faculty of Management **Dept./Unit:** **Faculty/School Approval Date:** September 30, 2015 **Effective Session:** 2015W*	**Date:** August 1, 2015 **Contact Person:** Dr. Barbara Marcolin **Phone:** 250.807.9637 **Email:** barb.marcolin@ubc.ca

Type of Action:
Revision to Program
New/revision to courses

Rationale:
The Faculty of Management has undertaken an extensive review the last six months of the Faculty of Management Co-operative Education Program. This has included:

- Upgrading the course outlines to meet the current Senate requirements, including clarifying learning outcomes
- Restructuring the course evaluation methods to ensure a co-op placement goes above and beyond work experience. The student's first assignment includes creating learning objectives relevant to the student's career goals. As stated in the course outline, "These objectives enable students to apply their workplace learning and analyze their experience in the context of their degree program and future ambitions". A later assignment requires the student to review those learning outcomes against the set objectives, as well as a final co-op term report and performance evaluation.
- Streamlining the internal workflow processes and handbooks
- Establishing the fact that the current program is able to accommodate an extra 15 students (for a total of 45 students).

Recently, the Faculty of Management Co-op Program received accreditation from the Canadian Association for Co-operative Education (CAFCE).

For more details on CAFCE and the program review, see the document *Proposed Amendments to Management Co-op Program.*

Additionally, the program has been revised by removing the restriction allowing only Bachelor of Management students to participate. This is in anticipation of the creation of a campus-wide co-op program (see the Senate Secretariat cover memo).

* 2015W Term 2. Students are manually ("forced") registered for the Co-op courses upon confirmation of placement.

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Proposed Academic Calendar Entry:	Present Academic Calendar Entry:
	http://www.calendar.ubc.ca/okanagan/courses.cfm?go=code&code=MGCO
MGCO 402 (3) Co-op Education Work Experience I	**MGCO 402 (3) Management Co-op Program I**
Approved and supervised **paid** work experience with a public or private organization for a minimum of 455 hours full time. **Pre-employment training** workshops **and co-op assignments are** required. Course is restricted to students who have completed all third-year requirements **and have secured a work-term with an appropriate employer either independently or through the 'Co-op Office'. Restricted to students in the Management Co-operative Education Program.** **Prerequisite: MGCO 401.**	Approved and supervised work experience with a public or private organization for a minimum of 455 hours full time. ~~Orientation~~ workshops. ~~Final work term report~~ required. Course is restricted to ~~Faculty of Management~~ students who have completed all third-year requirements. ~~Prerequisite: 401.~~

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: Faculty of Management **Dept./Unit:** **Faculty/School Approval Date:** September 30, 2015 **Effective Session:** 2015W*	**Date:** August 1, 2015 **Contact Person:** Dr. Barbara Marcolin **Phone:** 250.807.9637 **Email:** barb.marcolin@ubc.ca
Type of Action: Revision to Program New/revision to courses	

Rationale:

The Faculty of Management has undertaken an extensive review the last six months of the Faculty of Management Co-operative Education Program. This has included:

- Upgrading the course outlines to meet the current Senate requirements, including clarifying learning outcomes
- Restructuring the course evaluation methods to ensure a co-op placement goes above and beyond work experience. The student's first assignment includes creating learning objectives relevant to the student's career goals. As stated in the course outline, "These objectives enable students to apply their workplace learning and analyze their experience in the context of their degree program and future ambitions". A later assignment requires the student to review those learning outcomes against the set objectives, as well as a final co-op term report and performance evaluation.
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Proposed Academic Calendar Entry:	Present Academic Calendar Entry:
	http://www.calendar.ubc.ca/okanagan/courses.cfm?go=code&code=MGCO
MGCO 403 (3) Co-op Education Work Experience I Approved and supervised **paid** work experience with a public or private organization for a minimum of 455 hours full time. **Pre-employment training** workshops **and co-op assignments are** required. Course is restricted to students who have completed all third-year requirements **and have secured a work-term with an appropriate employer either independently or through the 'Co-op Office'. Restricted to students in the Management Co-operative Education Program.** **Prerequisite: MGCO 402.**	**MGCO 403 (3)** ~~Management Co-op Program I~~ Approved and supervised work experience with a public or private organization for a minimum of 455 hours full time. ~~Orientation~~ workshops. ~~Final work term report~~ required. Course is restricted to ~~Faculty of Management~~ students who have completed all third-year requirements. ~~Prerequisite: 402.~~

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: Faculty of Management **Dept./Unit:** **Faculty/School Approval Date:** September 30, 2015 **Effective Session:** 2015W*	**Date:** August 1, 2015 **Contact Person:** Dr. Barbara Marcolin **Phone:** 250.807.9637 **Email:** barb.marcolin@ubc.ca

Type of Action:
Revision to Program
New/revision to courses

Rationale:

The Faculty of Management has undertaken an extensive review the last six months of the Faculty of Management Co-operative Education Program. This has included:

- Upgrading the course outlines to meet the current Senate requirements, including clarifying learning outcomes
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Proposed Academic Calendar Entry:	Present Academic Calendar Entry:
	http://www.calendar.ubc.ca/okanagan/courses.cfm?go=code&code=MGCO
MGCO 404 (3) Co-op Education Work Experience I Approved and supervised **paid** work experience with a public or private organization for a minimum of 455 hours full time. **Pre-employment training** workshops**, and co-op assignments are** required. Course is restricted to students who have completed all third-year requirements **and have secured a work-term with an appropriate employer either independently or through the 'Co-op Office'. Restricted to students in the Management Co-operative Education Program. Prerequisite: MGCO 403.**	**MGCO 404 (3)** ~~Management Co-op Program I~~ Approved and supervised work experience with a public or private organization for a minimum of 455 hours full time. ~~Orientation~~ workshops.~~Final work term report~~ required. Course is restricted to ~~Faculty of Management~~ students who have completed all third-year requirements. ~~Prerequisite: 403.~~

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Fax 250.807.8007
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November 13, 2015

To: Okanagan Senate

From: Curriculum Committee and Admissions and Awards Committee Joint

Subject: Report Curriculum and Admissions Proposals (approval)
                 – Master of Science in Computer Science
                 - Master of Engineering Leadership (M.E.L.) in Resource Engineering
                 Management

The Curriculum Committee and the Admissions & Awards Committee have reviewed the material forwarded to it by the Faculty of Arts and Sciences and the Faculty of Applied Science and encloses those proposals it deems ready for approval.

As such, the following is recommended to Senate:

Motions: *That Senate approve and recommend to the Board of Governors for approval the new Master of Science in Computer Science program and the associated new and revised courses brought forward from the Faculty of Arts and Sciences*

                 That Senate approve Master of Engineering Leadership in Resource Engineering Management and the associated new and revised courses brought forward by the Faculty of Applied Science.

a. From the Faculty of Arts and Sciences
   i. New Courses
      a. COSC 442 (3) Mobile Educational Game Development

      b. COSC 542 (3) Mobile Educational Game Development

      c. COSC 504 (3) Database System Implementation

      d. COSC 505 (3) Modeling and Simulation

      e. COSC 506 (3) Numerical Optimization

      f. COSC 507 (3) Parallel Computing

      g. COSC 516 (3/6) d Special Topics in Databases

      h. COSC 519 (3/6) d Topics in Computer Science

i. COSC 520 (3) Advanced Algorithms

j. COSC 522 (3) Advanced Topics in Artificial Intelligence

k. COSC 541 (3) Advanced Human Computer Interaction

l. COSC 548 (3) Directed Studies

m. COSC 549 (12) Master's Thesis

n. COSC 550 (6) Master's Project

o. COSC 589 (3) Master's Essay

p. COSC 590 (1-3) d Graduate Seminar

q. DATA 521 (3) Network Science

r. DATA 421 (3) Network Science

s. DATA 500 (3) Communication and Consulting in Data Science

t. DATA 501 (3) Data Analytics

u. STAT 507 (3) Sampling and Design

ii. Revised Courses

a. COSC 404 (3) Database System Implementation

b. COSC 405 (3) Modelling and Simulation

c. COSC 406 (3) Numerical Optimization

d. COSC 407 (3) Introduction to Parallel Computing

e. COSC 416 (3-9) d Special Topics in Databases

f. COSC 419 (3-9) d Topics in Computer Science

g. COSC 320 (3) Analysis of Algorithms

h. COSC 322 (3) Introduction to Artificial Intelligence

i. COSC 341 (3) Human Computer Interaction

j. STAT 400 (3) Statistical Communication and Consulting

k. DATA 301 (3) Introduction to Data Analytics

l. STAT 407 (3) Sample Surveys

iii. New M.Sc. Computer Science Calendar pages, sections:
a. Program Overview
b. Admissions Requirements
c. Program Requirements
d. Contact Information

b. From the Faculty of Applied Science
    i.   New Courses (Master of Engineering Leadership)
          a. ENGR 514 (3) Regulatory and Societal Issues for Resource Engineers

          b. ENGR 517 (3) Pipeline Integrity Assurance and Risk Assessment

          c. ENGR 530 (3) Analysis and Mitigation of Geohazards

          d. ENGR 544 (3) Life Cycle Assessment and Management

          e. ENGR 570 (3) Professional Resource Engineering Project

          f. ENGR 578 (3) Corrosion Science for Resource Engineers

          g. ENGR 588 (3) Process Engineering

          h. APPP 501 (1.5) Projecte Management and Leadership

          i. APPP 502 (1.5) Sustainability and Leadership

          j. APPP 503 (1.5) Organizational Leadership

          k. APPP 504 (3) Business Acumen for Technical Leaders

          l. APPP 507 (1.5) Professional Communication

          m. APPP 515 (3) Reliability Engineering and System Safety

    ii.   New Subject Code

          a. APPP – Applied Science Professional Platform

    iii. Revised Courses

          a. ENGR 515 (3) Reliability Engineering and System Safety

          b. ENGR 415 (3) Reliability Engineering and System Safety

    iv.   New M.E.L. Calendar pages, sections:
          a. Program Overview
          b. Admissions Requirements
          c. Program Requirements

For the Committees,

Dr. Peter Arthur
Chair, Curriculum Committee

Executive Summary for a New Degree Program Proposal
Master of Science in Computer Science

Faculty of Arts and Sciences

University of British Columbia – Okanagan (UBCO)

Overview

The University of British Columbia is a comprehensive research-intensive university, consistently ranked among the 40 best universities in the world. It creates an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada and the world. Since 1915, UBC's West Coast spirit has embraced innovation and challenged the status quo. Its entrepreneurial perspective encourages students, staff and faculty to challenge convention, lead discovery and explore new ways of learning.

The Faculty of Arts & Sciences (the I. K. Barber School of Arts & Sciences) was established in 2005. It is organized into 8 units with 150 faculty members who offer 14 majors in the BA and 16 majors in the BSc in addition to 4 interdisciplinary majors. In 2014, the faculty offered courses to more than 3700 full-time equivalent students. The department of Computer Science on the UBC Okanagan campus is part of Unit 5, which contains Computer Science, Mathematics, Physics, and Statistics.

Faculty members in Computer Science, Statistics, and Mathematics have been offering graduate degrees as Master of Science in Interdisciplinary Graduate Studies (IGS) for many years. Unit 5 now proposes to offer a Master of Science in Computer Science (COSC MSc) graduate program. The program targets traditional Computer Science students, students who wish to pursue studies in optimization, and students interested in data science.

Computer Science graduate programs are in very high demand (see v below) for they train students for employment in fast growing fields of software development, information technology, and data science. The proposed Master of Science in Computer Science program will attract graduate students in these high-demand fields and offer them high-quality education.

Credentials

MSc in Computer Science.

Location: The Okanagan campus of UBC.

Faculty offering program

The program will be offered in the Faculty of Arts & Sciences by the Department of Computer Science in collaboration with faculty members in the Department of Statistics for the data science focus of the program and in the Department of Mathematics for the optimization component.

Anticipated program start date

The program will be offered starting in the 2016W academic year.

Anticipated completion time:

The thesis-based option may take up to two years to complete. The project-based option may be completed in 12-18 months.

Summary of the proposed program

There are two options available to students in the MSc in Computer Science:

1. Thesis option: 18 credits of coursework, plus a 12-credit MSc thesis;
2. Project option: 24 credits of coursework, plus a 6-credit MSc project;

i.　　Aims, goals and/or objectives of the proposed program

The proposed MSc in Computer Science aims at training graduate students who wish to either work in industry or continue their studies toward a Ph.D. program. Its specific goals are as follows.

- ✓ **Increased visibility:** The MSc in Computer Science will greatly increase the visibility of the graduate program compared with the current IGS program that is confusing because of the extremely broad range of disciplines it includes.
- ✓ **Broader recognition:** Very successful students have completed an MSc in IGS. However, we have repeatedly received feedback that students prefer the more widely recognized MSc in Computer Science degree name, which resonates more with employers. For the majority of students, their studies are within the domain of Computer Science, and labeling their degree as IGS diminishes its value to employers. The Computer Science name is so important that some students only apply to institutions that offer a graduate program in Computer Science, while others chose to graduate with an MSc in mathematics instead of in IGS.
- ✓ **High demand:** an MSc in Computer Science is expected to generate increased number of applications with much less advertising effort than the current IGS program since training in computer science is in high demand: 5 of the top 30 best jobs for 2014 and 5 of the top 20 best paying jobs for women require computer science training (See Section v).
- ✓ **Increased quality:** The MSc in Computer Science reinforces a commitment to a research-intensive institution with significant economic and community impact. The two options clarify students' objectives and allow more explicit evaluation of the learning objectives. Graduate supervision by Computer Science faculty members has been a great success story: 13 graduates, 3 NSERC award winners, and 1 Governor General's Gold Medal winner. COSC faculty members have a solid track record of research funding through both academic and industrial grants to pay competitive graduate student salaries.
- ✓ **Inclusion of new subfield: Data Science:** The MSc program in Computer Science will capture fields currently recognized within our Unit (Computer Science and Optimization) but also include the fast-growing field of data science. In effect, it is a consolidation of Unit 5 faculty members' expertise into a well-recognized program name.
- ✓ **Leveraging faculty research expertise:** While the MSc degree is a general degree in computer science, the research strengths of the faculty members in the unit will cater to three distinct populations of students. The first group consists of students interested in traditional computer science disciplines such as artificial intelligence, algorithms, databases, and computer science education. The second group of students is interested in optimization and will acquire a background at the boundary between computer science and mathematics. The last group has interest in data science, which is at the boundary between computer science and statistics. All three groups will have their place in the proposed MSc in Computer Science program.
- ✓ **Economic impact:** The MSc in Computer Science will also increase the economic impact of our alumni. Past alumni in the IGS MSc program were international students. They remained in Canada and found employment immediately after graduation in companies such as Microsoft Corp., Amazon.com Inc., and Autodesk Inc (see Appendix). The new program offers options specifically targeted at students who wish to work in industry (the project-based option), and is expected to be very attractive to international and national students.

ii.　　Anticipated contribution to the mandate and strategic plan of the institution

The program will strengthen UBC's commitment to an exceptional learning environment. It will support UBC's commitment to research excellence by expanding the recruitment of top graduate students with a recognized degree name, and high standards of excellence. Faculty members have a strong commitment to technology transfer with a proven track record of multiple industry sponsored grants that provide excellent opportunity for graduate students funding as well as dream job opportunities. The program will enhance UBC's support for innovation in the Interior.

The program also reinforces UBC's student learning commitment by simplifying and streamlining the current IGS program: computer science students will have the option to complete an MSc in Computer Science instead of being limited to interdisciplinary research.

iii.　Program learning outcomes

The learning outcomes are slightly different for each option of the program

- After completing a thesis-based MSc in Computer Science, students will be able to
  - demonstrate a solid foundation in core computer science subfields: artificial intelligence, databases, data structure, parallel computing, programming, software engineering
  - summarize the literature on a specific research question
  - investigate a specific research question
  - present and defend their results publicly
  - present their results in writing following standard scientific writing practices
  - analyze current trends in computer science, and anticipate upcoming technological challenges

  These students will be well-prepared to continue their studies toward a Ph.D.
- After completing a project-based MSc in Computer Science, students will be able to
  - demonstrate practical computer science skills such as software engineering through the implementation of a significant piece of software
  - present, explain and critique their project, usually a significant software, and advertise it as their portfolio
  - exhibit a wide breadth of knowledge in computer science
  - analyze current trends in computer science, and anticipate upcoming technological challenges

  Students completing their project will be well positioned to find positions in the industry and will use their completed project as a portfolio item.

iv.　Linkages between the learning outcomes and the curriculum design, including an indication whether a work experience/work place term is required for degree completion; and if so, a description of the purpose and role of the work experience within the program

No work experience/work place term is included in the program. The project-based option is expected to target community needs similar to - but more advanced than - current projects developed in the COSC 499 Capstone project and the COSC 341 Human-Computer Interaction courses. Our graduate students have been funded by Industry-sponsored grant and we plan to continue technology transfers in the proposed program.

The learning outcomes of the thesis-based option include an up-to-date knowledge of the latest contributions in the field, solid skills in scientific writing and the ability to express technical ideas clearly. Students learn these skills by taking the seminar course COSC 490 three times; the thesis and its defense provide a rigorous evaluation. The knowledge of the state of the art requires in the project-based option is provided through the different graduate courses that are carefully selected to relate to the project considered.

v.　Potential areas/sectors of employment for graduates and/or opportunities for further study

Students graduating from the program will have the opportunity to pursue graduate studies at the PhD level elsewhere (thesis option), or enter the industry (project option).

A graduate degree in Computer Science provides students with training and skills that lead to well-paying jobs. The median income for an undergraduate in Computer Science is over $70,000, and graduate training can increase this amount by ten to twenty thousand dollars. Without a formal program or any marketing, our IGS program attracts between ten and twenty applicants per year including high-quality international applicants. The number of students accepted is limited primarily by faculty time for supervision.

As evidence of job opportunities, the 20 Best-Paying Jobs for Women in 2014
(http://www.forbes.com/sites/kathryndill/2014/03/14/top-20-best-paying-jobs-for-women-2014/) include

- #4 Computer and Information System Manager ($80K/year),
- #8 Software Developers ($71K/year),
- #10 Operation Research Analyst ($68K/year),
- #16 Computer System Analysts ($63K/year),
- #19 Computer Programmers ($60K/year).

Moreover, the best jobs of 2014 (http://www.careercast.com/jobs-rated/best-jobs-2014) include

- #7 Software Engineer ($93K/yr),
- #8 Computer System Analyst ($80K/yr),
- #19 Computer System Administrator ($73K/yr),
- #26 Computer Programmer ($74K/yr),
- #28 Web Developer ($63K/yr).

vi. Delivery methods

The program will be delivered using a variety of methods. From traditional lectures complemented with laboratory assignments to flipped classroom flexible delivery models such as team-based learning. Some theses have been industry-sponsored in the past with matching funds provided by MITACS (Accelerate program) or NSERC (Engage and Collaborative Research and Development programs). The project-based option will have a strong potential for industry sponsoring. Such experience-based learning is encouraged but not mandatory in the present program.

vii. Program strengths

By having 2 options the program offers a flexible degree that addresses a wide range of student needs. The thesis option leverages the strong research focus of our department and targets students who wish to continue toward a PhD. The project option focuses on students who are interested in entering the industry with a strong portfolio. The multidisciplinary character of Unit 5 makes it easy to co-supervise students in Computer Science with interest in Mathematics (Optimization) or Statistics (Data Science).

viii. An overview of the level of support and recognition from other post-secondary institutions, (including plans for admissions and transfer within the British Columbia post-secondary education system) and relevant regulatory or professional bodies, where applicable

The MSc in computer science program will be accepted as a pre-requisite for PhD programs in North America.

ix. Related programs in the institution or other British Columbia post-secondary institutions. Indicate rationale for duplication, if any.

