

**Vancouver Senate****THE FIRST REGULAR MEETING OF THE VANCOUVER  
SENATE****FOR THE 2018/2019 ACADEMIC YEAR****WEDNESDAY, 19 SEPTEMBER 2018****6:00 P.M.****ROOM 182, IRVING K. BARBER LEARNING CENTRE,  
1961 EAST MALL**

1. Welcome – Dr Santa J. Ono (information)
2. Senate Membership

## New Members:

Dr Simon Bates, Director of Continuing Education, to replace Dr Hugh Brock (retired)

Dr Meigan Aronson, Dean of the Faculty of Science, to replace Dr Simon Peacock (end of term)

## Resignation:

Dr Thomas Schneider (Faculty Representative, Faculty of Graduate and Postdoctoral Studies). A by-election has been called.

## Nominating Committee:

Due to the resignation of Dr Schneider, there is a vacancy on the Senate Nominating Committee. This is a call for nominations for one (1) non-student member of Senate to serve on the Senate Nominating Committee until 31 August 2020 and thereafter until replaced. Nominations are due by 4 pm on Thursday, 4 October 2018. If more than one senator is nominated, an election will be held at the October meeting of Senate in accordance with Rule 26 (f) of the *Rules and Procedures of Senate*.

3. Minutes of the Meeting of 16 May 2018 – Dr Santa J. Ono (approval) (docket pages 5-40)
4. Business Arising from the Minutes – Dr Santa J. Ono (information)
5. Remarks from the Chair and Related Questions – Dr Santa J. Ono (information)



## 6. From the Board of Governors – Dr Santa J. Ono (information)

Confirmation that material from the following meetings and email consent items as approved by Senate were subsequently approved by the Board of Governors as required under the *University Act* (information):

### **17 January 2018**

New awards

### **28 February 2018**

New Awards

New programs: Master of Urban Forestry Leadership, Master of Science in Medical Physics, Doctor of Philosophy in Medical Physics, Bachelor of Science in Food Resource Economics, and the Tec de Monterrey certificates.

Curriculum proposals from the faculties of Applied Science, Arts, Commerce and Business Administration, Education, Forestry, Graduate and Postdoctoral Studies, and Land and Food Systems.

2018-2019 enrolment targets

Establishment of a Chair (In Camera)

### **23 March 2018:**

New awards

### **18 April 2018:**

New awards

New certificate: Dechinta Community and Land-based Research Certificate

Curriculum proposals from the faculties of Applied Science, Arts, Graduate and Postdoctoral Studies, and Forestry

Merger of the Faculty of Education (Vancouver) with the Faculty of Education (Okanagan) to form the Faculty of Education,, establishment of Okanagan and Vancouver divisions of the Faculty of Education, establishment of the Okanagan School of Education, consequential changes to appointments, units, programs, and courses.

NB: The new certificate: Dechinta Community and Land-based Research Certificate is still pending Board approval.

**16 May 2018:**

New awards

Curriculum proposals from the faculties of Applied Science, Arts, Graduate and Postdoctoral Studies, and Science

Establishment of the Emeritus College

**July 2018:**

Curriculum proposals from the Faculty of Graduate and Postdoctoral Studies

**7. Candidates for Degrees – Dr Santa J. Ono (approval)**

The list as approved by the faculties of Dentistry, Graduate & Postdoctoral Studies and Medicine is available for advance inspection at the Senate Office, 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 of Dentistry, Graduate and Postdoctoral Studies and Medicine be granted the degrees for which they were recommended, effective September 2018 or as otherwise noted, and that a committee comprised of the Registrar, the dean of the relevant faculty, and the Chair of the Vancouver Senate be empowered to make any necessary adjustments.*

*(2/3 majority required).*

**8. Tributes Committee – Dr Paul Keown**

Memorial Minute for Dr William Watson (approval) (docket pages 41-42)

**9. Awards Committee – Dr Lawrence Burr**

- a. Revisions to Policy V-200: Student Awards (approval) (docket page 43-69)
- b. New and Revised Awards (approval) (docket pages 70-85)

**10. Joint Report of the Admissions and Curriculum Committees – Prof. Carol Jaeger**

New Program: Bachelor of Science in Forest Bioeconomy Sciences and Technology (approval) (docket pages 86-166)