UBC Vancouver department of Computer Science (CPSC) offers an MSc in Computer Science in a similar format. The CPSC and COSC departments have different research expertise and so offer slightly different courses. The geographical distance justifies having a program that follows the same structure on our campus.

The current MSc in IGS program has been an incubator for an MSc in Computer Science in some cases. But the focus of the IGS MSc program is inherently interdisciplinary while the COSC MSc program is solidly anchored in computer science sometimes with applications in another discipline like statistics, mathematics, or even civil engineering (optimization of road designs). So the programs have significantly different goals, and the present proposal will enhance the quality of the IGS MSc program by refocusing it to its core interdisciplinary mandate.

The name, title, phone number and email address of the institutional contact person in case more information is required.

Dr. Yves Lucet, Professor, Computer Science,

I. K. Barber School of Arts & Sciences Unit #5, UBC Okanagan

ASC 350, 3187 University Way, Kelowna BC V1V 1V7

yves.lucet@ubc.ca   250.807.9505

Appendix: Resources required

The following is a brief description of the resources that will be required for the program.

i. Budget (including proposed tuition fee)

Since the MSc in Computer Science program already exists at UBC Vancouver, tuition will be the same as what UBC currently charges for that program, which is the same as for the MSc IGS program. Otherwise, there is no additional budget needed considering the MSc in IGS is currently being delivered, and the new program will share the same resources.

ii. Space

Research laboratory for thesis-based graduate students are already established, and have been used to supervise graduate students in the IGS program. These include the CFI-funded laboratories: CA^2 (Computer-Aided Convex Analysis) laboratory in ASC 303 of Dr. Yves Lucet, the Distributed Database Laboratory in ASC 304 of Dr. Ramon Lawrence, the Environmetrics Research Laboratory in ASC 305-306 and the Signals laboratory in ASC 334A of Dr. Jason Loeppky. The project-based option does not require research space.

Computer lab space for delivering courses is already available on campus to deliver undergraduate courses, and no new space is required to allocate the anticipated number of students.

iii. Library

Current library subscriptions are sufficient to support the program.

iv. Other: Faculty Resources

Computer Science currently has 7 faculty members including four tenured professors, one tenure-track instructor, and two term instructors. Our group is dynamic, motivated, and proven. We have 2 CFI-funded labs, 3 NSERC award holders (with 2 recent renewals), 1 SSHRC holder, and 4 faculty members with a track record of industrial funding including NSERC Engage/CRD, and MITACS Accelerate/GlobaLink grants. Our students are funded by research and industrial projects that provide training and real-world experience for future careers.

To this point, almost all graduate courses have been either cross-listed 4th-year courses or individualized directed studies. The current proposal for an MSc program does not request new resources for teaching graduate courses and develops a plan to enrich curriculum of both undergraduates and graduates by targeting courses that are of value to both. Most of these courses already exist and will be extended for the graduate program. Adding 5th-year courses to the calendar will increase significantly the visibility of the program at no cost since these courses are already currently offered as Special Topics or Directed Studies.

Our undergraduate program is growing and stable. The recent instructor hire has provided the flexibility to handle leaves and absences. Our faculty has a passion for teaching and has built a quality program.

Our graduate students are funded. Many students are funded on industrial research projects or internships with organizations like B.C. Cancer Agency. All professors have external funding for student support. The discipline has more demand for GTAs than people to fill the positions. Although funding is always a critical issue, it is not the limiting factor for the proposed MSc program. This program will be successful if at minimum our current allotment of GTAs continues.

The undergraduate course enrolment in Computer Science is 1100 course registrations[1] equivalent to 110 FTEs with about 8-10 graduates in past years and 22 graduates in 2015. Figure 1 and Table 1 show the growth in Computer Science course registrations over the years. The 10-year overall growth is 190%, which is above the growth in enrolment in Mathematic courses (115%) and Physics (140%). The growth of the undergraduate program has caused a major issue with finding qualified TAs. Over 50% of our TAs are undergraduates, and we do not have enough applicants for GTAs. The MSc program will allow us to recruit more graduate students and fund them as GTAs. This will improve the educational experience for undergraduate students.
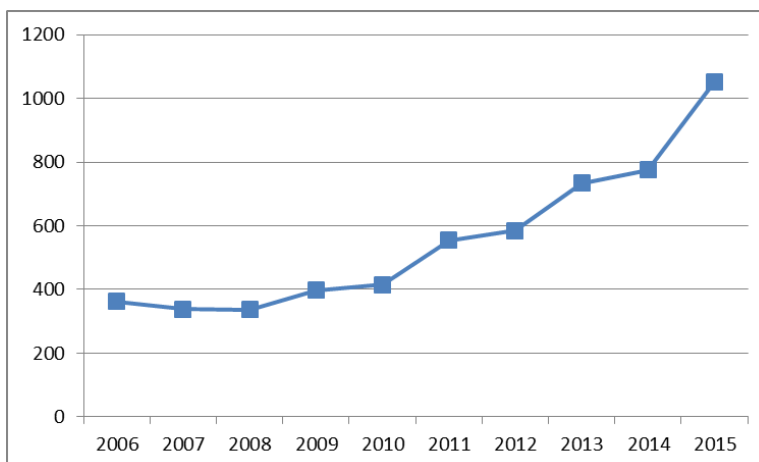

Figure 1: Number of students registered in COSC courses from 2007 to 2014

Table 1: Number of students registered in COSC courses from 2007 to 2014

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Course registrations	362	338	337	397	415	555	585	733	776	1050
Year to year Growth		-7%	0%	18%	5%	34%	5%	25%	6%	35%

Appendix: Historical Graduate Enrollments

IGS intake was 38 students in 2007-14 with 29 students having a supervisor in Computer Science and 9 in either Statistics or Mathematics. Tables 2 and 3 show the breakdown per year for students with a Computer Science supervisor.

Table 2: Program intake per year

	2007	2008	2009	2010	2011	2012	2013	2014	Total
MSc	2	3		4	4	5	3	3	24
PhD			1	2	0		2		5
							Total accepted		29

Table 3: Program output per year

	2007	2008	2009	2010	2011	2012	2013	2014	Total
Graduated		1	1	2	0	2	5	3	14
Withdrew						2	2		4
							In program		11
						Total graduated + withdrew			29

---

[1] Update: As of 2015-09-03 the number of registrations was 1397.

Appendix: Alumni Employment

The next table shows the graduation year, current employers and awards of students supervised by Computer Science faculty members at UBC Okanagan. (Student names were withheld for privacy reasons.)

Graduated	Current Employer	Award
	PhD student UBCO	NSERC 2010 Postgraduate Scholarships - Doctoral
2014	Software engineer at Diamond Municipal (Kelowna)	NSERC 2013 Alexander Graham Bell Canada Graduate Scholarships
2014	Junior Developer at Akuna Capital	
2014	Programmer at Navigator Multimedia Inc	
2013	Interaction Designer at Global Relay	
2013	Programmer Analyst at Interior Health Authority	
2013	Software Development Engineer at Amazon	
2013	Programmer at Two Hat Security	NSERC 2009 Alexander Graham Bell Canada Graduate Scholarships
2013	Software Engineer in government organization	
2012	Associate Software Engineer at EMC	
2012	Software Engineer at Microsoft	
2010	Principal Research Engineer, Autodesk, Inc.	2010 Governor General's Academic Gold Medal, 2008 Pacific Century Graduate Scholarship
2010	PhD student UBCO	NSERC 2008 Alexander Graham Bell Canada Graduate Scholarships
2009	Senior Software Engineer at Two Hat Security	
2008	Lead Data Mining/Analytics Devel., QuickMobile	

The following students were co-supervised at UVic and partially funded by COSC faculty members (Dr. Y. Gao)

Graduated	Current Employer
2011	Principle software engineer, Hubble Connected Ltd
2010	Software engineer, Google

Appendix: Number of students graduated in MSc programs at UBC Okanagan

The following table shows that the expected enrolment in the proposed MSc in Computer Science will at least be similar with other programs at UBC Okanagan.

	2008	2009	2010	2011	2012	2013	2014	2015	Total
Supervised by COSC faculty members	1	1	2	0	2	5	3		**14**
Discipline									
Biochemistry and Molecular Biology	0	0	0	0	0	0	2	1	**3**
Biology	1	3	4	3	6	6	10	4	**37**
Chemistry	0	0	2	2	1	4	2	0	**11**
Environmental Sciences	1	0	3	1	4	2	3	1	**15**
Interdisciplinary Studies-Health & Exercise	0	0	0	0	1	1	5	1	**8**
Interdisciplinary Studies-Optimization	0	0	0	0	0	0	2	3	**5**
Interdisciplinary Studies	5	1	1	4	6	2	5	2	**26**
Mathematics	0	0	4	3	2	2	3	1	**15**
Total	**7**	**4**	**14**	**13**	**20**	**17**	**32**	**13**	**120**

Program Overview of MSc in Computer Science

Graduate students with interest in Computer Science currently participate in the IGS individual program. As an individualized program, each student has a customized program plan developed which typically consists of numerous directed studies courses taught by members of the supervisory committee. This results in less choice and diversity for students and a significant amount of individually supervised activities. Although students still receive quality training through this program, the program itself restricts the student experience and the number of students that can be supervised.

Another group of students supervised by faculty members in Computer Science chooses the Optimization theme of the IGS program. (Optimization has been a recognized strength of the unit for many years: Unit 5 is home of a CRC in convex analysis and optimization, Dr. Heinz Bauschke, and of the Centre for Optimization Convex Analysis and Nonsmooth Analysis.) While the theme provides greater recognition than the individual program and has a visible list of courses[1], the program can be improved further by formalizing the course selection available to students thereby reducing student confusion and faculty workload. With the approval of an MSc in Computer Science, future optimization students would have the choice between an MSc in Mathematics, Computer Science, or IGS.

One objective of the current proposal is to broaden our program offering and increase the quality of our program. Depending on their background and career objective, students will be able to choose to complete an MSc in Computer Science, Mathematics, or IGS. Each program enforces specific requirements that increase the quality of the program. It is expected that most students who currently are supervised by Computer Science faculty members in the MSc IGS program (see Appendix) will select the MSc in Computer Science program in the future for its broader recognition and emphasis on computer science skills. Students supervised by statistics faculty members will have the option of a much applied computer oriented program (the MSc in Computer Science) or a more theoretical program (the MSc in Mathematics).

The MSc in Computer Science (MSc COSC) follows a similar structure as the MSc in Computer Science at the UBC Vancouver campus (MSc CPSC). It includes 2 options:

1. Thesis option: 18 credits of coursework, plus a 12-credit MSc thesis requiring a written thesis, and a public defense.
2. Project option: 24 credits of coursework, plus a 6-credit MSc project requiring a written report and a public presentation.

Based on the expertise of faculty members at UBCO, the program serves students interested in traditional Computer Science (Artificial Intelligence, Algorithms, Databases, and Computer Science Education), in Optimization, and in Data Science.

Faculty members supporting the program

The following faculty members with experience in graduate supervision in the IGS program will support the program.

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[1] http://ikbsas.ok.ubc.ca/programs/optimization.html

Name	Rank	Cluster	Recent Funding	Research Expertise
Yong Gao	Associate Professor	Computer science, Optimization,	DG	Artificial Intelligence, Algorithms
Warren Hare	Associate Professor	Optimization	DG, CRD, Engage, Accelerate	Optimization, nonconvex analysis
Patricia Lasserre	Associate Professor	Computer science	Accelerate	Computer vision, Human-Computer interaction, computer science education
Ramon Lawrence	Associate Professor	Computer science	DG	Databases, algorithms, innovative teaching systems
Yves Lucet	Professor	Optimization, Computer science	DG, CRD, Engage, Accelerate	Optimization, convex analysis, algorithms, computer science education
Jason Loeppky	Associate Professor	Data Science	DG, CRD, Engage	Design and analysis of experiments for physical processes and computer-based simulations
John Braun	Professor	Data Science	DG, CANSSI	Computational Statistics, statistical education
Paramjit Gill	Associate Professor	Data Science		Spatial statistics; sports statistics; statistical stylometry; and social networks models
Bowen Hui	Instructor[2]	Computer Science	SSHRC	Computer Science education, intelligent interfaces, probabilistic reasoning, computational linguistics

Abbreviations: DG (NSERC Discovery Grant), CRD (NSERC Collaborative Research and Development grant), Engage (NSERC Engage grant), Accelerate (MITACS Accelerate grant), CANSSI (Canadian Statistical Sciences Institute).

Admission Requirements

General admission requirements stipulated by the College of Graduate Studies (CoGS) must be satisfied. Applicants are normally required to hold a bachelor's degree in computer science or a related field.

Students are admitted within a specific option: thesis-based, or project-based. Students will have the opportunity to move to a different option during their degree by submitting an application to the program coordinator who will verify that the appropriate learning environment (e.g. supporting supervisory committee) is in place to maximize the student probability of success in their new option.

Completion Requirements

To complete the program, the student must successfully pass (as per CoGS minimum grade requirements) 18 credits (respectively 24) and successfully defend his/her master's thesis (respectively master's project). CoGS maximum degree duration and similar rules apply.

Course Selection

The supervisory committee proposes a program plan to the graduate coordinator for approval.

Option	Option	Courses	Note
Thesis	12-credit thesis COSC 549	• 18 credits of courses numbered 500 and above • at least 9 credits in COSC not including COSC 590 • no more than 6 credits outside COSC and DATA	• 6 credits of undergraduate courses numbered 300-499 can be substituted for 6 credits of graduate courses;
Project	6-credit project	• 24 credits of courses numbered 500 and above	

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[2] CoGS approved Bowen involvement in the program by email on April 23, 2015.

	COSC 550	• at least 9 credits in COSC not including COSC 590 • no more than 9 credits outside COSC and DATA	• the course plan has to be approved by the supervisory committee and the program coordinator to determine whether the combination of courses warrants the granting of a MSc in Computer Science.

In practise, faculty member expertise falls into 3 clusters: general Computer Science, Optimization, and Data Science. A student interested in a thesis-based option in

- Optimization is advised to take COSC 590 three times, MATH 563, and MATH 604 (Special topic related to Optimization);
- Data Science is advised to take DATA 501, 521, STAT 507, and COSC 504, 522, 541.

Examples of program plans[3] include

Option	Computer Science	Optimization	Data Science
Thesis COSC 549	COSC 504, 507, 520, 522, 541; COSC 590 (x3)	COSC 506, 507, 520, MATH 563, 604; COSC 590 (x3)	DATA 501, 521, STAT 507, 538 COSC 504, 541
Project COSC 550	+DATA 521, COSC 542	+DATA 501, COSC 505	+COSC 507, 522

Any course not listed below must be pre-approved by the program committee before it is included in a course plan. All course plans need to be approved even when only including courses listed below.

Table: Thesis, project, essay, and practicum courses.

Course	Title
COSC 549 (12)	Thesis [Pass/Fail]
COSC 550 (6)	Project [Pass/Fail]
COSC 589 (3)	Essay [Pass/Fail]
DATA 500 (3)	Consulting

Table: COSC courses.

Course	Credits	Title	Note
COSC 504	3	Database System Implementation	
COSC 505	3	Modeling and Simulation	
COSC 506	3	Numerical Optimization	
COSC 507	3	Parallel Computing	
COSC 516	3/6 d	Special Topics in Databases	
COSC 519	3/6 d	Topics in Computer Science	Can be taken twice
COSC 520	3	Advanced Algorithms	
COSC 522	3	Advanced Artificial Intelligence	

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[3] Special topic courses provides additional choices but are not proposed since they are by definition not regularly scheduled.

3

COSC 541	3	Advanced Human Computer Interaction	
COSC 542	3	Mobile Educational Game Development	
COSC 548	3	Directed Studies	
COSC 590	1-3 d	Graduate Seminar	

Table: DATA courses

Course	Credits	Title
DATA 501	3	Introduction to Data Science
DATA 521	3	Network Science

Table: STAT courses

Course	Credits	Title
STAT 507	3	Sampling and Design
STAT 538	3	Advanced Statistical Modelling
STAT 547	2-15d	Topics in Statistics [max 6 credits (take twice) will be granted for this course]

Table: Graduate courses not requiring pre-approval[4]

Course	Credits	Title
CPSC 5xx/6xx	3	(Any 5th or 6th year course offered by UBC Vancouver computer science department)
ENGR 502	3	Technical Communication for Engineering Research
MATH 523	3	Combinatorial Optimization
MATH 555	3	Theory of Error-Correcting Codes
MATH 563	3	Convex Optimization and Nonsmooth Analysis
MATH 570	1-3	Optimization and Analysis I
MATH 604	2-15c	Topics in Optimization [max 6 credits (take twice) will be granted for this course]
MATH 670	1-3	Optimization and Analysis II

Course offerings

Each year, COSC will offer COSC 506 or 507, COSC 520, COSC 541, COSC 522 or DATA 521, and COSC 590 (4 times a year). COSC 504 and COSC 542 are scheduled every other year. Other courses (COSC 505, 516, 519, and 548) are scheduled on a case-by-case basis. The offerings for DATA will be a yearly offering of DATA 501, and an alternate year offering of DATA 521. Mathematics offers MATH 563, 604, and one other course (MATH 523, 555, 570, or 670) each year while Statistics offers STAT 538, 547 each year and STAT 507 every other year. Consequently, the program offers yearly 6 COSC courses, 1.5 DATA courses, 3 MATH courses, and 2.5 STAT courses. Hence, we will offer more than the minimum of 24 credits required, which give students options in their choice of courses.

Here is a summary of the courses proposed including their relationship with undergraduate courses; the table makes it clear that no new faculty hiring is required to implement the program.

#	Course	Credits	Title	Cross	Note

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[4] The program plan still requires approval.

			listed		
1	COSC 549	12	Thesis		
2	COSC 550	6	Project		
3	COSC 589	3	Essay		
4	DATA 500	3	Consulting	STAT 400	
5	COSC 504	3	Database System Implementation	COSC 404	
6	COSC 505	3	Modeling and Simulation	COSC 405	
7	COSC 506	3	Numerical Optimization	COSC 406	
8	COSC 507	3	Parallel Computing	COSC 407	
9	COSC 516	3/6d	Special Topics in Databases	COSC 416	
10	COSC 519	3/6d	Topics in Computer Science	COSC 419	Sample: Computational Geometry
11	COSC 520	3	Advanced Algorithms	COSC 320	
12	COSC 522	3	Advanced Artificial Intelligence	COSC 322	
13	COSC 541	3	Advanced Human Computer Interaction	COSC 341	
14	COSC 548	3	Directed Studies [same as CPSC 548]		Sample: Parametric Linear/Quadratic programming
15	COSC 590	1-3	Graduate Seminar		
16	DATA 501	3	Introduction to Data Science	DATA 301	
17	STAT 507	3	Sampling and Design	STAT 407	
18	STAT 538	3	Advanced Statistical Modelling		Already in calendar
19	STAT 547	3	Special Topic in Statistics		Already in calendar
20	DATA 521	3	Network Science	COSC 421	
21	COSC 542	3	Mobile Educational Game Development	COSC 442	

Video conferencing

Unit 5 has been exploring video conferencing options. We are ready to start in 2015-16 such a partnership with the University of Western Ontario (UWO) and Simon Fraser University (SFU); see letters of support attached. The framework requires a professor at a host institution to video stream their lectures and share their course material (including exams) with a professor at a receiving institution. Students are registered in their respective institutions and attend lectures live (if their institution is host) or via video conference (if their institution is receiving). Labs and assignments are graded by the local TA (if any) and professor. Consequently, the professor at the host institution has no additional work beyond setting up the video stream and sharing his/her course material, while the professor at any receiving institution has less work than teaching a full course but more than teaching a cross-listed course. The students benefit by having access to a wider range of courses while also having a local professor available to provide any support, grade, and give additional feedback.

The current framework does not require formal agreements since in practise the UBCO professor creates a special topic course COSC 519. (S)He is fully responsible for the delivery, marking, and similar duties as for any course taught at UBCO. The professor then decides to use video lectures provided by another institution, and to use or adapt evaluation material. (S)he is fully available to answer students' questions, is responsible for marking, grade posting, etc. This is similar to what some of us are doing when we use publicly available content provided by MOOCs. It allows us to deliver cutting edge content selected by an expert in the field. The setup for the video courses explicitly identify the source of these courses, and let student know their availability in advance. In addition, the faculty member will need to secure

permission from the Unit Head to ensure the learning environment is appropriate especially in term of faculty workload, room equipment, and IT support.

Note that video courses enhance the range of topics provided but they are *not* required to deliver the program.

The following courses have generated interest in being broadcasted. This list is tentative at this point. The most likely video conference offerings are SS 95657B, one of the other 4 UWO courses, maybe one of the SFU courses, and COSC 507.

Host	Course	Title	1st Offering
UWO	SS9657B	Advanced Probability	2015w1
UWO	FM 9593B	Monte Carlo Methods and Financial Applications	2015w2
UWO	SS9846A/B	Experimental Design	2015w1/2
UWO	SS9055B	Generalized Linear Models	2015w2
UWO	SS9864A	Statistical Computing	2015w1
SFU	STAT 843	Functional Data Analysis	
SFU	STAT 852	Modern Methods in Applied Statistics	
UBCO	COSC 507	Parallel Computing	2015w2
UBCO	STAT 538	Advanced Statistical Modelling	2015w1

UWO courses are graduate courses offered by the Department of Statistical and Actuarial Sciences listed at http://www.stats.uwo.ca/modules/graduate/course_list.php. SFU course are Statistics courses listed at http://www.sfu.ca/students/calendar/2015/summer/courses/stat.html.

The video conferencing option offers an additional 2 to 3 more graduate courses to our students. It is likely to be expanded in the future to disciplines other than Statistics at UWO and SFU, and Unit 5 (COSC/STAT) at UBCO.

A student who is really pressed for time has also the option of taking 2 undergraduate courses numbered 300 and above, or to take some courses at the Vancouver campus (CPSC 300 and above).

Program Capacity: 10-15 students/year

1. The graduate program requires each faculty member involved in the program to:
   a. [All] cross-listing their upper-level courses, that will become part of the regular teaching load,
   b. [Project-based] supervise 0-1 projects each year (based on committee member industry affinity),
   c. [Thesis-based] for student for whom they are the supervisor: supervise thesis and supervise in graduate seminar (as it is currently done). Co-supervise as needed.
2. The above determines the maximum capacity of the program. Target enrolment is
   a. 5-10 in thesis (currently 5 students in MSc supervised by COSC faculties and 1 by STAT faculty who are expected to go through the MSc in Computer Science), these take 2 years to graduate;
   b. 5 in project (tentative estimate based on project-active committee members);
   Consequently, the total targeted enrolment number is 10-15 students each year, after an initial ramp up phase.
3. Having cross-listed courses means student who graduated from our BSc program will have to consider a wider selection of courses as is the case currently in the IGS program. In any case, the program committee has the authority to refuse admission to students for whom the program cannot provide a rich enough selection of courses, or a good learning environment.

Relationship with the IGS program

Students will have the choice between an MSc IGS and an MSc COSC. An MSc IGS has a significant interdisciplinary focus, e.g. the supervisory committee involves at least 2 disciplines, and only allow for a thesis option. The thesis should not be

6

strictly in a single field. By contrast, the MSc COSC focuses on computer science as the primary area of contributions. It can involve another discipline like Mathematics for Optimization or Statistics for Data Science, or other disciplines when applications are involved. The basic criterion is whether the core contribution belongs to Computer Science or a mix of disciplines.

Transfer between the 2 degrees will be possible but (1) requires justification based on the primary field of contribution, and (2) requires the student to meet all the degree requirement of the receiving program.

The availability of the MSc COSC allows the MSc IGS to refocus on its core interdisciplinary focus.

ACCELERATE OKANAGAN

July 15, 2015

Dr. John Braun, Unit 5 Head
University of British Columbia Okanagan
3333 University Way
Kelowna, BC V1V 1V7

Dr. Braun,

Accelerate Okanagan is the business accelerator for technology entrepreneurs and their companies. We provide specialized tools, disciplines and structure required for success through an innovative, not-for-profit, zero-equity-stake model.
The Okanagan is the third largest tech sector in BC, only behind Vancouver and Victoria; Accelerate Okanagan continues to position itself as a leader and key resource in the growth of this sector. With the help of UBC Okanagan we provide the educational programming, mentorship advice, and networking connections required to turn talent and spirit into success.

The partnership between Accelerate Okanagan and UBC Okanagan focuses on creating links between industry and academia. Accelerate Okanagan has helped to facilitate student projects with local technology companies; these engagements have created several part time and full time hires. Accelerate Okanagan supports hundreds of events, activities, and programs each year to help students and young professionals integrate and succeed in the Okanagan technology community. Over 30 industry academic projects, engaging with approximately 230 students, have been completed in 2014 with the technology community.

UBC Okanagan's proposal for a Master of Science in Computer Science program will be integral in the role of training students for employment in the field of software development and information technology; Accelerate Okanagan recognizes these two fields as fast-growing and competitive. Individuals who apply for jobs in these fields will require hire-quality education to give them a competitive edge.

The Master of Science in Computer Science program will further enhance UBC Okanagan's support for innovation in the Interior, which in turn, supports Accelerate Okanagan's vision to become an internationally ranked, A-list destination for technology focused businesses.

Sincerely,

Pilar Portela, CEO

BC Cancer Agency
CARE & RESEARCH
An agency of the Provincial Health Services Authority

SOUTHERN INTERIOR

27 August 2015

Yves Lucet, PhD
Professor, Computer Science
Computer Science, Mathematics, Physics and Statistics (Unit 5)
Irving K. Barber School of Arts and Sciences
University of British Columbia - Okanagan
3333 University Way
Kelowna, BC, V1V 1V7
CANADA

Dear Dr. Lucet,

I am writing this letter in support of the development of a Master's level Graduate Program in Computer Science at the University of British Columbia Okanagan (UBCO). The Clinician Scientists Group at Sindi Ahluwalia Hawkins Center for the Southern Interior (SAHCSI) consists of 10 medical physicists, 15 radiation oncologists, 14 medical oncologists and one surgical oncologist, with diverse research focuses in oncology. The oncologists and one physicist all have full clinical faculty appointments with the UBC Faculty of Medicine, while all the medical physicists have adjunct appointments with Unit 5 of the Irving K. Barber School of Arts and Science. A number of them conduct research related to health informatics and big data in oncology for which we have already employed number of Computer Science summer students in the past. Furthermore, a number of our clinician scientists currently engage in productive collaboration with faculty and students in Unit 5. While we have had success in these collaborations, I strongly believe that there is untapped potential within oncology research related to information technology. Therefore, I believe the development of a Computer Science graduate program at UBCO would be mutually beneficial for both institutions.

I recognize that being associated with any graduate program gives rise to responsibilities such as curriculum deployment and the supervision of students. Our scientists are interested in participating in the teaching delivery of the Computer Science graduate program curriculum. To this end, I myself have already delivered one graduate level course in health informatics as an IGS module. I have also had the privilege to co-supervise one Masters level graduate student in Computer Science under the IGS program. With that said, I have experienced the disappointment of another potential student leaving to pursue his graduate studies in Computer Science at another BC university due to the lack of availability of a similar graduate program at UBCO.

I also believe that we have exciting and relevant research projects to offer prospective students, both at the undergraduate and graduate level. A number of Computer Science students have conducted their honours theses and Capstone projects in partnership with the SAHCSI; some of which have led to development of intellectual properties as well as commercialization opportunities. We have a number of scientists eager to engage in the (co)-supervision of graduate students in the area of health informatics.

BC Cancer Agency
CARE & RESEARCH
An agency of the Provincial Health Services Authority

SOUTHERN INTERIOR

In summary, as the chair of the Research Committee for the SAHCSI, I am very excited by the possibility of developing a graduate program in Computer Science here at UBCO. Our clinician scientists are committed to a high level of collaboration, teaching deployment, and student supervision required to enable a successful graduate program.

Sincerely,

Rasika Rajapakshe, PhD, FCCPM, HCISPP℠
Chair, Research Committee and Senior Medical Physicist, BC Cancer Agency, Southern Interior
Physics Leader, Screening Mammography Program, BC Cancer Agency
Clinical Assistant Professor, Faculty of Medicine, UBC
Adjunct Professor, Computer Science, UBCO
(250) 712-3915
rrajapak@bccancer.bc.ca
www.earlydetection.ca

Interior Health

Mal Griffin
Chief Information Officer
Corporate Director, Service Innovation

#200 – 1835 Gordon Drive
Kelowna, B.C.
Web: interiorhealth.ca

September 22, 2015

Dr. Lucet
Associate Professor, Computer Science, Arts & Sciences
Director, Centre for Optimization Convex Analysis and Nonsmooth Analysis
The University of British Columbia, Okanagan

Dear Dr Lucet:

I am writing you in support of your proposal to initiate a graduate program in Computer Science at UBC Okanagan.

Interior Health employs more than two hundred and fifty health informatics professionals of which approximately twenty are focused on advanced analytics, data modeling and prediction. In addition, adoption of information technology solutions by health professionals is heavily reliant on human factors and advanced capabilities which could be a focus of a graduate program. Highly skilled and job ready individuals are in high demand and short supply and we have a great deal of challenge recruiting people to the Kelowna area. I am convinced a graduate program at UBC Okanagan would greatly benefit our organization in addition to other businesses in Kelowna and the south interior of BC. Interior Health would also be interested in supporting the program by engaging students in health delivery related research and operational projects.

I am excited about the potential opportunity of a computing science graduate program offered in Kelowna and wholeheartedly offer you my support.

Sincerely,

Mal Griffin, MBA
Chief Information Officer

SFU

Faculty of Science

Department of Statistics &
Actuarial Science

Thomas M. Loughin, Chair
Email: tloughin@sfu.ca
Phone: 778-782-8037
Fax: 778-782-4368

street address:
8888 University Drive,
Burnaby BC V5A 1S6
Canada

mailing address:
Room SC K10545
8888 University Drive,
Burnaby BC V5A 1S6
Canada

Yves Lucet
Computer Science Graduate Program
UBC Okanagan
Kelowna, BC V1V 1V7

Dear Professor Lucet,

I would like to offer my support for the MSC program in Computer Science.
My department has had discussions with John Braun and others about
jointly offering courses via video-conference. We have done this before
with UBC - Vancouver and may be able to do so in the future with UBC -
Okanagan as resources allow for it.

Please contact me if you wish to discuss this further.

Best regards,

Thomas M. Loughin
Chair, Department of Statistics and Actuarial Science

Western

Science

July 17 2015

Yves Lucet, Computer Science Graduate Program
UBC Okanagan
Kelowna, BC V1V 1V7

Dear Professor Lucet,

Professor John Braun has told me about the plans currently under way at UBC Okanagan to develop a M.Sc. in Computer Science, with a stream in Data Science. We would be eager to share courses, for example via video-conference, with you so that we could help one another by leveraging expertise present at each of our campuses to our mutual benefit. At Western we have, in addition to expertise in relevant areas of statistics, expertise in financial and actuarial business analytics, as well as in health care analytics. We'd be happy to make certain courses in these areas accessible to your students in exchange for courses offered by your faculty to our students.

With my best wishes,

Matt Davison
Professor and Department Chair, Department of Statistical & Actuarial Sciences
Professor and Acting Department Chair, Department of Applied Mathematics
Fields Institute Fellow
President-Elect, Canadian Applied and Industrial Math Society
Canada Research Chair in Quantitative Finance
Western University Canada
519 661 3621, mdavison@uwo.ca

UBC a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Unit **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** June 18, 2015 **Contact Person:** Dr. Yves Lucet **Phone:** 250.807.9505 **Email:** yves.lucet@ubc.ca
Type of Action: [delete other choices] New Program	
Rationale: New MSc program in Computer Science. See Executive summary and program introduction	

	Draft Academic Calendar URL: **URL** http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,0,0
Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
Contents Introduction Admission Classification of Students Academic Regulations Awards and Scholarships Interdisciplinary Graduate Studies Biochemistry and Molecular Biology Biology Chemistry **Computer Science** Education Engineering English Environmental Sciences Fine Arts Health and Exercise Sciences Mathematics Medical Physics Nursing Psychology Social Work	**Contents** Introduction → Admission → Classification of Students → Academic Regulations → Awards and Scholarships → Interdisciplinary Graduate Studies → Biochemistry and Molecular Biology → Biology → Chemistry → Education Engineering → English → Environmental Sciences → Fine Arts → Health and Exercise Sciences → Mathematics → Medical Physics → Nursing → Psychology → Social Work →

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THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS	**Date:** June 17, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action:
New Program

Rationale: New MSc program in Computer Science. See Executive summary and program introduction

Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
Homepage-Faculties, Schools, Colleges-College of Graduate Studies	(Cut and paste from the draft Academic Calendar.)
Computer Science	
Contents	N/A
Program Overview	➜
Admission Requirements	➜
Program Requirements	➜
Contact Information	➜

UBC a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
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Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action: [delete other choices]
New Program

Rationale: New MSc program in Computer Science. See Executive summary and program introduction

Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:** (Cut and paste from the draft Academic Calendar.)
Program Overview *Degrees offered: M.Sc.* **The Computer Science graduate program offers opportunities for advanced study leading to a Master of Science (M.Sc.) in Computer Science. Research interests of Computer Science (and associated) faculty members include general computer science topics (algorithms, artificial intelligence, computer science education, databases, human-computer interaction, social networks models, etc.), optimization (nonlinear programming, convex, nonconvex and variational analysis, modeling, numerical simulations), and data science (computational statistics, databases, design and analysis of experiments).**	

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THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS	**Date:** June 17, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action: [delete other choices]
New Program

Rationale: New MSc program in Computer Science. See Executive summary and program introduction.

   The minimum requirements to be considered are Honours or BSc in computer science or related field, minimum GPA for MSc in CoGS (currently B+ i.e. 76% from a Canadian/American institution or international equivalent). Exact rules are detailed in the link provided.

   The program admission committee will apply the same process as the one currently used in Unit 5 for IGS students i.e. meeting the minimum requirement does not guarantee admission. The rationale is to estimate the quantity and quality of applications manually in the first years instead of imposing a bar without knowing the consequences on the admission pool.

Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
	(Cut and paste from the draft Academic Calendar.)
Admission Requirements	
Master of Science (M.Sc.)	
The M.Sc. program is governed by the regulations of the College of Graduate Studies, including its standards for admission of students.	
Applicants to the M.Sc. program will normally have an honours or a bachelor's degree in Computer Science. Applicants in a related field that fits within the program are also welcome to apply. For example, applicants with interest in Optimization may have a degree in Mathematics and interest in scientific computing while applicants interested in data science may have a degree in Statistics and computational skills.	

Commented [UO1]: http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,285,998,1197

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Applicants from a university outside Canada at which English is not the primary language of instruction, please see the English Language Proficiency Requirement for the minimum English language proficiency test scores required. **While applications to the thesis- and project-based option with no identified supervisor will be accepted, no applicant will be admitted to the thesis- or project-based options until a supervisor has agreed to supervise the student's thesis or project; thus, applicants who wish to pursue a thesis or project option are strongly urged to identify and contact a potential supervisor prior to applying.**	

Commented [UO2]: http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,285,998,1196#13868

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: IKBSAS	**Date:** June 17, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action: [delete other choices]
New Program

Rationale: New MSc program in Computer Science. See Executive summary and program introduction

Proposed Academic Calendar Entry:	Present Academic Calendar Entry: (Cut and paste from the draft Academic Calendar.)

Proposed Academic Calendar Entry:

Program Requirements

Master of Science (M.Sc.)

In addition to the general academic regulations for graduate students set out by the College of Graduate Studies, students in the M.Sc. in Computer Science select one of the following two options when they apply to the program:

1. thesis option: 18 credits of coursework, plus a 12-credit M.Sc. thesis (COSC 549)

2. project option: 24 credits of coursework, plus a 6-credit M.Sc. project (COSC 550)

All coursework credit must be selected by the student in consultation and with the approval of the supervisor(s) from a list of core courses in Computer Science (COSC), Optimization (COSC or MATH), and Data Science (DATA or STAT) before being submitted to the program coordinator for approval. Other courses in similar disciplines like Computer Science courses offered by UBC Vancouver (CPSC) and courses available through the Western Dean's or similar agreements are eligible subject to approval of the supervisor and program coordinator. The supervisory committee may require additional course work, if deemed necessary for successful completion of the program.

Commented [UO3]: http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,984,1167

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS	**Date:** June 17, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action: [delete other choices]
New Program

Rationale: New MSc program in Computer Science. See Executive summary and program introduction

Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
Contact Information **For complete details regarding the Computer Science graduate program, please visit Computer Science or contact the Graduate Program Coordinator.**	(Cut and paste from the draft Academic Calendar.)

Commented [UO4]: http://cosc.ok.ubc.ca/graduate.html

Commented [UO5]: mailto:yves.lucet@ubc.ca

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS	**Date:** May 29, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Bowen Hui
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9353
Effective Session: 2016W	**Email:** bowen.hui@ubc.ca
Type of Action: New Course	

Rationale:

New courses to support the proposed new MSc in Computer Science program.

Mobile educational game development is a special area of mobile computing and human computer interaction – both of which are core areas of computer science. Knowledge and practical experience in both of these areas are crucial for students wanting to pursue jobs in the computing industry. Since mobile devices are relatively new and the technology is still changing rapidly, there are still many research issues relevant to interaction and usability that needs to be tackled. One of the topics of this course focuses on learning analytics, which will also foster interest to those pursuing the Data Science cluster in the MSc COSC program.