**11. Curriculum Committee – Prof. Carol Jaeger**



- a. Ratification of Material Approved in the Summer Months (approval) (docket pages 167-232)
  - b. New Certificates: Graduate Certificate in Global Mine Waste Management, Graduate Certificate in Higher Education (information) (docket pages 233-266)
12. From the Registrar – Dr Kate Ross  
Confirmation of Email Consent to Nominating Committee Recommendations for Appointments to President’s Advisory Committees (information) (docket page 267)
13. Other Business
14. IN CAMERA – Honorary Degree – Dr Paul Keown



# VANCOUVER SENATE

MINUTES OF 16 MAY 2018

**DRAFT**

## Attendance

**Present:** Dr S. Ono (Chair), Dr K. Ross (Secretary), Dr P. Adebar, Mr T. Ahmed, Dr R. Boushel, Dr H. Brock, Dr L. Burr, Ms P. Chan, Mr A. Chen, Dr A. Collier, Dean M. Coughtrie, Dr A. Dulay, Mr B. Fischer, Dean B. Frank, Dr J. Gilbert, Dr C. Godwin, Dr V. Griess, S. Mr Haffey, Ms M. Hamid, Dr P. Harrison, Mr M. Holmes, Dean J. Innes, Dr M. Isaacson, A. Dr Ivanov, Prof. C. Jaeger, Dean D. Kelleher, Dr M. Kuus, Dr K. Lo, Ms A. MacDougall, Mr K. Madill, Ms J. Malone, Mr B. McNulty, Dr A. Murphy, Dean J. Olson, Mr N. Pang, Dr S. Parker, Dean S. Peacock, Prof. A. Sheppard, Ms A. Shilling, Dr S. Singh, Mr A. Starr, Dr A. Szeri, Ms A. Tanner, Dr R. Tees, Dr M. Thachuk, Dr S. Thorne, Dr R. Topping, Dr M. Upadhyaya, Ms H. Xiao

**Regrets:** Dean G. Averill, Ms V. Braithwaite, Dr V. Bungay, Dean C. Dauvergne, Dr G. Falkner, Dr A. Fisher, Dr S. Forwell, Mr J. Gattinger, Ms A. Glinsbockel, Mr Q. Goldsteyn, Chancellor L. Gordon, Ms K. Gourlay, Dr J. Greenman, Dean R. Helsley, Dr A. Kindler, Dr M. Koehoorn, Dr C. Krebs, Mr H. Leong, Mr M. Leuprecht, Dr P. Loewen, Dr D. MacDonald, Dr C. Marshall, Dr P. Marshall, Dr S. Matsui, Dr W. McKee, Dr P. Meehan, Ms S. Ngo, Dr C. Nislow, Dean S. Porter, Dr T. Rogers, Mr T. Schneider, Dr J. Shepherd, Mr M. Stewart, Dr . Stothers.

**Clerk:** Mr C. Eaton

## Call to Order

The Chair of Senate, Dr Santa J. Ono, called the ninth regular meeting of the Vancouver Senate for the 2017/2018 Academic Year to order at 6:03 pm.

## Senate Membership

### NOMINATING COMMITTEE

The Registrar advised that as a result of the call for nominations issued at the previous meeting, Mr Jakob Gattinger and Ms Ainsley MacDougall have been acclaimed elected to the Senate Nominating Committee until 31 March 2019 and thereafter until replaced.

**VICE-CHAIR OF SENATE**

Mr Jakob Gattinger was acclaimed elected as vice-chair of Senate for a term of no more than one (1) year.

**Minutes of 18 April 2018**

Ricchard Tees	}	<i>That the Minutes of the Meeting of 18 April 2018 be adopted as corrected.</i>
Anthony Sheppard		

*Corrections:**Senator Ivanov was present.**Senator Philip Loewen seconded the Awards**Report**Typographical error in Senator Burr's statement  
on awards.*

Approved

**Business Arising from the Minutes**

Senator Malone reminded the Senate that there was a report on faculty appointments to the School of Biomedical Engineering was due in accordance with the resolution made by Senate when the school was approved.

**Remarks from the Chair**

The President noted that the past academic year had been significant for the university. More importantly the approval of the new strategic plan. He expressed his looking forward to working with the Senate on its implementation. Dr Ono also highlighted the Blue and Gold campaign for student financial aid and the opening of the Indian Residential School History and Dialogue Centre along with the apology made on behalf of UBC for our role in the residential school system. He also mentioned the installation of bilingual (English and Halkomelem street signs on campus, the appointment for four internationally-recognized Canada 150 Research Chairs, increased provincial funding for tech training, UBC's success in the digital supercluster proposal, and the opening of our new School of Public Policy and Global Affairs, the National Soccer Development Centre, and the Chan Gunn Pavilion.