Proposed Academic Calendar Entry:	Draft Academic Calendar URL: N/A
COSC 442 (3) Mobile Educational Game Development **Game design and development on a mobile platform with special attention to educational games. Topics may include: educational frameworks, storytelling techniques, game design, iterative prototyping, evaluation methodology, learner modeling, and learning analytics. Credit will not be granted for both COSC 442 and COSC 542. [3-0-0] Prerequisites: COSC 341 and COSC 310.** **COSC 542 (3) Mobile Educational Game Development** **Game design and development on a mobile platform with special attention to educational games. Topics may include: educational frameworks, storytelling techniques, game design, iterative prototyping, evaluation methodology, learner modeling, and learning analytics. Credit will not be granted for both COSC 442 and COSC 542.**	**Present Academic Calendar Entry:** N/A

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: IKBSAS	**Date:** June 10, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Ramon Lawrence
Faculty/School Approval Date: June 15, 2015	**Phone:** 250.807.9390
Effective Session: 2016W	**Email:** ramon.lawrence@ubc.ca

Type of Action: New Course

Rationale:
COSC 504 is a graduate course for the new M.Sc. in Computer Science. The content of COSC 504 is taught in graduate courses across North America including Stanford, MIT, and Toronto. This course will be one of the core courses in the M.Sc. program. It has been offered as COSC 404 at UBC Okanagan, although at other institutions it is a cross-listed course open to both undergraduate and graduate students.

Proposed Academic Calendar Entry:	Draft Academic Calendar URL:
COSC 504 (3) Database System Implementation **Fundamental concepts in constructing database systems including file organizations, storage management, system architectures, query processing/optimization, transaction management, recovery, and concurrency control. Additional topics may include distributed databases, mobile databases, and integration. Credit will not be granted for both COSC 404 and COSC 504.** **COSC 404 (3) Database System Implementation** Fundamental concepts in constructing database systems including file organizations, storage management, system architectures, query processing/optimization, transaction management, recovery, and concurrency control. Additional topics may include distributed databases, mobile databases, and integration. **Credit will not be granted for both COSC 404 and COSC 504.** [3-2-0] Prerequisite: A score of 60% or higher in COSC 304 and third-year standing.	N/A **Present Academic Calendar Entry:** N/A **Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC **Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 404 (3) Database System Implementation** Fundamental concepts in constructing database systems including file organizations, storage management, system architectures, query processing/optimization, transaction management, recovery, and concurrency control. Additional topics may include distributed databases, mobile databases, and integration. [3-2-0] Prerequisite: A score of 60% or higher in COSC 304 and third-year standing.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** April 2, 2015 **Contact Person:** Dr. Yves Lucet **Phone:** 250.807.9505 **Email:** yves.lucet@ubc.ca

Type of Action: New Course

Rationale:

New courses to support the proposed new MSc in Computer Science program.

The content of COSC 505 has been taught as IGS 501. It covers important content for computer science students in general but especially for students interested in Data Science, Optimization or more generally in scientific computing.

Proposed Academic Calendar Entry:	Draft Academic Calendar URL: N/A
	Present Academic Calendar Entry: N/A
COSC 505 (3) Modeling and Simulation Simulation methodology: data collection, model design, output analysis, optimization, validation. Credit will not be granted for both COSC 405 and COSC 505.	
	Draft Academic Calendar URL: http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC
	Present Academic Calendar Entry: http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC
COSC 405 (3) Modelling and Simulation Numeric dynamic systems models and emphasis on discrete stochastic systems. State description of models, common model components, entities. Common simulation language. Simulation using algebraic languages. Simulation methodology: data collection, model design, output analysis, optimization, validation. Elements of queuing theory, relationship to simulation. Applications to computer systems models. **Credit will not be granted for both COSC 405 and COSC 505.** [3-2-0] Prerequisite: A score of 60% or higher in COSC 221 and a score of 60% or higher in COSC 222.	**COSC 405 (3) Modelling and Simulation** Numeric dynamic systems models and emphasis on discrete stochastic systems. State description of models, common model components, entities. Common simulation language. Simulation using algebraic languages. Simulation methodology: data collection, model design, output analysis, optimization, validation. Elements of queuing theory, relationship to simulation. Applications to computer systems models. [3-2-0] Prerequisite: A score of 60% or higher in COSC 221 and a score of 60% or higher in COSC 222.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** April 2, 2015 **Contact Person:** Dr. Yves Lucet **Phone:** 250.807.9505 **Email:** yves.lucet@ubc.ca

Type of Action: **New Course**

Rationale:
New courses to support the proposed new MSc in Computer Science program.

The content of COSC 506 has been taught several times as IGS 540. It forms the core of smooth nonlinear optimization with an algorithmic viewpoint that is of interest for students in computer science in general but especially for students interested in scientific computing, optimization, operations research, and modeling.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A
	Present Academic Calendar Entry: N/A
COSC 506 (3) Numerical Optimization Formulation and analysis of algorithms for continuous optimization problems; linear, quadratic, semi-definite, nonlinear (constrained and unconstrained); large-scale problems. Credit will not be granted for both COSC 406 and COSC 506.	
	Draft Academic Calendar URL: http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC
COSC 406 (3) Numerical Optimization Formulation and analysis of algorithms for continuous optimization problems; linear, quadratic, semi-definite, nonlinear (constrained and unconstrained), convex (smooth and non-smooth) optimization; large-scale problems; software packages and their implementation; elements of duality theory. **Credit will not be granted for both COSC 406 and COSC 506.** [3-2-0] Prerequisite: All of MATH 200, MATH 221.	**Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 406 (3) Numerical Optimization** Formulation and analysis of algorithms for continuous optimization problems; linear, quadratic, semi-definite, nonlinear (constrained and unconstrained), convex (smooth and non-smooth) optimization; large-scale problems; software packages and their implementation; elements of duality theory. [3-2-0] Prerequisite: All of MATH 200, MATH 221.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** April 2, 2015 **Contact Person:** Dr. Yves Lucet **Phone:** 250.807.9505 **Email:** yves.lucet@ubc.ca
Type of Action: New Course	
Rationale: New courses to support the proposed new MSc in Computer Science program. The content of COSC 507 has been taught several times as IGS 540. In our age of multicore computers, easy access to distributed computing, and inclusion of GPU in almost every computer, it has become critical for computer science students to be able to understand the challenges of parallel computing, and to be able to quickly parallelize the embarrassingly parallel part of their codes. Students should also realize the limitation of each parallel architecture in order to recommend the most efficient one.	

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A
COSC 507 (3) Parallel Computing **Design and implementation of parallel programs including theoretical computer models, parallel architectures, and standard parallel libraries. Performance analysis of parallel programs. Credit will not be granted for both COSC 407 and COSC 507.** **COSC 407 (3) Introduction to Parallel Computing** Design and implementation of parallel programs including theoretical computer models, parallel architectures (distributed, multicore, GPU), and standard parallel libraries. **Credit will not be granted for both COSC 407 and COSC 507.** [3-2-0] Prerequisite: Either (a) COSC 111 or (b) APSC 177. Third-year standing is required.	**Present Academic Calendar Entry:** N/A **Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC **Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 407 (3) Introduction to Parallel Computing** Design and implementation of parallel programs including theoretical computer models, parallel architectures (distributed, multicore, GPU), and standard parallel libraries. [3-2-0] Prerequisite: Either (a) COSC 111 or (b) APSC 177. Third-year standing is required.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** June 10, 2015 **Contact Person:** Ramon Lawrence **Phone:** 250.807.9390 **Email:** yves.lucet@ubc.ca
Type of Action: New Course	
Rationale: COSC 516 is a topics course for topics related to databases. As the topic may change in various offerings, there is no syllabus for this course. A topics course is offered on an as needed basis to address new developments in the field, specific expertise of various instructors, and to test out data-related courses before creating permanent course entries in the calendar.	

| **Proposed Academic Calendar Entry:**

COSC 516 (3/6)d Special Topics in Databases Advanced or specialized topics in database design, modeling, and implementation. Credit will not be granted for both COSC 416 and COSC 516 when the subject matter is of the same nature.

COSC 416 (3-9) d Special Topics in Databases
Advanced or specialized topics in database design, modelling, and implementation. **Credit will not be granted for both COSC 416 and COSC 516 when the subject matter is of the same nature.**
Prerequisite: A score of 60% or higher in COSC 304 and third-year standing. | **Draft Academic Calendar URL:**
N/A
Present Academic Calendar Entry: N/A

Draft Academic Calendar URL:
http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC
Present Academic Calendar Entry:
http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC

COSC 416 (3-9) d Special Topics in Databases
Advanced or specialized topics in database design, modelling, and implementation. ~~This course may be taken more than once for credit.~~
Prerequisite: A score of 60% or higher in COSC 304 and third-year standing. |

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** April 2, 2015 **Contact Person:** Dr. Yves Lucet **Phone:** 250.807.9505 **Email:** yves.lucet@ubc.ca

Type of Action: **New Course**

Rationale:
New courses to support the proposed new MSc in Computer Science program.

A topics course is offered on an as needed basis to address new developments in the field, specific expertise of various instructors, and to test out data-related courses before creating permanent course entries in the calendar.

Proposed Academic Calendar Entry:	Draft Academic Calendar URL:
COSC 519 (3/6)d Topics in Computer Science Advanced or specialized topics in computer science. Credit will not be granted for both COSC 419 and COSC 519 when the subject matter is of the same nature.	N/A **Present Academic Calendar Entry:** N/A
COSC 419 (3-9)d Topics in Computer Science Advanced or specialized topics in computer science. Consult the unit for the specific topic to be offered in any given year. **Credit will not be granted for both COSC 419 and COSC 519 when the subject matter is of the same nature.** *Prerequisite:* Fourth-year standing.	**Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC **Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 419 (3-9)d Topics in Computer Science** Advanced or specialized topics in computer science. Consult the unit for the specific topic to be offered in any given year. ~~This course may be taken more than once for credit with different topics.~~ *Prerequisite:* Fourth-year standing.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** April 2, 2015 **Contact Person:** Dr. Yong Gao **Phone:** 250.807.9503 **Email:** yong.gao@ubc.ca

Type of Action: New Course

Rationale:
New courses to support the proposed new MSc in Computer Science program.
The advanced algorithms course is fundamental to computer science programs. It expands from the undergraduate algorithm course COSC 320 and provides a critical insight into advanced tools required of any graduate student in computer science.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A
COSC 520 (3) Advanced Algorithms **Algorithm design and analysis with applications in scientific research. Fundamental design and analysis techniques. Basics of algorithmic graph theory. Parameterization, approximation, and randomization techniques. Algorithms for computational-hard problems and problems involving large-scale networks and/or massive datasets. Credit will not be granted for both COSC 320 and COSC 520.**	**Present Academic Calendar Entry:** N/A **Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC
COSC 320 (3) Analysis of Algorithms Design and analysis of algorithms, illustrated from various problem areas. Models of computation, choice of data structures, space and time efficiency, computation complexity, algorithms for searching, sorting and graph-theoretic problems, NP-complete problems. **Credit will not be granted for both COSC 320 and COSC 520.** [3-0-0] Prerequisite: All of COSC 221, COSC 222, MATH 221.	**Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 320 (3) Analysis of Algorithms** Design and analysis of algorithms, illustrated from various problem areas. Models of computation, choice of data structures, space and time efficiency, computation complexity, algorithms for searching, sorting and graph-theoretic problems, NP-complete problems. [3-0-0] Prerequisite: All of COSC 221, COSC 222, MATH 221.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS	**Date:** June 17, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yong Gao
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9503
Effective Session: 2016W	**Email:** yong.gao@ubc.ca

Type of Action: New Course

Rationale:
New courses to support the proposed new MSc in Computer Science program. Artificial intelligence has become a very important technique to attack a number of hard problems. It forms part of the toolbox for graduate students in computer science.

Proposed Academic Calendar Entry:	Draft Academic Calendar URL:
COSC 522 (3) Advanced Topics in Artificial Intelligence **Artificial intelligence and intelligent systems. Problem solving techniques, state-space search, game-tree search, and constraint programming. Topics in logic reasoning, multiagent systems, and game theory. Probabilistic reasoning, machine learning, and applications in digital games/arts, data mining, and natural language processing. Credit will not be granted for both COSC 322 and COSC 522.** **COSC 322 (3) Introduction to Artificial Intelligence** AI and intelligent agents; state space search; game playing agents; logic and knowledge-based agents; constraint programming; planning; reasoning and decision making under uncertainty; machine learning; natural language understanding. **Credit will not be granted for both COSC 322 and COSC 522.** [3-2-0] Prerequisite: All of COSC 221, COSC 222.	N/A **Present Academic Calendar Entry:** N/A **Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC **Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 322 (3) Introduction to Artificial Intelligence** AI and intelligent agents; state space search; game playing agents; logic and knowledge-based agents; constraint programming; planning; reasoning and decision making under uncertainty; machine learning; natural language understanding. [3-2-0] Prerequisite: All of COSC 221, COSC 222.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** May 29, 2015 **Contact Person:** Dr. Bowen Hui **Phone:** 250.807.9353 **Email:** bowen.hui@ubc.ca
Type of Action: New Course	
Rationale: New courses to support the proposed new MSc in Computer Science program. Human-computer interaction (HCI) is a standard course in most graduate computer science programs. HCI topics are particularly important to the development of many pervasive technologies today, such as mobile devices, web applications, and online learning platforms. Various topics in this course, such as data visualization, evaluation methodology, and quantitative analysis, are particularly relevant for students interested in the Data Science program.	
Proposed Academic Calendar Entry: **COSC 541 (3) Advanced Human Computer Interaction: Principles of design and interaction, novel interfaces and platforms, prototyping, evaluation methodology, quantitative analysis. Credit will not be granted for both COSC 341 and COSC 541.** **COSC 341 (3) Human Computer Interaction** Examines the basic principles behind interaction design; how humans interact with computers, as well as the user-centered design cycle; user task analysis, task models, graphical interface design, prototyping, and evaluation. **Credit will not be granted for both COSC 341 and COSC 541.** [3-2-0] Prerequisite: Third-year standing.	**Draft Academic Calendar URL:** N/A **Present Academic Calendar Entry:** N/A **Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC **Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **COSC 341 (3) Human Computer Interaction** Examines the basic principles behind interaction design; how humans interact with computers, as well as the user-centered design cycle; user task analysis, task models, graphical interface design, prototyping, and evaluation. [3-2-0] Prerequisite: Third-year standing.

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS	**Date:** April 2, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action: New Course

Rationale:
New courses to support the proposed new MSc in Computer Science program.

A directed study course is required to address a very specialized topic for a handful of students, typically 1 to 3, when the topic is not expected to be taught again. The instructor schedules weekly meetings usually in his/her office to meet these students. Instruction is very individualized and reserved to the most independent students, typically involving reading assignments, discussions, and individual projects.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A
COSC 548 (3) Directed Studies	**Present Academic Calendar Entry:** N/A

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Category: 1	
Faculty/School: IKBSAS	**Date:** April 2, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca
Type of Action: New Course	
Rationale: New courses to support the proposed new MSc in Computer Science program.	

Proposed Academic Calendar Entry:	Draft Academic Calendar URL:
COSC 549 (12) Master's Thesis. Pass/Fail	**URL** N/A
	Present Academic Calendar Entry: N/A

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New/Change to Course/Program – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** April 2, 2015 **Contact Person:** Dr. Yves Lucet **Phone:** 250.807.9505 **Email:** yves.lucet@ubc.ca

Type of Action: New Course

Rationale:

New courses to support the proposed new MSc in Computer Science program.

This course is mandatory for students in the project-based option.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A
COSC 550 (6) Master's Project. Pass/Fail	**Present Academic Calendar Entry:** N/A

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Faculty/School: IKBSAS	**Date:** April 2, 2015
Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca
Type of Action: New Course	
Rationale: New courses to support the proposed new MSc in Computer Science program. This course consists of a survey of the literature in a specific subfield of computer science. It mirrors UBC V CPSC 589 and is better created as an explicit course than run as a directed study course.	
Proposed Academic Calendar Entry: **COSC 589 (3) Master's Essay. Pass/Fail**	**Draft Academic Calendar URL:** N/A **Present Academic Calendar Entry:** N/A

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Category: **1**	
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Dept./Unit: Computer Science/Unit 5	**Contact Person:** Dr. Yves Lucet
Faculty/School Approval Date: August 19, 2015	**Phone:** 250.807.9505
Effective Session: 2016W	**Email:** yves.lucet@ubc.ca

Type of Action: New Course

Rationale:
New courses to support the proposed new MSc in Computer Science program.

A Graduate Seminar course is used to explore a specific research article. Students learn to read research articles, do a literature search for cited results, write a report, learn the LaTeX formatting language, and present technical results. All these skills are part of the learning outcome of the program and are formally assessed in the thesis and its defense.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A
COSC 590 (1-3) d Graduate Seminar Presentation and discussion of recent results in the Computer Science literature. Pass/Fail.	**Present Academic Calendar Entry:** N/A

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Category: 1	
Faculty/School: IKBSAS **Dept./Unit:** Computer Science/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** June 17, 2015 **Contact Person:** Dr. Yong Gao **Phone:** 250.807.9503 **Email:** yong.gao@ubc.ca
Type of Action: New Course	
Rationale: New courses to provide an option to computer science students and students in the Data Science minor program. A new course that covers computing techniques and statistical methods in the emerging interdisciplinary research field of network science. It provides an important option for computer science students and students interested in completing a Data Science minor.	
Proposed Academic Calendar Entry: **DATA 421 (3) Network Science** **Graphs and complex networks in scientific research. Probabilistic and statistical models. Structures, patterns, and behaviors in networks. Algorithmic and statistical methods. (online/mobile) social networks and social media platforms. Social influence, information diffusion, and viral marketing. Sentiment analysis and opinion mining. Data privacy. Search engines and recommendation systems. Credit will not be granted for both DATA 421 and DATA 521.** **Prerequisite: Third-year standing.** **DATA 521 (3) Network Science** **Graphs and complex networks in scientific research. Probabilistic and statistical models. Structures, patterns, and behaviors in networks. Algorithmic and statistical methods. (online/mobile) social networks and social media platforms. Social influence, information diffusion, and viral marketing. Sentiment analysis and opinion mining. Data privacy. Search engines and recommendation systems. Credit will not be granted for both DATA 421 and DATA 521.**	**Draft Academic Calendar URL:** N/A **Present Academic Calendar Entry:** N/A

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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

<table>
<tr><td colspan="2">Category: 1</td></tr>
<tr>
<td>Faculty/School: IKBSAS
Dept./Unit: Unit 5
Faculty/School Approval Date: August 19, 2015
Effective Session: 2016W</td>
<td>Date: June 13, 2015
Contact Person: Dr. Jason Loeppky
Phone: 250.807.8795
Email:jason.loeppky@ubc.ca</td>
</tr>
<tr><td colspan="2">Type of Action: New Course</td></tr>
<tr><td colspan="2">Rationale:
New courses to support the proposed new MSc in Computer Science program.

Students will gain exposure to consulting from the perspective of statistics and computer science. The course supports the entire program. It provides students with the tools to practice consulting and effectively communicate data science results.</td></tr>
<tr>
<td>Proposed Academic Calendar Entry:
DATA 500 (3) Communication and Consulting in Data Science
Effective consulting practices, ethical considerations, methodology selection, data preparation, effective software development. Credit will not be granted for both DATA 500 and STAT 400 when the subject matter is of the same nature.