The President concluded his remarks by expressing his hope to see senators at graduation ceremonies in the next two weeks.



## Candidates for Degrees

Max Holmes  
Carol Jaeger

}

That the candidates for degrees and diplomas, as recommended by the faculties, be granted the degrees for which they were recommended, effective May 2018, and that a committee comprised of the Registrar, the dean of the relevant faculty, and the Chair of Senate be empowered to make any necessary adjustments.

Approved

## Council Budget Committee

The Chair of the Vancouver Sub-Committee of the Council Budget Committee, Dr Perry Adebar, presented.

## ANNUAL REPORT

As this year is the start of a new triennium the Committee spent considerable time orienting the new members and discussing possible discussion topics over the three years.

The Committee met relatively regularly over the course of the 2017-18 academic year with the Provost and Vice-President Academic, the Vice-President Finance and Operations, the Comptroller, and the Director of Academic Initiatives from the Office of the Provost and Vice-President Academic. In addition, other guests attended individual meetings in order to deliver presentations or provide input on specific issues.

The Committee met six times in 2017-18, including one joint meeting with the Senate Academic Building Needs Committee. Meetings are held immediately prior to the main Senate meetings. Meetings typically begin with a 30-minute meeting of Senators alone, followed by presentations and discussions with representatives of the administration, and other guests.

The agendas for the meetings of the Vancouver Sub-Committee are developed in collaboration with the Office of the Provost and Vice-President Academic and the Office of the Vice-President Finance and Operations.

The topics addressed by the Committee during the 2017-18 academic year include the following:

1. Work Plan for the Office of the Provost and Vice-President, Academic  
Presenter: Andrew Szeri, Provost



Summary: Provost highlighted current priorities such as supporting the Strategic Planning process; supporting strategic aspirations of faculties; promoting academic and research excellence; recruiting world-class faculty; housing action plan; major IT projects; International; Extended Learning and others. Committee discussion included: the aforementioned items, as well as conservative hiring of young faculty and accumulation of sizeable carry-forwards; tuition levels for professional programs, and; international student tuition.

## 2. Overview of Budget Process for Upcoming Year

Presenter: Ian Burgess, Comptroller

Summary: For the benefit for the new members of the Committee, high-level information was provided about the budget, including operations, research and capital, revenue from government and tuition. The annual budget process was described, including the role the Committee plays at a later stage when a “strawman” budget has been drafted.

## 3. Key Priorities for the Office of the Vice-President, Finance and Operations

Presenter: Andrew Simpson, Vice-President, Finance and Operations

Summary: High-level objectives are to build financial capacity, develop a world-class campus and, deliver operational excellence. Need to develop increased revenue and reduce costs. Campus planning: capital project delivery process; seismic upgrading of buildings. Large enterprise system overhaul for student, HR and financial information systems; continue implementation of Uniforum.

## 4. Brief Overview of Capital Planning Process – Joint Meeting with Senate Academic Building Needs Committee

Presenter: John Metras, Associate Vice-President, Campus Facilities Summary: a dynamic process involving input from many groups including Senate Academic Building Needs Committee; recommendations go to Executive who draft five-year capacity plan for approval by Board of Governors and submission to Ministry.

## 5. Recently Completed and On-going Capital Project Presenter: Pam Ratner, Vice-Provost and Associate Vice-President, Enrolment and Academic Facilities

Summary: Six recently completed projects and four on-going projects were briefly discussed.

## 6. Financing of Capital Projects Presenter: John Metras, Associate Vice-President, Campus Facilities

Summary: Academic building projects have multiple funding sources including government, fundraising, self-funding and university (faculty or central) contributions. Discussion topics included: current debt for capital projects, student housing, new classrooms, faculty housing, how government contributions have changed over recent years, and optimization of rooms for examinations.

## 7. Update on Priorities for the Office of Vice President Finance & Operations

Presenter: Peter Smailes, Interim Vice-President, Finance & Operations





Summary: Four priorities set out in VPFO Strategy 2020 will continue as planned. Develop financial capacity – endowment modelling is being reviewed. World-class campus – deferred maintenance, new capital plan. Operational excellence – Integrated Systems Project, a finance project with IT implications. Responsible management – sharing best practices, developing a more robust long-term financial plan.