STAT 400 (3) Statistical Communication and Consulting
Development of broad guidelines for a comprehensive approach to data analysis with a focus on communicating statistical ideas from planning experiments to the presentation of results. Topics include criteria for selection of suitable methodologies, data preparation, outlier detection, and exploratory data analysis. Credit will not be granted for both DATA 500 and STAT 400 when the subject matter is of the same nature. [3-0-0] Prerequisite: STAT 310, and fourth-year standing in the Statistics major or honours program.</td>
<td>Draft Academic Calendar URL:
N/A
Present Academic Calendar Entry:
N/A

Draft Academic Calendar URL:
http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=STAT
Present Academic Calendar Entry: http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=STAT

STAT 400 (3) Statistical Communication and Consulting
Development of broad guidelines for a comprehensive approach to data analysis with a focus on communicating statistical ideas from planning experiments to the presentation of results. Topics include criteria for selection of suitable methodologies, data preparation, outlier detection, and exploratory data analysis. [3-0-0] Prerequisite: STAT 310, and fourth-year standing in the Statistics major or honours program.</td>
</tr>
</table>

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Unit 5 – Computer Science **Faculty/School Approval Date:** June 15, 2015 **Effective Session:** 2016W	**Date:** June 10, 2015 **Contact Person:** Dr. Ramon Lawrence **Phone:** 250.807.9390 **Email:** ramon.lawrence@ubc.ca

Type of Action: New Course

Rationale: This course will be a foundational course in the new M.Sc. in Computer Science with a data science/analytics focus. The course uses the subject code DATA to represent its focus on interdisciplinary data analytics that is present in many applications and research areas.

The lecture component of the course will be the same as DATA 301. Graduate students will be responsible for an industrial or community-based project in addition to more specialized and demanding assignments.

Proposed Academic Calendar Entry:

DATA 501 (3) Data Analytics

Techniques for computation, analysis, and visualization of data using software. Manipulation of small and large data sets. Automation using scripting. Real-world applications from life sciences, physical sciences, engineering, or psychology. Credit will not be granted for both DATA 301 and DATA 501.

DATA 301 (3) Introduction to Data Analytics
Techniques for computation, analysis, and visualization of data using software. Manipulation of small and large data sets. Automation using scripting. Real-world applications from life sciences, physical sciences, economics, engineering, or psychology. No prior computing background is required. **Credit will not be granted for both DATA 301 and DATA 501.** [3-2-0]
Prerequisite: Third-year standing.

Draft Academic Calendar URL: N/A

Present Academic Calendar Entry: None

Draft Academic Calendar URL: http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=DATA
Present Academic Calendar Entry: http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=DATA

DATA 301 (3) Introduction to Data Analytics
Techniques for computation, analysis, and visualization of data using software. Manipulation of small and large data sets. Automation using scripting. Real-world applications from life sciences, physical sciences, economics, engineering, or psychology. No prior computing background is required. [3-2-0]
Prerequisite: Third-year standing.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: **1**	
Faculty/School: IKBSAS **Dept./Unit:** Statistics/Unit 5 **Faculty/School Approval Date:** August 19, 2015 **Effective Session:** 2016W	**Date:** June 10, 2015 **Contact Person:** Jason Loeppky **Phone:** 250.807.8795 **Email:** Jason.loeppky@ubc.ca
Type of Action: New Course	
Rationale: STAT 507 is a graduate course for the new M.Sc. in Computer Science. The content is critical for data science programs as it covers fundamental methods in data collection.	

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** N/A **Present Academic Calendar Entry:** N/A
STAT 507 (3) Sampling and Design **Collection of data using either designed experiments or survey samples. Planning and practice of data collection. Observational and experimental data pros and cons. Standard methods in survey samples. Experimental design review. Credit will not be granted for both STAT 407 and STAT 507.** **STAT 407 (3) Sample Surveys** Planning and practice of sample surveys. Random sampling; bias and variance; unequal probability sampling; systematic, multistage, and stratified sampling; ratio and regression estimators; post-stratification; establishing a frame; pretesting; pilot studies; nonresponse; and additional topics. **Credit will not be granted for both STAT 407 and STAT 507.** [3-0-0] Prerequisite: All of STAT 230, STAT 303.	**Draft Academic Calendar URL:** http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=COSC **Present Academic Calendar Entry:** http://www.calendar.ubc.ca/okanagan/courses.cfm?go=name&code=COSC **STAT 407 (3) Sample Surveys** Planning and practice of sample surveys. Random sampling; bias and variance; unequal probability sampling; systematic, multistage, and stratified sampling; ratio and regression estimators; post-stratification; establishing a frame; pretesting; pilot studies; nonresponse; and additional topics. [3-0-0] Prerequisite: All of STAT 230, STAT 303.

Executive Summary

**Master of Engineering Leadership Resource Engineering Management
Faculty of Applied Science**

**The University of British Columbia
November 3, 2015**

Institutional Overview

The University of British Columbia is a global center for research and teaching and is consistently ranked among the 40 best universities in the world. Since its inception in Vancouver in 1915, UBC has embraced innovation and created an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada and the world. In 2013-14, UBC welcomed over 58,000 undergraduate and graduate students, including 10,000 international students from 149 countries. The university granted over 12,000 degrees in 2013.

UBC's highest-level strategic priorities and institutional commitments are outlined in our Strategic Plan, *Place and Promise* (www.strategicplan.ubc.ca), focusing on nine key values: student learning; research excellence; community engagement; Aboriginal engagement; alumni engagement; intercultural understanding; international engagement; an outstanding work environment for our 15,000 faculty and staff members; and sustainability.

Credential:	Master of Engineering Leadership in Resource Engineering Management (Abbreviation: MEL REM)
Location:	The University of British Columbia (UBC), Okanagan campus
Faculty:	Faculty of Applied Science
Anticipated Start Date:	January 2017
Anticipated Completion Time:	The MEL REM will be delivered as an intensive one-year program (two four-month terms and two two-month terms).

Program Goal

The goal of the MEL REM program is to provide students with a comprehensive and innovative graduate-level education that enables them to lead and manage complex, inter-disciplinary projects in any one of a number of resource industries. This is accomplished with a curriculum that emphasizes business, leadership and project management skills on the one hand, and technical knowledge on the other.

Program Objectives

- Equip resource engineering professionals with the critical thinking and practical skills necessary to make important contributions to their industry and to make Canada a leader in the global market.

- Link the concerns of extra-university partners by offering students a project-based curriculum that explores cutting edge concepts in collaboration with industry professionals in BC.
- Emerge as the leading institution for the continuing education of current leaders in resource industries and for the training of tomorrow's leaders.
- Graduate highly skilled resource engineering professionals who can meet the demands of resource industries in Canada both now and in the future.
- Continue to develop a high profile faculty with international expertise in the theory and practice of resource engineering management.

Contribution to UBC Mandate and Strategic Plan

The UBC Plan promises to "create an exceptional learning environment" and work "towards global citizenship." With the involvement of local industry and faculty from various disciplines, the MEL REM program will offer an exceptional learning environment for students and faculty undertaking research in resource engineering management. In addition, the MEL REM program will attract students from around the world to the Okanagan region of Canada. These international students will enrich the diversity the UBC Okanagan student body in general and will bring a global perspective to the MEL REM program in particular. As a result, all students in the MEL REM program will gain a greater appreciation of the need to incorporate sustainable practices in the resource industries and how such practices can impact the physical and social environments both locally and globally. Consequently, the MEL REM program shares many of UBC's strategic goals.

Program Learning Outcomes

After completing the MEL REM program, students will be able to:
- Apply advanced project management and leadership concepts and skills to complex, multidisciplinary projects.
- Understand and apply provincial and federal laws governing resource management.
- Understand and apply technical and practical aspects of infrastructure performance.
- Understand and apply practices, techniques and methods of sustainable resource management.
- Use leadership skills, including communication, collaboration, mediation and consensus building strategies, to advocate for positive changes and sustainable development of resources.
- Use knowledge of models for individual and group behaviour to design efficient organizational practices and structures.
- Apply core business skills to the analysis of business issues and thereby make critical business decisions.
- Demonstrate a mastery of basic and advanced statistical methods in the context of reliability engineering and system safety.
- Identify the issues pertaining to the legal and ethical aspects of federal, provincial and territorial regulations related to resource extraction, transport and processing.
- Apply advanced life cycle assessment methods to projects, products and services in the resource industries.
- Perform risk analysis and uncertainty analysis for complex environmental systems and apply multi-criteria decision-making frameworks for risk management.
- Effectively communicate in a professional environment through a number of different mediums including written, verbal, and presentations.

2

Program Content
The MEL REM program requires students to complete 30 credits of coursework. Twelve of the 30 credits consist of professional platform courses in which students learn business, leadership and project management skills. The remaining 18 credits are made up of technical courses including a 3-credit project course in which students will complete an engineering project of interest to an industry sponsor. Of the 18 technical credits, 12 credits consist of compulsory courses (including the 3-credit project course) and the remaining 6 credits consist of technical electives.

Linkages between Learning Outcomes and Curriculum Design
The number and variety of courses available to students is purposely limited to ensure a robust and streamlined learning experience that is centered on the MEL REM program objectives. Many of the program's learning outcomes are achieved in the compulsory professional platform courses. The compulsory technical courses are designed such that students will acquire the technical skills and knowledge that are necessary in any resource industry. Students will choose 2 technical electives from an approved list of courses in order to strengthen their technical expertise in a particular resource area. Finally, the project course is designed to enable students to apply many of their newly acquired skills and knowledge to a practical real-life project of interest to an industry sponsor.

Potential Sectors of Employment for Graduates
Graduates of the program can expect to find careers locally, nationally, and internationally, in a number of resource industries including: oil & gas, forestry, mining, power, and water as well as the government and academia. Given the continued importance of resource-based industries to both Canada's economy and the global economy, graduates of this program are expected to be in high demand within Canada.

Opportunities for Further Study
The MEL REM program is designed primarily for students who are taking a leave from their current employment in order to pursue this degree, or students who wish to enter the workforce after graduation. Therefore it is anticipated that most or all of the graduating students will go on to work in one of many resource industries.

Delivery Methods
The MEL REM courses will involve a combination of classroom learning and project learning. In the first four-month term (Jan. – Apr.), students will take 12 credits of coursework including both professional platform courses and technical courses. In the subsequent two-month term (May – Jun.), students will take 4.5 credits of professional platform coursework. In the next two-month term (Jul. – Aug.) students will complete a resource engineering focused project (3 credits) in collaboration with an industry sponsor. Depending on the project and industry sponsor, the student may work on the project on the UBC Okanagan campus or on the premises of the industry sponsor. Finally, during the second four-month term (Sep. – Dec.), the student will complete 10.5 credits of coursework.

Program Strengths
Consultation with representatives from the resource industries highlighted the need for professionals with the ability to make sound business decisions that are informed by technical knowledge and data, such that they are able to effectively lead complex projects.

The MEL REM program offers a unique curriculum that combines both business and technical knowledge in order to equip and train such professionals.

Level of Support and Recognition from other Post-Secondary Institutions
The MEL REM program will be offered, in collaboration with other UBC faculties, by the UBC School of Engineering (which is part of the UBC Faculty of Applied Science). Faculty members in the UBC School of Engineering who have expertise related to the resource industries have hosted visiting PhD students from other universities. Although the emphasis of such visits have been research collaboration (as opposed to taking courses), they serve as an example of the reputation enjoyed by School of Engineering faculty members amongst non-UBC academics who also conduct research in resource related fields.

Related Programs at UBC or other BC Post-Secondary Institutions
The University of British Columbia: Some of the technical topics that will be covered under the MEL REM program are already presented in graduate level courses offered by the UBC School of Engineering in its Master of Engineering, Master of Applied Science, and Doctorate programs. However, these courses will be integrated and packaged with newly developed technical courses and professional platform courses in a manner that makes the program unique.
Other British Columbia universities: No other universities in British Columbia offer accredited graduate level programs in Resource Engineering Management.

Contact Person(s)
School of Engineering, Faculty of Applied Science
Richard Klukas (Associate Professor)
Tel: 250-807-8718 / Email: richard.klukas@ubc.ca

4

The University of British Columbia

Faculty of Applied Science

New Program Proposal
APSC Professional Master's Program

Master of Engineering Leadership
Resource Engineering Management

October 15, 2015

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apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Table of Contents

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Proposal: Applied Science Professional Master's Program Resource Engineering Management

1. Degree to be offered

This proposal represents one of a suite of new professional programs to be offered at the Master's level in the Faculty of Applied Science. The programs are being developed in parallel and are also intended to be delivered in parallel. That is, there will be a common start date and timeline for cohorts in all of the programs. A key feature of this suite of programs is that they are structured in two distinct parts, which will be referred to as the 'platform' and the 'pillars'. The platform is a largely common element accessible to all programs. The 'pillars' contain technical material specific to a particular industry. The choice of credential for each combination of the platform and one pillar will dictate both the base degree and the specific name (based on the pillar). Successful completion of the platform and a pillar will result in the granting of one degree. Details of the contents of both the platform and the Resource Engineering Management MEL pillar are documented in this proposal.

1. Credential(s): Master of Engineering Leadership in Resource Engineering Management (Abbreviation: M.E. L. in R.E.M.);
2. Location: University of British Columbia (UBC), Okanagan campus
3. Faculty: Faculty of Applied Science (APSC)
4. Start Date: January 2017
5. Completion Time: The programs will be delivered as an intensive one-year program (three 4-month terms)

2. Program Rationale

2.1. Defining the Need for the Program

Over the past year, members of the University's Flexible Learning Initiative and the Applied Science Dean's office has formed and worked closely with a Program Advisory Committee consisting of faculty from all areas of Applied Science. The following program proposal is the result of collaborative planning on the part of this committee.

2.1.1. Professional Program Mission Statement and Context

*The University of British Columbia, Faculty of Applied Science, wishes to attract students into a **high quality**, **industry-focused, distinctive & integrated** Applied Science Professional Program that has resources to be delivered sustainably and fiscally meets the University's goals.*

1. **Reducing levels of funding** to UBC requires innovative revenue generation approaches.

2. **The Flexible Learning Strategy** introduced in 2014 lists the development of new Professional Programs as a priority.

UBC has the opportunity to deliver a distinctive APSC Program in line with the University's Professional Program objectives.

2.1.3. Guiding Principles of the Program Advisory Committee

1. There will be meaningful engagement with industry in market research, development, delivery and career opportunities.
2. Our target market will be candidates who might consider an MBA or MEng Management, but would prefer to develop industry-relevant technical skills in addition to management and leadership skills – our program will be distinctive in the market.
3. We will take advantage of a standardization of core courses to improve quality of offering and reduce costs & complexity.
4. The program will be positioned as a premium alternative to a conventional MEng by offering distinctive, high quality, cross-disciplinary technical and non-technical skills to the experienced engineer who wants to become an Industry Specialist.

2.1.4. Extensive Market Research was used to develop the Value Propositions

In order to establish the viability of offering new programs, the following activities were undertaken to validate the structure and proposed technical pillars:

1. Survey of Cooperative Education Program partners (340 responses)
2. Survey of MEng students and alumni (180 responses)
3. Interviews with executives of organizations
4. Ongoing feedback from industry through Focus Groups
5. Review of professional technical master's programs from top North American universities
6. Working Committee comprised of cross-disciplinary faculty from Applied Science and throughout the University

2.1.5. Market Insights

Consistently repeated messages were heard through all market research activities outlined above. These were:
1. Experienced engineers in industry require industry-relevant, cross-disciplinary technical skills.
2. Engineers require project management, communication and business skills to be effective leaders.
3. Few, if any, North American schools offer this combination of skills in a technical master's program.

2

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

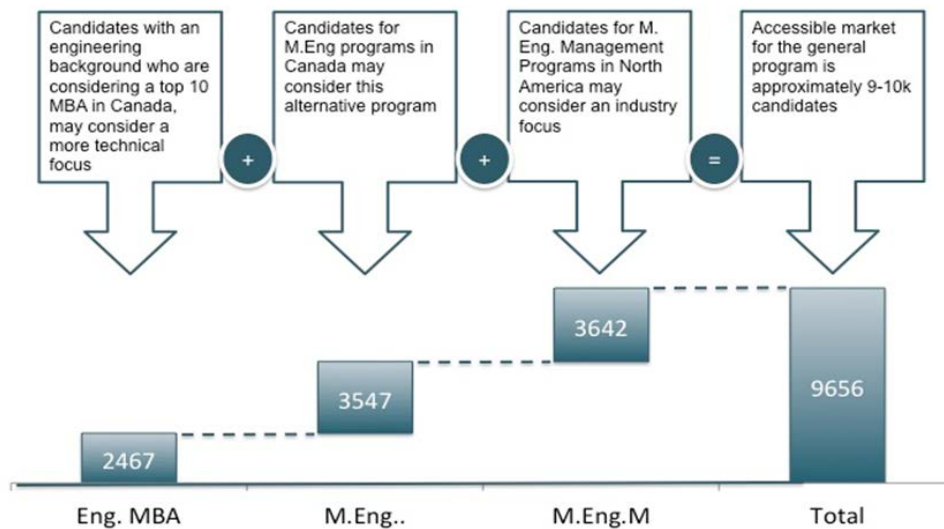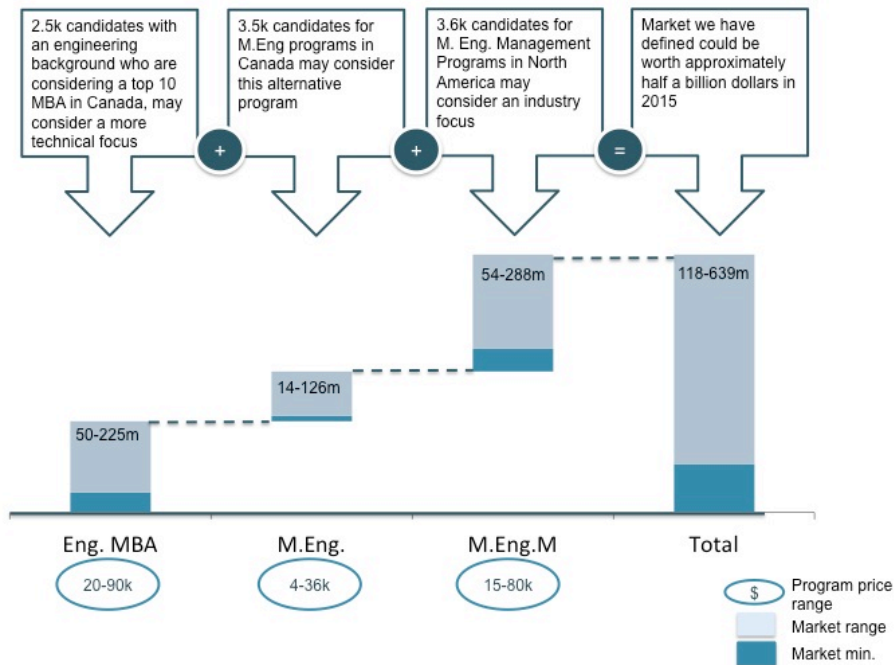Figure 1 Estimated Market Size (number of students per year)

Figure 2 Estimated Market Size ($ per year)

3

2.2. Program Objectives

2.2.1. Mission

The program strives to provide students with a comprehensive and innovative education that will enable them to advance their career in a path that is different from the traditional Applied Science course-based master's or the Master of Business Administration (MBA). The program is structured to provide a combination of advanced technical skills integrated with professional skills which will enable graduates to practice these skills and advance their career trajectory in their chosen industries.