#### 8. Budget Process Update and Operating Budget Presentation

Presenter: Ian Burgess, Comptroller

Summary: Discussion focused on a few specific areas of interest to the Committee. Over half of increase to operating fund from international student tuition increases. Most allocated to faculties, remainder goes to Excellence Fund, which is allocated primarily on a short-term (not permanent) basis.

#### 9. Budget 2018/2019

Presenter: Andrew Szeri, Provost and Vice-President Academic

Summary: University is in a relatively healthy financial position. Provincial government has agreed to fund GWI and has agreed to fund additional seats. One concern is the possibility of a new payroll tax being introduced to compensate for the elimination of MSP premiums. Proposed allocations to be made with increased revenue were discussed.

#### 10. Discussion of Budget Model

Summary: Advantages and disadvantages of the current UBC Budget Model were discussed. The Excellence Fund has helped to distribute revenue from international student tuition to faculties that do not have access to international student tuition revenue. The general consensus is that the model is working reasonably well at the university level. Different faculties have very different budget models for allocations within the faculties.

#### 11. Update on Rapid Transit

Presenter: Michael White, Associate Vice-President, Campus & Community Planning

Summary: The extension of the Millennium Line extension from Arbutus to UBC was presented. The costs and the economic and academic benefits to UBC were discussed.

#### 12. Update on Capital Projects

Presenter: John Metras, Associate Vice-President, Campus Facilities

Summary: The Capital Planning Principles were briefly reviewed, and the list of the top 15 priority projects for UBC and/or provincial government funding were reviewed. The issue of new classroom space was discussed.

#### 13. Update on Government Business Enterprise

Presenter: Peter Smailes, Interim Vice-President, Finance & Operations

Summary: The University is considering the establishment of a Government Business Enterprise (GBE), which will be a subsidiary of the university. The GBE would be able to obtain financing, separate from the university, to build student housing.



Senator Hamid asked on the Committee's thoughts on GBE and funding allocations.

Dr Adebar replied that it wouldn't be appropriate to speak to specific matters.

The Vice-President Finance & Operations *Pro Tem.*, Mr Peter Smailes, advised that we are still early in that process, but our initial thoughts are similar to the excellence fund.

## **Budget Presentation**

The Vice-President Finance & Operations *Pro Tem.*, Mr Peter Smailes, presented on the budget.

Senator Holmes noted that this was the first year where tuition was contributing more to our budget than the government operating grant. He asked what this would mean for UBC.

Mr Smailes said that he expected this trend to continue, especially with international tuition, without which we would be struggling.

Dr Szeri said that the province would view this as a UBC Centric picture that ignores various expenses that are incurred to support BC students generally.

Senator Holmes said in past years there was a 2:1 ratio of faculty priorities to student support and now we have gone to 4:1. What is the rationale?

Dr Szeri said that some expenditures planned for this year were shifted to next year. He further noted that faculty hiring was time sensitive.

Senator Holmes said that when discussing the GBE if implemented that it would be worrisome if this was modelled on the excellence fund. In particular, he mentioned a concern about recurring faculty retention funding coming out of the excellence fund.

Senator Singh said that in the past three years, the grant percent has gone from 33% to 30% and tuition has been an opposite trend. Do we have a three year projection on where we expect to go with our grant to tuition ratio? Secondly, are we letting the government know that this is not workable given the amount of criticism we get in the media for increasing international enrolment.

The President replied that in the US this trend occurred much earlier. Universities went from 30% to as low as 5% and there is intense pressure on development offices and with tuition to balance budgets. We are continuously lobbying the province and the federal government for funding. It is hard to project this out as government priorities can change.

Senator Singh lamented that healthcare was able to always get more funding; education seems to be a lower priority.



## Topic of Broad Academic Interest

### COST OF DIGITAL LEARNING MATERIALS

The Chair of the Senate Teaching & Learning Committee, Dr Andre Ivanov, introduced the topic and its two presenters, Dr Simon Bates and Mr Max Holmes.

Dr Bates defined the topic as online assessment or work that students must pay access to complete coursework.

Mr Holmes went over AMS data on textbook activities from their Academic Experience Survey. He then proposed four principles for consideration and discussion:

1. Students should know the full cost of courses at the time of or, ideally, before registration.
2. Assessment activities are a core part of tuition and costs for access to additional (digital) assessment materials should be limited
3. Texts and digital assessment materials should be available for purchase unbundled.
4. Costs for texts and other materials should be affordable or alternative affordable options should be made available.

Senator Sheppard asked what would be affordable options?

Dr Bates said that the most affordable option and the one being used more and more at UBC was open resources. We are saving \$2.2M a year for students but we have to recognize for some courses that good quality freely available open texts do not exist.

Senator Sheppard noted that preparation of teaching materials does not carry much clout in the tenure and promotion process.

Dr Bates said that this was changing; creation of materials was now carrying increasing weight in processes.

Senator Innes asked if the use of the flopped classroom model was exacerbating this issue.

Dr Bates said that the main use of online homework was assessment while the flipped approach was to provide content ahead.

Mr Holmes said that one thing contributing is publishers are getting smarter; to get more sales they are bundling materials. Students complain, but if a professor requires a text the publishers don't care.



Dr Bates said that last summer we were working with students on the transition from connect to canvas. A student noted that he was being charged \$150 to be able to submit his homework for a course. There is no UBC policy that would prohibit a faculty member from outsourcing all of their assessment to a publisher.

Senator Haffey asked barriers existed to making full costs known at registration.

Dr Bates said that from time to time faculty would change as would their use of textbooks. We could likely attain 80% accuracy but not 100%. He further noted that these were rapidly maturing assessment systems. Publishers have adaptive systems and machine learning algorithms.

Senator Jaeger spoke in support of the initiative. She asked about personal response systems like clicker. She asked if there was a correlation between piracy and tuition costs.

Mr Holmes said that the AMS reached out to other schools. Institutions that had controls in place had less demand for pirated materials and lower material costs overall.

Senator Murphy said that for term 2 courses knowing the full costs would be difficult 9 months in advance. She spoke in favour of the online components in some classes.

Senator Lo also spoke in favour of online tools. He suggested that a lot of these went well beyond assessment and those online assessments supported academic integrity for quantitative courses.

Mr Holmes said it was a question of how much we wanted to be outsourcing our teaching.

Senator Pang spoke in favour of limiting costs. He asked what the barriers would be towards these principles and if we had ideas to help with that.

Dr Bates said that the best systems were amazing; however, the quality of publisher provided question banks was highly variable and this was where the expertise of the faculty member was important. He raised the Geography “textbook sprint” work as an example. Half a dozen faculty wrote a textbook in 4 days: BC Geography in a Global Context.

Senator Pang said that he valued some excellent online resources but the costs were sometimes prohibitive. He noted that some instructors made their assessments optional and reweighted things for those who cannot afford then.

Dr Ono noted that at his previous institution they had such principles and they had a positive effect.



The Provost suggested that if too much of the course material went online, students were only renting access as opposed to having it on an ongoing basis. He suggested that we needed a principle for preservation of access.

Dr Bates said that this was time-limited access was exactly what the publishers wanted.

Senator Isaacson said that there was extremes and diversity across campus. He suggested that we shouldn't overregulate but that students should be aware of costs upfront and that the way to do this was in course syllabi.

Senator Hamid said that digital materials can be beneficial and of quality, but there were economic equity concerns around increased costs. She suggested that this was an access to education issue.

Senator Singh said that some digital assessment tools improved learning, but we needed to find a way to reduce costs. Can we as a university be involved rather than leaving these decisions to instructors?

Dr Bates said that we had regular conversations with publishers but they will just contact faculty directly.

Senator Singh said that this culture could be changed.

The President said that beyond just institutions consortia have tried for at least a decade.

Senator Thatchuk asked why campus-wide licenses did not cover these resources, otherwise he noted his agreement with the students who spoke. He asked why these costs were paid by students instead of through the university.

The President said that this was a non-trivial contractual matter

Senator Harrison said that the syllabus policy this will be included, but this is too late as students want the data upon registration not the start of the class.

Senator Malone said that while this came up from digital materials a lot of these points could equally apply to physical materials as well.

Senator Gilbert said that this was extremely useful report on a difficult topic. He noted that the AMS data showed huge inequity that led to huge inequality. The difficult question is what is "affordable"?

Senator A. MacDougall said a question is what is actually needed noting sometimes very expensive textbooks are listed as required but are barely used.



Senator Tees underlined that this has been a long battle with publishers. He noted that one idea at the time was for the universities to take over journal publishing. Maybe we could do the same and have the university take a more active role in taking over creation of digital materials.