2.2.2. Objectives

1. Equip resource engineering professionals with the critical thinking and practical skills necessary to make important contributions to their industry and to make Canada a leader in the global market.

2. Link the concerns of extra-university partners by offering students a project-based curriculum that explores cutting edge concepts in collaboration with industry professionals in BC.

3. Emerge as the leading institution for the continuing education of current leaders in resource industries and for the training of tomorrow's leaders.

4. Graduate highly skilled resource engineering professionals who can meet the demands of resource industries in Canada both now and in the future.

5. Continue to develop a high profile faculty with international expertise in the theory and practice of resource engineering management.

2.2.3. Learning Outcomes

The Master of Engineering Leadership Resource Engineering Management program will enable students to build on their work experience and technical skills, adding leadership and interdisciplinary opportunities for learning and interaction with students from a number of resource industries. After completing the Master of Engineering Leadership Resource Engineering Management program, students will be able to:

- Apply advanced project management and leadership concepts and skills to complex, multidisciplinary projects.
- Understand and apply provincial and federal laws governing resource management.
- Understand and apply technical and practical aspects of infrastructure performance.
- Understand and apply practices, techniques and methods of sustainable resource management.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

- Use leadership skills, including communication, collaboration, mediation and consensus building strategies, to advocate for positive changes and sustainable development of resources.
- Use the knowledge of models of individual and group behaviour to design efficient organizational practices and structures.
- Apply core business skills to the analysis of business issues and thereby make critical business decisions.
- Demonstrate a mastery of basic and advanced statistical methods in the context of reliability engineering and system safety.
- Identify the issues pertaining to the legal and ethical aspects of federal, provincial and territorial regulations related to resource extraction, transport and processing.
- Apply advanced life cycle assessment methods to projects, products and services in the resource industries.
- Perform risk analysis and uncertainty analysis for complex environmental systems and apply multi-criteria decision-making frameworks for risk management.
- Effectively communicate in a professional environment through a number of different mediums including written, verbal, and presentations.

2.3. Contribution to UBC Mandate and Strategic Plan

In *Place and Promise: The UBC Plan*, our vision statement is: "As one of the world's leading universities, The University of British Columbia creates an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada and the world." http://strategicplan.ubc.ca/the-plan/

The program will act as one route to the fulfillment of this promise. With the involvement of faculty from all areas in Applied Science and partner Faculties; the new state-of-the-art facilities of the UBC School of Engineering; and collaboration with industry, the program will offer an exceptional learning environment for students and for faculty undertaking research. In addition, the program will attract students from around the world to study at UBC's Okanagan's campus and graduate students who will, in turn, be in demand across the globe.

When we speak of globalization today, it is a synthesis of exploration, learning, and the global exchange of resources and knowledge–not unlike the university itself. Accordingly, the program addresses many of the goals outlined in *The UBC Plan*:

2.3.1. Student Learning

- The University provides the opportunity for transformative student learning through outstanding teaching and research, enriched educational experiences, and rewarding campus life.

5

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

The program will offer a comprehensive curriculum that draws upon the combined expertise of faculty in all areas of Applied Science and relevant partner Faculties (such as the Faculty of Management and the Irving K. Barber School of Arts and Sciences), and of industry professionals. The program will synthesize theory and practice through a challenging learning experience that will equip students with the skills and experience needed to excel in the world's most important and fast-growing industries. The number and variety of courses available to students will be purposely limited, as will student enrolment, to ensure a robust and streamlined learning experience that is centered on the program objectives. As well, strong industry support and existing relationships between UBC Applied Science and BC companies promises students both a rich educational experience and employment opportunities after graduation.

2.3.2. Innovation Excellence

- The University creates and advances knowledge and understanding, and improves the quality of life through the discovery, dissemination, and application of research within and across disciplines.

As a leading research and educational facility, UBC is expected to be a world leader, and *the* Canadian leader in the area of resource engineering management, as we invest time and resources to create, sustain and grow for the future. By expanding UBC's current scholarship in the areas of this program, UBC will not only be a leader in the exchange of knowledge in these areas; it will also, by contributing to the involved industries, be a central part of the means by which people and knowledge are mobilized.

2.3.3. Community Engagement

- The University serves and engages society to enhance economic, social, and cultural well-being.

Engaging with natural resource companies with regard to the needs of their sector is one of the key components of the program. With a curriculum grounded in collaborative community projects, a reciprocal and experiential learning environment will be created between students and industry.

2.3.4. International Engagement

- The University creates rich opportunities for international engagement for students, faculty, staff, and alumni, and collaborates and communicates globally.

The program will graduate students who will be in demand across the globe, from industries that will be based in Canada. It will graduate the trained professionals needed to ensure the self-sufficiency of Canada's industry professionals, and the global influence of Canada itself. Strong industries, backed by highly qualified professionals, are key to securing Canada's global presence – to improving and sustaining Canada's innovation and economy, and strengthening Canada's contribution to the global market. By offering the program, UBC will therefore become an invaluable player in both national and international development.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

2.4. Support for New Professional Master's Programs

The University supports the formation of new professional master's programs having goals in alignment with that of the institution. Support and resources are available in a variety of forms including assistance with market research, budgeting, and curriculum development. We have and continue to take advantage of all assistance in the creation, development, delivery and evaluation of the program.

As part of the Flexible Learning Initiative, targeted growth of professional master's programs is one of UBC's four priorities over the next five years. Continued support for the Flexible Learning Initiative has been confirmed by our UBC President. The strategic plan for flexible learning campus-wide is articulated in its own web space, which can be found here: http://flexible.learning.ubc.ca/

The Faculty of Applied Science has identified its professional Master's programs as having the potential to benefit greatly from not only revitalization, but also expansion. This initiative has been led by the Dean's office and has received consistent support from the Provost's Office through the Flexible Learning Initiative.

2.4.1. Opportunity Identification

It was felt that an opportunity may exist that had, as yet, not been explored in the Faculty of Applied Science. Given the unique structure of the faculty, which is home to not only engineering programs but also the School of Nursing, the School of Architecture and Landscape Architecture, and the School of Community and Regional Planning, it was felt that the potential existed to create a suite of interdisciplinary master's degrees that were aligned with industry in a way that a program housed in a single department or school could not. In order to establish the market for such opportunities, and to establish potential interdisciplinary themes to pursue, the following activities were undertaken:

1. Competitor scans
2. Alumni tracking
3. Ongoing dialogue with industry to identify skills gaps
4. Targeted market research / focus groups
5. Dialogue with faculty to shape opportunities and program champions
6. Initial feasibility assessment
7. Distillation of program concept(s) including clear objectives in launch
8. Straw man concept for new professional program, with clear student target

2.4.2. Program Development

Upon successful conclusion of the opportunity identification phase, program development initiated via the steps outlined below, with this document representing the basis of the material required for presentation to the School of Engineering Faculty, Okanagan Senate Committees, Board of Governors and the BC Provincial Government Ministry of Advanced Education. A key element that emerged from the opportunity identification phase was a program structure that featured a largely common platform, comprising approximately 40% of the program, which would be the foundation for all new programs. The remaining 60%

7

of the course content is then comprised of a set of courses drawn from across the faculty that provide industry specific technical content. The technical material is referred to as a 'pillar' in the remainder of this document, and because this structure was identified quite early on in the development process, it has been referred to internally as a 'Platform and Pillar' model from both the curriculum development and delivery perspectives.

1. Appointment of program champion and lead
2. Discussions with advisory committee
3. Refinement of proposition, program design and pricing
4. Definition of operating model / formation of any partnerships
5. Financial modelling
6. Funding application
7. Planning for course (re)design
8. Development of project plan
9. Presentation to School of Engineering Faculty, Okanagan Senate, Board, BC Ministry – and plan refinement as needed
10. Full program design in place
11. Approval from Okanagan Senate and BC Provincial Ministry

2.4.3. Implementation

In parallel with the approval process, implementation and launch of the new professional programs will require a significant effort well in advance of the commencement of the programs for the first cohort, which is anticipated for January 2017. Key activities are summarized here:

1. Development of course materials and flexible learning (FL) delivery / internship modules
2. Development and launch of multi-touch marketing efforts (ideally at least 1 year in advance)
3. Set up in central systems (College of Graduate Studies (CoGS), UBC Okanagan IT)
4. Evaluation of applications (ideally application deadline 7 months in advance) and submission of accepted applications to School and CoGS for approval
5. Program ready to launch with inaugural group of students

2.4.4. Program Management

Due to the intensive nature of the proposed programs and the expected audience, which would be primarily mid-career professionals, this program will require dedicated resources within the Faculty to maintain high-quality, responsive, service for administrative details surrounding the delivery of the program (e.g. registration issues, scheduling details, facilitation of workshop activities, optional co-op placements, coordination of interdisciplinary capstone projects, etc.). Additionally, it is anticipated that there be support for maintaining continuous program improvement, sufficient marketing efforts, ongoing development of community partners and industry participants, and so on. The budget for this program includes provisioning for the necessary staff, to be located in the Faculty, to ensure the ongoing support for the activities itemized below, which are regarded as necessary to deliver and maintain a program of the highest caliber:

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

1. Continuous feedback loop to improve delivery and learning outcomes
2. Refreshment of marketing materials, with relationships / channels fostered ongoing
3. Exploration / implementation of any content repurposing opportunities
4. Tracking of student success rates
5. Financial / operational management
6. Ongoing evolution of program to achieve learning, access, reputational and financial objectives

2.5. Relationship to Established Programs

2.5.1. The University of British Columbia

Many of the advanced topics that will be covered under the program are already available through programs in the involved departments and schools of Applied Science at UBC, but the program will synthesize this material and offer a more interdisciplinary approach. Existing professional programs include:

Master of Engineering (MEng)
Faculty of Applied Science, Engineering
The Master of Engineering is a non-thesis, course-based professional program designed for students who would like to further their education without pursuing research, or individuals who wish to advance their careers with enhanced technical knowledge. It normally takes 12-16 months to complete 30 credits. Students register for the MEng at the faculty level but generally complete courses within a specific department, and may take a collection of related courses that would be considered a 'specialization', although the degree is somewhat generic in that it is simply granted as an MEng in a specific department in most cases. The admission to the MEng is not cohort-based, and the entry point may be either September or January. This less specific version of the MEng is expected to continue to be offered. For some departments, this will continue to be the favored format, and for others it is expected that the programs in this proposal will evolve into the primary MEng offerings to be hosted by the department.

Master of Engineering Leadership in Naval and Marine Engineering (MEL in NAME)
Faculty of Applied Science, Engineering
The Master of Engineering in Naval and Marine Engineering is a new program bearing much in common with the new program being proposed in this document. In fact, this program, along with the Master of Engineering in Clean Energy, served very much as inspiration for the expansion of our professional master's programs, and will be incorporated into the new suite of programs.

Master of Engineering Leadership in Clean Energy Engineering (MEL in CEEN)
Faculty of Applied Science, Engineering
The Master of Engineering in Clean Energy Engineering was launched in 2009, and also bears much in common with the new program being proposed in this document in that its focus is an interdisciplinary theme. This program will be incorporated into the new suite of programs and has undergone some curriculum revision to enable the program to be structured in alignment with other offerings.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Master of Community & Regional Planning (MCRP)
Faculty of Applied Science, School of Community & Regional Planning
In the final approval stage with the Ministry, the first cohort of this new professional program is planned for September 2015. It is a two-year 48 credit program for applicants with a background in planning and community planning. Proficiency can be demonstrated through work experience and not necessarily through a bachelor's in the discipline.

Master of Science in Nursing (MSN)
Faculty of Applied Science, School of Nursing
This 33 credit program can be completed with a thesis and used as a preparation for doctoral studies or can be completed with a project. The M.S.N. program is designed to prepare graduates to function as leaders in a range of roles such as education, advanced practice, policy implementation, health care management, and nursing knowledge development.

Master of Urban Design (MUD)
Faculty of Applied Science, School of Architecture & Landscape Architecture
This program admitted the first cohort in September 2014 for applicants with a background in architecture, landscape architecture or planning that wish to pursue advanced curriculum that synthesizes urban design theory and practice. It is a 36 credit program that is normally completed in 16 months.

2.5.2. Other British Columbia and Canadian universities

There are currently no universities in British Columbia or in Canada that offer accredited *graduate* programs with the proposed Platform and Pillar structure.
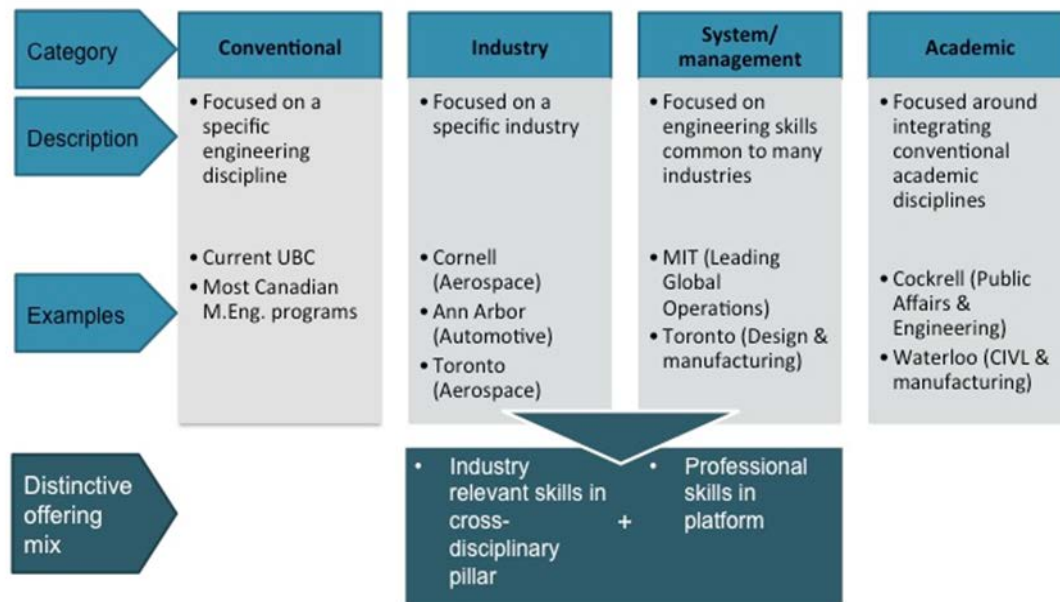
Figure 3 Assessment of Categories of Professional Engineering Master's Programs

2.5.3. Level of support and recognition from other post-secondary institutions

As a new program, support and recognition from other post-secondary institutions is limited. However, it is anticipated that participation from faculty members outside of UBC delivering content in the program will promote further support from institutions that offer similar programs both nationally and internationally. Given UBC's history of expertise in the Pillar area and the fact that UBC's engineering programs have been ranked second in the nation and among the top 50 worldwide (*Times Higher Education*), it is expected that other post-secondary institutions both in Canada and abroad will recognize and support this program.

2.6. Demand for Program

The demand for professionals with technical and integrated professional skills is growing rapidly, and Canada currently has neither the trained personnel required to meet the needs, nor the means of training them. There are currently *no* other Canadian institutions that offer industry-focused (rather than research-oriented) training at the graduate level with the proposed Platform and Pillar structure.

The demand for this program comes from multiple sides. British Columbia and Canada need the proposed program for the success of the provincial and federal Pillar industries to stay competitive with international markets. Given UBC's location, the research of current faculty, and the recent achievements of UBC undergraduate students in the Pillar areas, it is

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

appropriate that UBC be the institution to implement a graduate-level program that is lacking in Canada and now more important than ever. Representatives from resource engineering industries have communicated that resource engineers that have the ability to make business related decisions based on technical expertise and data, are desperately needed. The proposed program aims to equip students with this ability.

2.6.1. Enrolment Predictions and Capacity

Significant demand is anticipated for the new program. The desirability of an educational experience that can lead to rapid career progress upon graduation is reflected in the interest we have seen in the two existing professional Master's programs that have the most in common with the design of the proposed programs: The MEng in Naval and Marine Engineering and the MEng in Clean Energy Engineering.

To maintain a vibrant learning environment and admit the best and brightest applicants, however, the cohort size will be purposely limited to 60 students per pillar. Note that 'break-even' enrolment levels are significantly lower than this cap, and are somewhat flexible per pillar as a result of the use of the common platform.

2.6.2. Tuition Rationale

The program falls under the Faculty of Applied Science "Guidelines for Professional Programs" (August 31, 2012) that stipulates that new professional programs in the Faculty, as of January 2009, must generate revenue to cover a range of expenses including equipment, facilities and salaries of faculty and staff involved in course delivery and administration. The primary source of revenue for these programs is through the tuition flow-back from the University to the Faculty and unit delivering the program.

The starting tuition level requested for the program is $25,000 CAD for the one-year program for Canadian citizens and Permanent Residents and $40,000 CAD for the one-year program for international students requiring a Study Permit. Tuition is paid in three equal installments per year, normally in January, May and September. The student is required to pay a minimum of three installments of tuition in order to graduate, but if the program is extended by permission of the program Chair, the student pays tuition installments until the program requirements are met. For domestic students, the continuing fee and the extension fee are set by the University. No part-time studies are allowed. Currently, tuition increases by 2% each year.

We are confident that the program can attract students to pay the proposed tuition for the following reasons:

1. UBC is an acknowledged mecca for the Pillar areas.
2. A one-year program fits into the lifestyle framework for most of our potential students.
3. The program will draw from an international pool of students.
4. The tuition has been researched to be positioned in the lower cost bracket compared to programs at institutions such as MIT and Georgia Tech.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Figure 4 Comparison of Tuition within North America
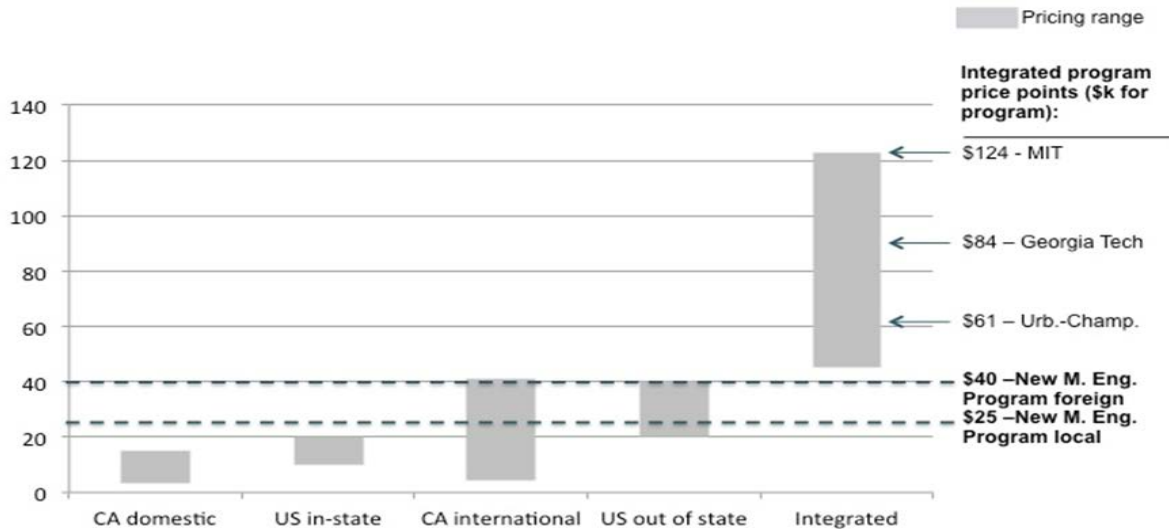
2.6.3. Scholarships

We are concerned about getting the right students for the program and recognize that the tuition assessment may be prohibitive for some outstanding applicants. As a consequence, we intend to go to industry seeking named scholarships. We feel that $10,000 CAD scholarships are a good match with the average capacity of our industry partners to contribute. A percentage of the tuition revenue will be set aside for financial need, up to 20% of the tuition (per student reserve $5,000 domestic and $8,000 international).

2.6.4. Potential Sectors of Employment for Graduates

Graduates of the program will have developed those skills and practices that industry values most highly in experienced Applied Science professionals. They will be creative and visionary to see the potential to use the knowledge and training from the program effectively in their employment choices. Government and industry are hungry for experts to develop new processes and systems to explore and implement positive changes in their chosen area. Graduates of the program can expect to find careers locally, nationally, and internationally, in a number of resource industries including: oil & gas, forestry, mining, power, and water as well as the government and academia. Given the continued importance of resource-based industries to both Canada's economy and the global economy, graduates are expected to be in high demand within Canada.

2.6.5. Opportunities for Further Study

The professional master's degree at UBC is generally not recommended for students who wish to continue on to a PhD, and the proposed program will conform to this. As such, it is anticipated that most or all of the graduating students will go on to or return to work in the industry. It is possible, however, that a small number of students will continue to PhD-level study at UBC or elsewhere.

13

3. Program Description and Specifications

3.1. Admission Requirements

Minimum admission criteria for the program will meet those of a graduate-level master's program currently in place at UBC. Applicants must hold the academic equivalent of a four-year bachelor's degree from UBC and the degree should be in a relevant discipline or equivalent. For international applicants, the English requirement should conform to a minimum IELTS score of 6.5 with no band lower than 6.0 (or TOEFL iBT score of 80). Applicants who have not fulfilled these requirements, but who have several years of relevant professional experience to offset such deficiencies, may be granted admission on the recommendation of the Program Admissions Committee.

In addition to the above requirements, students must have a background in the areas of their chosen interest. Students lacking a background in these subject areas may be required to complete additional coursework at the discretion of the APSC Dean's Office. (Table 1).

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Table 1 Admission Requirements per Pillar

Pillar	Title	Academic background	Experience	Other
1	Advanced Materials Manufacturing	BASc (MTRL, MECH, CIVL) or other equivalent engineering undergraduate degree	1-5 years relevant experience	
2	Green Bio-Products	BASc (CHBE), BSc Forestry, Chemistry or Plant Science	3 years relevant experience*	
3	Clean Energy Engineering	BASc, BSc Environmental Science + thermodynamics II	3 years experience*	
4	Dependable Software Systems	BASc Computer Eng, BSc Computer Sc	3 years relevant experience*	Coding proficiency
5	Integrated Water Management	BASc, BSc Environmental Science or equivalent	>3 years experience*	PEng eligible or equivalent
6	Resource Engineering Management (UBC Okanagan)	BASc or equivalent	3 years experience	
7	Naval Architecture & Marine Engineering	BASc	3 years relevant experience*	
8	Seniors Care	Undergraduate in healthcare-related field (BN, BSW etc.)	3 years relevant experience* At least a year in senior care	
9	Urban Systems	BASc or related degree	3 years experience*	

15

3.2. Program Requirements

The program requires a minimum of 30 credits of coursework. The distribution will be 12 credits dedicated to the platform and 18 credits dedicated to the pillar. Both the platform and the pillars have prescribed core courses. The MEL REM pillar permits students to choose six credits (two courses) from a list of approved technical electives. The program will be delivered as an intensive one-year program. It is anticipated that this will be favorable to post-professional students already in the workplace.

The program courses will involve a combination of classroom learning and integrated hands-on training. The APSC Professional Management Platform comprises 12 credits, or 40%, of the program, and provides the professional skills required for an experienced graduate to be an effective technical manager. Advanced technical courses in each Technical Pillar comprise 18 credits, or 60%, of the program.

There are eight Technical Pillars that will be available for the initial program launch of January 2016.

1. Advanced Materials Manufacturing
2. Green Bio-Products
3. Clean Energy Engineering
4. Dependable Software Systems
5. Integrated Water Management
6. Naval Architecture and Marine Engineering
7. Seniors Care
8. Urban Systems

The Resource Engineering Management program has a proposed start date of January 2017.
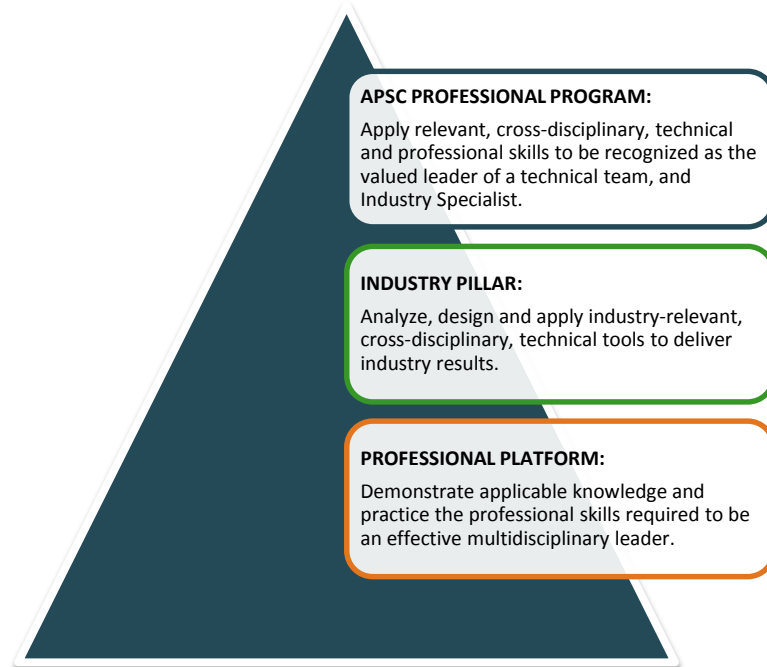
16

Figure 5 Learning Objectives Relevant to the 3 Levels of the Program

3.3. Platform Structure

3.3.1. Leadership & Sustainability (4.5 credits)

APPP 501 (1.5), APPP 502 (1.5), APPP 503 (1.5)

Learning Outcomes
1. Lead multi-disciplinary teams to effectively deliver sustainable projects
2. Articulate ideas, progress and outcomes though oral and written communications
3. Plan & deliver multidisciplinary projects
4. Identify and apply sustainability concepts to influence the triple bottom-line
5. Apply leadership principles to organizational and social change

Content
1. Project management
2. Organizational behaviour and structure
3. Sustainability, ethics and policy
4. Personal and professional leadership effectiveness & communications
5. Application of concepts to trans- disciplinary challenges in organizational and social change
6. Fully integrated into technical streams through industry-relevant projects

3.3.2. Business Foundations (3 credits)

APPP 504 (3) Business Acumen for Technical Leaders

17

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Learning Outcomes

1. Use data for business and financial decision-making.
2. Solve real-world problems with business and technical aspects in a team environment.
3. Construct business cases.
4. Determine the valuation of companies.
5. Negotiate and manage contracts.

Content

1. Basics of economics
2. Functional components of businesses
3. Fundamentals of financial accounting & applications
4. Investment project evaluation & analysis
5. Quantitative methods and management science – decision analysis & linear programming

3.3.3. Cross-cutting Themes in Industry (1.5 credits)

APPP 507 (1.5) Professional Communication
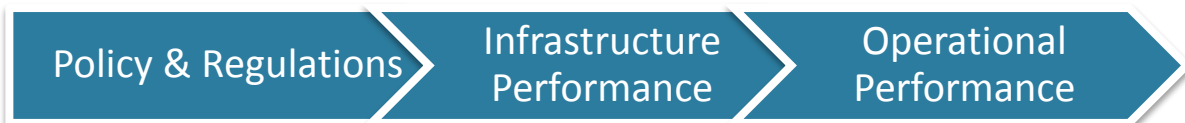
Learning Outcomes

1. Assess and understand their own and others' communication styles
2. Understand the role of gender in communication especially in STEM workplaces
3. Use a draft – revise – edit – proofread approach to prepare a variety of workplace documents, including proposals, reports, documentation, and claim letters
4. Understand the principles of "netiquette" and implement these in email and other electronic communication artifacts
5. Be aware of established and emerging social media and their effective/appropriate use in the workplace
6. Use persuasion and argument effectively and ethically in a proposal
7. Make effective communication choices and adaptations based on a variety of audiences) (including peers, readers from other professional backgrounds, and the general public
8. Understand the principles of effective cross-cultural communication
9. Work as a team lead and a team member on the communication aspects of a major project
10. Communicate difficult information clearly and effectively
11. Prepare and deliver an effective presentation using PPT
12. Prepare an agenda and run a meeting; take meeting notes and prepare minutes
13. Prepare a résumé and *curriculum vitae*, write a cover letter

3.3.4. Technical Analysis (3 credits)

APPP 515 (3) Reliability Engineering and System Safety

18

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

1. Recall classical sets theory and operation;
2. Recognise and recall probability theorems and rules;
3. Describe random variables and distribution functions;
4. Select an appropriate probability distribution function that represents observed data or underlying physical process;
5. Apply reliability modeling methods for reliability analysis of components and systems;
6. Apply advanced uncertainty techniques to assess uncertainty in reliability modeling.

3.4. Pillar –Resource Engineering Management (UBC Okanagan campus)

Value Chain

Policy & Regulations > Infrastructure Performance > Operational Performance

Learning Outcomes that Directly Map to the Value Chain
1. Understand and apply provincial and federal laws governing resource management.
2. Understand and apply technical and practical aspects of infrastructure performance.
3. Understand and apply practices, techniques and methods of sustainable resource management.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Winter Session – Term 2 (January – April)	Credits
APPP 501 Project Management and Leadership	1.5
APPP 502 Sustainability and Leadership	1.5
APPP 515 Reliability Engineering and System Safety	3
ENGR 549 Environmental Risk Analysis	3
Technical Pillar Elective	3
Summer Session – Term 1 (May – June)	
APPP 503 Organizational Leadership	1.5
APPP 504 Business Acumen for Technical Leaders	3
Summer Session – Term 2 (July – August)	
ENGR 570 Professional Resource Engineering Project	3
Winter Session – Term 1 (September – December)	
APPP 507 Professional Communication	1.5
ENGR 514 Regulatory and Societal Issues for Resource Engineers	3
ENGR 544 Life Cycle Assessment and Management	3
Technical Pillar Elective	3
TOTAL CREDITS	**30**

Professional Platform Courses (Total of 12 credits)
APPP 501 - Project Management and Leadership
APPP 502 - Leadership and Sustainability
APPP 503 - Organizational Leadership
APPP 504 - Business Acumen for Technical Leaders
APPP 507 - Professional Communication
APPP 515 - Reliability Engineering & System Safety

Technical Pillar Compulsory Courses (Total of 12 credits)
ENGR 514 - Regulatory and Societal Issues for Resource Engineers
ENGR 544 - Life Cycle Assessment and Management
ENGR 549 - Environmental Risk Analysis
ENGR 570 - Professional Resource Engineering Project

Technical Pillar Electives (Total of 6 credits)
ENGR 505 - Social Cost Benefit Analysis
ENGR 517 - Pipeline Integrity Management
ENGR 529 - Rehabilitation of Concrete Structures
ENGR 530 – Analysis and Mitigation of Geohazards
ENGR 531 - Infrastructure Management
ENGR 533 - Construction Engineering & Management
ENGR 541 - Water Resource Modeling
ENGR 578 - Corrosion Science for Resource Engineers
ENGR 588 - Process Engineering

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

3.5. Supervision and Evaluation

Unlike the graduate-level research programs at UBC, a student in the program will not be assigned a single, dedicated supervisor, but will rather be supervised day-to-day in their work by the Pillar directors and the APSC Professional Program Office. Coursework is evaluated through mini-projects, exams, homework assignments and in-class quizzes. For Pillars having a capstone project as a core component, supervision and evaluation will be provided by a professor and by industry adjuncts, while a Cooperative Education placement will be supervised mainly by the sponsoring company, and given a final mark by a UBC faculty member involved in the professional program based on the company's report and the student's final report and presentation. Expectations of students will be formalized through individual course syllabi.

3.6. Policies on Program Management and Assessment

The program will be administered under the Faculty of Applied Science. In delivering this new model "high touch" program it is essential that the Dean's Office, APSC Professional Program Office and Graduate Program Offices responsible for the Pillars collaborate and cooperate in an intimate fashion. The student should have access to all services and needs from within the same Faculty to ensure timely and comprehensive service of their academic and non-academic activities.

In parallel to internal reviews used to evaluate professional degrees conducted according to the Faculty of Applied Science and UBC governance guidelines, the program will be evaluated and developed based on the recommendations of an Advisory Committee. This expert panel of outside professionals and academics will meet once per term. Committee membership will be approved by the Dean of the Faculty of Applied Science.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

4.   Calendar Statement - Program

Curriculum Proposal Form
New Program – Okanagan Campus

Category: 1	
Faculty/School: Applied Science **Dept./Unit:** School of Engineering **Faculty/School Approval Date:** April 14, 2015 **Effective Session:** 2016S	**Date:** March 20, 2015 **Contact Person:** Dr. Richard Klukas **Phone:** 250.807.8718 **Email:** Richard.klukas@ubc.ca
Type of Action: New Master's Program	
Rationale: The creation of this program has been driven, in part, by strong interest from the external community (whereby British Columbia will see a high level of activity in the resource engineering sector over the next few decades), in part by a desire to collaborate between the Departments and Schools in the Faculty of Applied Science and in part to raise UBC's profile and to attract students (both within Canada and abroad), and to collaborate internationally.	

Proposed Academic Calendar Entry: **Master of Engineering Leadership in Resource Engineering Management M.E.L. in R.E.M.** **The objective of this program is to meet an identified need to educate engineers with a unique combination of leadership and strong technical, multi-disciplinary knowledge applicable to the resource engineering sector.** **This program is suited to students who wish to pursue their education in Resource Engineering Management beyond the undergraduate level, but who do not wish to pursue a thesis research program. This is not the appropriate program to pursue for applicants who are considering taking a Doctor of Philosophy (Ph.D.) in the future.**	**Draft Academic Calendar URL:** Add program title to table of contents: http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,981,0 program overview: http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,981,1162 new page needed for Admissions and Program requirements. **Present Academic Calendar Entry:** N/A.

22

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Completion time for program is 12 months. **Note: Completion of this degree alone does not form an acceptable basis for application to associations of professional engineers in Canada or other associated professional accreditations.** **Admission Requirements** **The program is governed by the general graduate guidelines of the College of Graduate Studies' standards for admission of students. Students admitted to the M.E.L. degree will normally possess a bachelor's degree in engineering or a related area, with a minimum GPA of B+ (76%).** **Minimum English language requirements for the M.E.L. degree include a TOEFL score of 580 (PBT) or 92 (IBT) (higher than the College of Graduate Studies minima), or an IELTS minimum overall band of 6.5 (with nothing less than 6.0 per individual test).** **Relevant professional experience is considered a significant asset and should be normally a minimum of 3 years.** **Applicants holding a four-year bachelor's degree who do not meet the admissions minima, but who have had sufficient formal training and relevant professional experience to offset the academic deficiency, may be granted admission on the recommendation of the Associate**	

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

Director of Graduate Studies in the School of Engineering. **Program Requirements** **This program requires the completion of 30 credits. This includes 12 credits of Professional Platform Courses, 12 credits of Technical Pillar Compulsory Courses and 6 credits of Technical Pillar Electives. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material and is equivalent to a specialization.** **For further information on the program, please see** Master of Engineering Leadership in Resource Engineering Management.	

5. Program Resources

5.1. Program Funding

The program will be delivered as fiscally sustainable. The budget is sensitive to enrolment numbers and has been calculated for an initial enrolment of 125 across all Master of Engineering Leadership Professional Programs and is expected to increase over 3 years to an enrolment of 300. Tuition is $25,000 per year for domestic students and $40,000 per year for international students.

5.2. Qualified Faculty

Courses will be taught by a combination of faculty from all departments and schools in APSC and also from other faculties at UBC; Visiting Professors, industry adjuncts and guest lecturers will be involved.

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

5.2.1. Pillar Champions or Directors

Each Pillar has a 'Champion', or in some cases more than one champion, who was instrumental in establishing the value proposition for the pillar and also in the design of the curriculum. It is expected that these individuals will continue to have an instrumental role in the administration and oversight of the pillars upon program launch, and may become Program Directors (see 5.4).

5.3. Library Resources

The new courses have been reviewed by the library, and the program will not require any additional Library support.

5.4. Administration

- **Program Directors**

The Directors for each pillar will be appointed by the Dean of Applied Science. The Director will lead the implementation of the program and oversee its evolution, growth and position within the Faculty of Applied Science. As well as assuming teaching and research commitments, the program Director will represent the program on university committees. The program Director will also be expected to lead the community outreach component of the program to secure internship opportunities. The Director will take an active role in developing the necessary community and industry linkages to establish a long-term and wide range of internship placements. The Director will become the principal point of contact for community and industry partners. The Director will report to the Head of the lead department as appointed by the Dean of Applied Science.

- **Program Manager**

It is expected that the suite of professional programs will be managed on a day-to-day basis by one or more centrally located program managers. This program manager would assist in: student recruitment, student enquiries, website development and maintenance, applications and admissions, timetabling, classroom scheduling, extra-curricular events and workshops, and addressing registration inquiries or issues. Support for admissions and records will also be provided by the Faculty of Applied Science Dean's Office.

5.5. Space Requirements

Classroom space will be required for the new courses developed for this program. Office space will be required for any new faculty hired for this program.

5.6. Contact Information

University of British Columbia
Faculty of Applied Science
School of Engineering
Dr. Richard Klukas

25

Associate Professor
250.807.8719
richard.klukas@ubc.ca

apso-1-MEL-REM-exec-summary-appendix-20151015-v1

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THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
New Program – Okanagan Campus

Category: **1**

Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Master's Program

Rationale: The creation of this program has been driven, in part, by strong interest from the external community (whereby British Columbia will see a high level of activity in the resource engineering sector over the next few decades), in part by a desire to collaborate between the Departments and Schools in the Faculty of Applied Science and in part to raise UBC's profile and to attract students (both within Canada and abroad), and to collaborate internationally.

Proposed Academic Calendar Entry:

Master of Engineering Leadership in Resource Engineering Management M.E.L. in R.E.M.

The objective of this program is to meet an identified need to educate engineers with a unique combination of leadership and strong technical, multi-disciplinary knowledge applicable to the resource engineering sector.

This program is suited to students who wish to pursue their education in Resource Engineering Management beyond the undergraduate level, but who do not wish to pursue a thesis research program. This is not the appropriate program to pursue for applicants who are considering taking a Doctor of Philosophy (Ph.D.) in the future.

Completion time for program is 12 months.

Note: Completion of this degree alone does not form an acceptable basis for application to associations of professional engineers in Canada or other associated professional accreditations.

Draft Academic Calendar URL:
Add program title to table of contents:
http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,981,0

program overview:
http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,981,1162

new page needed for Admissions and Program requirements.

Present Academic Calendar Entry:

N/A.

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THE UNIVERSITY OF BRITISH COLUMBIA

Admission Requirements

The program is governed by the general graduate guidelines of the College of Graduate Studies' standards for admission of students. Students admitted to the M.E.L. degree will normally possess a bachelor's degree in engineering or a related area, with a minimum GPA of B+ (76%).

Minimum English language requirements for the M.E.L. degree include a TOEFL score of 580 (PBT) or 92 (IBT) (higher than the College of Graduate Studies minima), or an IELTS minimum overall band of 6.5 (with nothing less than 6.0 per individual test).

Relevant professional experience is considered a significant asset and should be normally a minimum of 3 years.

Applicants holding a four-year bachelor's degree who do not meet the admissions minima, but who have had sufficient formal training and relevant professional experience to offset the academic deficiency, may be granted admission on the recommendation of the Associate Director of Graduate Studies in the School of Engineering.

Program Requirements

This program requires the completion of 30 credits. This includes 12 credits of Professional Platform Courses, 12 credits of Technical Pillar Compulsory Courses and 6 credits of Technical Pillar Electives. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material and is equivalent to a specialization.

For further information on the program, please see Master of Engineering Leadership in Resource Engineering Management.

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THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a required course in the technical pillar component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries.

The Canadian Engineering Accreditation Board has identified 12 graduate required attributes to the professional training of engineers. These attributes include the impact of engineering on society and the environment, individual and teamwork skills, ethics and equity and communication skills which are essential skills to cultivate in leading others in their discipline. Feedback from employers indicate that post-graduation, engineers need to continue to advance these skills to progress in their career.

This course has been developed in order to give students in this program an appreciation of the regulatory, environmental, and societal impacts of projects in the resource sector and how these impacts must be considered in the management of large and complex engineering projects.

Draft Academic Calendar URL:
www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR

Proposed Academic Calendar Entry:

ENGR 514 (3) Regulatory and Societal Issues for Resource Engineers

Canadian legal system, natural resource jurisdictions, environmental law, mining and minerals, energy sector, forestry / agriculture issues.

Present Academic Calendar Entry: N/A.

UBC a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Curriculum Proposal Form
New/Change to Course/Program – Okanagan campus

Category: **1**	
Faculty/School: School of Engineering	**Date:** 20150924
Dept./Unit: School of Engineering	**Contact Person:** Dr. Yang Cao
Faculty/School Approval Date: Oct 20, 2015	**Phone:** 250.807.9643
Effective Session: 2016S	**Email:** yang.cao@ubc.ca

Type of Action: New Course

Rationale: This new graduate-level course is a technical elective in the pillar component of the Master of Engineering Leadership in Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries. This course gives students in this professional program the opportunity to learn advanced concepts with regards to managing pipeline integrity as a part of managing and leading large and complex engineering projects in the resources sector.

Draft Academic Calendar URL:

http://www.calendar.ubc.ca/okanagan/proof/edit/courses.cfm?go=name&code=APSC

Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
ENGR 517 (3) Pipeline Integrity Assurance and Risk Assessment **Pipeline regulations and standards, data collection, risk assessment tools, hazards and threats to a pipeline system, pipeline risk management, pipeline defects and corrective actions, pipeline reliability assessment.**	N/A

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: **1**	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a technical elective in the technical pillar component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries. This course gives students in this professional program the opportunity to learn how to analyze and mitigate geohazards as a part of managing and leading large and complex engineering projects in the resources sector.

	Draft Academic Calendar URL: www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR
Proposed Academic Calendar Entry: **ENGR 530 (3) Analysis and Mitigation of Geohazards** **Identification and analysis of geological hazards such as landslides and rockfalls. Tools for geohazard characterization and evaluation. Risk assessment of specific geohazards. Selection and design of appropriate risk mitigation techniques. Case histories.**	**Present Academic Calendar Entry:** N/A.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a required course in the technical pillar component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries.

In this course students will learn the principles of life cycle assessment and management and how to apply these principles to the planning and management of large and complex engineering projects in resource engineering sector.

Proposed Academic Calendar Entry:

ENGR 544 (3) Life Cycle Assessment and Management

Practical and theoretical applications of life cycle thinking in engineering projects, products, and processes. Understand international standards and methods in Life Cycle Assessment (LCA), Life Cycle Costing (LCC). Interpret and provide critical feedback on LCA/LCC studies and analyze claims on sustainability.

Draft Academic Calendar URL:
www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR

Present Academic Calendar Entry: N/A.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a required course in the technical pillar component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries.

The Canadian Engineering Accreditation Board has identified 12 graduate required attributes to the professional training of engineers. These attributes include the impact of engineering on society and the environment, individual and teamwork skills, ethics and equity and communication skills which are essential skills to cultivate in leading others in their discipline. Feedback from employers indicate that post-graduation, engineers need to continue to advance these skills to progress in their career.

This course has been developed in order to give students in this program an opportunity to work on a relevant Resource Engineering Project and in doing so practice their newly found communication and project management skills in addition to their technical knowledge.

Proposed Academic Calendar Entry:

ENGR 570 (3) Professional Resource Engineering Project

A professional engineering design project in response to a technical engineering problem, or an engineering project management problem, in the resource engineering management sector. The project will relate to a problem experienced by the resource engineering industry. Students are required to submit a comprehensive project report and deliver a formal presentation.

Restricted to students in the Resource Engineering Management Professional Masters program.

Draft Academic Calendar URL:
www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR

Present Academic Calendar Entry: N/A.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: **1**	
Faculty/School: Applied Science **Dept./Unit:** School of Engineering **Faculty/School Approval Date:** April 14, 2015 **Effective Session:** 2016S	**Date:** March 20, 2015 **Contact Person:** Dr. Richard Klukas **Phone:** 250.807.8718 **Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a technical elective in the technical pillar component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries. This course gives students in this professional program the opportunity to learn how corrosion can affect infrastructure in resource projects as well as how the negative affects of corrosion can be managed and minimized.

	Draft Academic Calendar URL: www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR
Proposed Academic Calendar Entry: **ENGR 578 (3) Corrosion Science for Resource Engineers** **Corrosion basics; high temperature corrosion; measurement; aqueous environments; degradation; management strategies.**	**Present Academic Calendar Entry:** N/A.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: **1**	
Faculty/School: Applied Science **Dept./Unit:** School of Engineering **Faculty/School Approval Date:** April 14, 2015 **Effective Session:** 2016S	**Date:** March 20, 2015 **Contact Person:** Dr. Richard Klukas **Phone:** 250.807.8718 **Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a technical elective in the technical pillar component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries. This course gives students in this professional program the opportunity to learn the basics of process engineering and how processes can be modeled and optimized. Although very relevant to the petroleum industry, the concepts in this course can be applied to various other resource industries.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:** www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR **Present Academic Calendar Entry:** N/A.
ENGR 588 (3) Process Engineering **Process model building and its application in design and process operation. Organic, inorganic and biochemical processes, process variable identification and production processes, fundamentals of process modelling, process models and their applications, and computer-aided process design. Process optimization, process flow sheet optimization, process scheduling, process flexibility analysis and environmental considerations pertaining to various processes.**	

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This course is part of the APSC professional platform delivered in conjunction with the technical pillar in the Master of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries. Project management practices (e.g., planning, scheduling, cost estimating, risk management, quality management, etc.) are the central form of management practiced in many of these industries, and is a valuable and relevant subject in the others. As such, this course addresses a foundational subject for the program.
The course will be delivered with some elements that are common to project management in all disciplines (e.g., lectures on project management principles and theory), and some elements that are applied to the individual industries that make up the Resource Engineering Management program (e.g., industry-specific case studies).

This course is an existing course on the Vancouver Campus and is currently being offered by the Sauder School of Business. Students in the Master of Resource Engineering Management professional program will take this course on the Okanagan Campus.

Proposed Academic Calendar Entry:

APPP 501 (1.5) Project Management and Leadership

Leading complex multidisciplinary projects through management processes; project management frameworks, standards; core management processes of planning, scheduling, estimating, survey of communication, risk, and management issues; case studies in industry-relevant project management.

Restricted to students in the Master of Engineering Leadership Professional Program.

Draft Academic Calendar URL:
www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR

Present Academic Calendar Entry: N/A.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This course is part of the APSC professional platform delivered in conjunction with the technical pillar in the Master of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries. This course is required to train professional engineers in the resource engineering sector to incorporate sustainability into the planning and management of large and complex engineering projects, and to lead in the area of sustainability.

The Canadian Engineering Accreditation Board has identified 12 graduate required attributes to the professional training of engineers. These attributes include the impact of engineering on society and the environment, individual and teamwork skills, ethics and equity and communication skills which are essential skills to cultivate in leading others in their discipline. Feedback from employers indicate that post-graduation, engineers need to continue to advance these skills to progress in their career.

This course is an existing course on the Vancouver Campus and is currently being offered by the Sauder School of Business. Students in the Master of Resource Engineering Management professional program will take this course in on the Okanagan Campus.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:**
APPP 502 (1.5) Sustainability and Leadership	www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR
Skills for leading change that influence triple-bottom-line; sustainability, change agent systems thinking; awareness and perspective for engagement and communication; adaptive leadership; change dynamics; cases studies in organizational and social change.	**Present Academic Calendar Entry:** N/A.
Restricted to students in the Master of Engineering Leadership Professional Program.	

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This course is part of the APSC professional platform delivered in conjunction with the technical pillar in the Master of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries.

This course is required to equip professional engineers, who typically have had little or no formal education in business administration, with the knowledge and skills to be effective managers of people within their organization. It was strongly suggested during many of the Industry Feedback sessions that students learn about organizational structure as they are training to be the next level of management and thus need to be exposed to standardized and industry-accepted leadership tools and models.

The Canadian Engineering Accreditation Board has identified 12 graduate required attributes to the professional training of engineers. These attributes include the impact of engineering on society and the environment, individual and teamwork skills, ethics and equity and communication skills which are essential skills to cultivate in leading others in their discipline. Feedback from employers indicate that post-graduation, engineers need to continue to advance these skills to progress in their career.

This course is an existing course on the Vancouver Campus and is currently being offered by the Sauder School of Business. Students in the Master of Resource Engineering Management professional program will take this course in on the Okanagan Campus.

Proposed Academic Calendar Entry:	**Draft Academic Calendar URL:**
APPP 503 (1.5) Organizational Leadership	www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR
Behavior of people and groups and its application to management and leadership within professional organizations; motivation, group dynamics, and organizational structure; leadership styles and effectiveness; assessing organizational effectiveness.	**Present Academic Calendar Entry:** N/A.
Restricted to students in the Master of Engineering Leadership Professional Program.	

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca
Type of Action: New Course	

Rationale: This course is part of the APSC professional platform delivered in conjunction with the technical pillar in the Master of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries.

Business acumen is an asset to the aspiring technical leader. It is the knowledge of how business works and the application of that knowledge for the purpose of business improvement. It offers an elevated perspective of how technical skills contribute to building value in a business. This course immerses aspiring technical leaders in the practical application of core business skills through preparation and familiarization in the six core business competencies as modules: Managerial Accounting; Strategy and Performance; Market Evaluation; Operations Management; Negotiations and Contract Management; Business-Case Building and Valuation.

The Canadian Engineering Accreditation Board has identified 12 graduate required attributes to the professional training of engineers. These attributes include the impact of engineering on society and the environment, individual and teamwork skills, ethics and equity and communication skills which are essential skills to cultivate in leading others in their discipline. Feedback from employers indicate that post-graduation, engineers need to continue to advance these skills to progress in their career.

This course is an existing course on the Vancouver Campus and is currently being offered by the Sauder School of Business. Students in the Master of Resource Engineering Management professional program will take this course in on the Okanagan Campus.

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Proposed Academic Calendar Entry:	Draft Academic Calendar URL:
APPP 504 (3) Business Acumen for Technical Leaders **Opportunity to tackle real-world problems in high-performing teams and present targeted solutions for assessment. Managerial accounting; strategy and performance; market evaluation; operations management; negotiations and contract management; business-case building; valuation.** **Restricted to students in the Master of Engineering Leadership Professional Program.**	www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR **Present Academic Calendar Entry:** N/A.

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Curriculum Proposal Form
New Course – Okanagan Campus

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Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course

Rationale: This new course is a required course in the professional platform component of the Masters of Resource Engineering Management professional program. The premise of this program is to combine technical specialization with applied leadership and management training relevant to resource industries.

This course has been developed in order to equip students with the specific written and oral communication skills required to lead and manage complex engineering projects in resource industries.

Draft Academic Calendar URL:
www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR

Proposed Academic Calendar Entry:

Present Academic Calendar Entry: N/A.

APPP 507 (1.5) Professional Communication

Written and oral communication in professional engineering environments; principles and application of communication theory in the technical professional workplace.

Restricted to students in the Master of Engineering Leadership Professional Program.

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Curriculum Proposal Form
New Course – Okanagan Campus

Category: 1	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date: April 14, 2015	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: New Course/Code

Rationale: This new course is a required course in the professional platform component of the Masters of Resource Engineering Management professional program. The equivalent course ENGR 415/515 is already offered on our campus. To be consistent in the professional platform course offerings we would like to offer this course under the APPP (Applied Science Professional Platform) course code.

	Draft Academic Calendar URL: www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR
Proposed Academic Calendar Entry:	**Present Academic Calendar Entry:**
APPP 515 (3) Reliability Engineering and System Safety	N/A.
Reliability, maintainability, and availability of systems, failures models and probabilistic risk analysis, failure mode effect analysis, fault tree analysis and event tree analysis, reliability and system improvement using design of experiments, Taguchi-based methods, quality function deployment. Credit will be granted for only one of APPP 515, ENGR 415 or ENGR 515.	
	Present Academic Calendar Entry:
Proposed Academic Calendar Entry:	ENGR 515 (3) **Reliability Engineering and System Safety**
ENGR 515 (3) **Reliability Engineering and System Safety**	Reliability, maintainability, and availability of systems, failures models and probabilistic risk analysis, failure mode effect analysis, fault tree analysis and event tree analysis, reliability and system improvement using design of experiments, Taguchi-based methods, quality
Reliability, maintainability, and availability of systems, failures models and probabilistic risk analysis, failure mode effect analysis, fault tree analysis and event tree analysis, reliability and system improvement using design of	

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experiments, Taguchi-based methods, quality function deployment. **Credit will be granted for only one of ENGR 515, ENGR 415 or APPP 515.** **Proposed Academic Calendar Entry:** ENGR 415 (3) **Reliability Engineering and System Safety** Reliability, maintainability, and availability of systems, failures models and probabilistic risk analysis, failure mode effect analysis, fault tree analysis and event tree analysis, reliability and system improvement using design of experiments, Taguchi-based methods, quality function deployment. [3-0-0] **Credit will be granted for only one of ENGR 415, ENGR 515 or APPP 515.**	function deployment. ~~Credit will not be granted for both ENGR 515 and ENGR 415.~~ **Present Academic Calendar Entry:** ENGR 415 (3) **Reliability Engineering and System Safety** Reliability, maintainability, and availability of systems, failures models and probabilistic risk analysis, failure mode effect analysis, fault tree analysis and event tree analysis, reliability and system improvement using design of experiments, Taguchi-based methods, quality function deployment. ~~Credit will not be granted for both ENGR 415 and ENGR 515~~. [3-0-0]

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Curriculum Proposal Form
New Course Code – Okanagan Campus

Category: **1**	
Faculty/School: Applied Science	**Date:** March 20, 2015
Dept./Unit: School of Engineering	**Contact Person:** Dr. Richard Klukas
Faculty/School Approval Date:	**Phone:** 250.807.8718
Effective Session: 2016S	**Email:** Richard.klukas@ubc.ca

Type of Action: Requesting New Course Code

Rationale: This course code will be used to designate the professional platform courses in our new Professional Masters Program. APPP stands for Applied Science Professional Platform and is consistent with the corresponding courses offered on the Vancouver campus. The professional Platform courses will be delivered in conjunction with the technical pillar courses for the Master of Engineering Leadership in Resource Engineering Management program on the UBCO campus.

The premise of this program is to combine technical specialization with applied leadership and management training relevant to the target industries. Project management practices (e.g., planning, scheduling, cost estimating, risk management, quality management, etc.) are the central form of management practiced in many of these industries, and is a valuable and relevant subject in the others. The courses will be delivered with some elements that are common to project management in all disciplines (e.g., lectures on project management principles and theory), and some elements that are applied to the individual industries that make up the Resource Engineering Management program (e.g., industry-specific case studies).

Proposed Academic Calendar Entry: **APPP** **Applied Science Professional Platform**	**Draft Academic Calendar URL:** www.calendar.ubc.ca/okanagan/courses.cfm?code=ENGR **Present Academic Calendar Entry:** N/A.

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Office of the Senate
Brock Hall | 2016 - 1874 East Mall
Vancouver BC V6T 1Z1

Phone 604 822 5239
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www.senate.ubc.ca

13 November 2015

To: Senate
From: Nominating Committee
Re: Committee Appointments

The Senate Nominating Committee has received a request from the President to appoint two senators (one faculty member, one student) to a President's Advisory Committee for the Extension of the Appointment of the Vice-President Students, and a request from the Vice-President Research & International to appoint one faculty member to a President's Advisory Committee for the Extension of the Appointment of the Associate Vice-President Research & International. The former extension is not currently covered by any policy of the University; the latter extension is pursuant to Policy 24.

The Nominating Committee would recommend that Senate resolve as follows:

> *That Dr Robert Lalonde and Ms Shira Sneg be appointed to the President's Advisory Committee for the Extension of the Appointment of the Vice-President Students; and*
>
> *That Dr Lawrence Berg be appointed to the President's Advisory Committee for the Extension of the Appointment of the Associate Vice-President Research & International.*

Secondly, the Senate Nominating Committee notes that the new senator for Applied Science, Dr Andrew Phillion, does not yet have any committee assignments. The Committee would therefor recommend:

> *That Dr Andre Phillion be appointed to the Senate Curriculum Committee, effective until 31 August 2017 and thereafter until replaced, to fill a vacancy.*

Finally, the Committee has received a request from the student senators to adjust their committee assignments in light of their new members of Senate. The Nominating Committee would recommend that Senate resolve as follows:

> *That Senate make the following appointments to committees of Senate and the Council of Senates, effective until 31 March 2016 and thereafter until replaced:*
>
> *Lawrence Watt, Council Budget Committee, to fill a vacancy.*
> *Lawrence Watt, Academic Policy Committee, to fill a vacancy.*
> *Lindsay Farrugia, Admission & Awards Committee, to fill a vacancy.*
> *Nishat Tasnim, Learning & Research Committee, to fill a vacancy.*
> *Leo Tan, Senate Agenda Committee, to fill a vacancy.*

Respectfully submitted,

Dr Daniel Keyes, Chair

Senate Nominating Committee