The President said that need to think about this for our resource allocation and priorities. He suggested that UBC had the ability resources and the will to build upon this conversation.

### **Academic Building Needs Committee**

The Chair of the Senate Academic Building Needs Committee, Dr Michael Isaacson, presented.

#### **ANNUAL REPORT**

The Senate Academic Building Needs Committee (SABNC) undertakes a significant portion of its activities through it being consulted on a wide range of relevant plans, projects, and topics. Such consultations occur in three ways:

1. Through presentations to the SABNC.
2. Through presentations to the Property and Planning Advisory Committee (PPAC). (All SABNC members are members of PPAC; the SABNC Chair is Vice-Chair of PPAC.)
3. Through meetings of the Capital Planning Working Group (CPWG). (The SABNC chair is a member of CPWG.)

Beyond the Committee's roles in being consulted in these ways, the Committee undertook the following activities:

- Upon request of the Senate Agenda Committee, the Committee developed a position with respect to the availability of its meeting minutes.
- The Committee reviewed its Terms of Reference and developed an associated statement of clarification to guide its activities.
- The Committee developed a work plan with respect to three topics:
  - Sustainability, including creating / protecting green spaces
  - Impact of building design on the mental health and wellbeing of students, faculty, and staff
  - Learning space utilization

The first two of these were considered through relevant presentations to the Committee.

The third is a more complete study that will extend into the fall of 2018.

- The Committee sought from the Provost information regarding the disposition of the recommendations in the Committee's May 2017 report to Senate: "University's Capital Projects Prioritization and Approval Process." The Committee welcomed and appreciated the Provost's response, including reference to the participation of the Committee Chair as a member of the Capital Projects Working Group.

- The Committee has been consulted on modifications to the "Booking Guidelines for



General Teaching Space", and has thereby contributed to an update to these guidelines. Overall, during the 2017-18 academic year, the Committee held 7 meetings, including a joint meeting with the Vancouver Sub-Committee of the Council of Senates Budget Committee, and participated in 6 meetings of PPAC. In addition, on behalf of the Committee, the Chair attended two meetings of CPWG and one meeting with Enrolment Services.

### Academic Policy Committee

Dr Paul Harrison, Chair of the Senate Academic Policy Committee, presented.

#### GRADUATE AND POSTDOCTORAL STUDIES - EXAMINATIONS, MASTER'S THESES, AND DOCTORAL DISSERTATIONS

Paul Harrison	}	<i>That Senate approve the proposed revisions to the Faculty of Graduate and Postdoctoral Studies Academic Calendar section on Examinations, Master's Theses, and Doctoral Dissertations as set out in the attached form.</i>
Richard Tees		

Approved

#### UNDERGRADUATE BIOMEDICAL ENGINEERING PROGRAM - TRANSFER OF PROGRAM ADMINISTRATION

Paul Harrison	}	<i>That Senate approve the transfer of administration of the undergraduate Biomedical Engineering Program from the Faculty of Applied Science to the School of Biomedical Engineering, and That the School of Biomedical Engineering Calendar entry be revised as set out in the attached form.</i>
James Olson		

Dr Harrison noted that was always the intent but this was not yet possible when the School was approved.

Approved

### Admissions Committee

The Chair of the Senate Admissions Committee, Professor Carol Jaeger, presented.

#### MASTER OF URBAN DESIGN - CHANGE IN ANNUAL SCHEDULE



**Affiliation Agreement: TRANSFOR-M: Transatlantic Master Programs Leading to a European and a Canadian degree in Forestry, Environmental and Conservation Sciences**

**Doctor of Philosophy in Biomedical Engineering – Changes in Admission Requirements**

**Master of Applied Science in Biomedical Engineering – Changes in Admission Requirements**

Carol Jaeger  
Anthony Sheppard

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*That Senate approve a change to the annual schedule for students enrolled in the Master of Urban Design program, to run from 1 May until 30 April, effective for the 2019-2020 Academic Year (1 May 2019) and thereafter.*

*That Senate approve, and recommend to the Council of Senates and Board of Governors for approval, the terms of the affiliation agreement on TRANSFOR-M: Transatlantic Master Programs Leading to a European and a Canadian degree in Forestry, Environmental or Conservation Sciences, as set out in the “Memorandum of Understanding Between Albert-Ludwigs-University Freiburg, Bangor University (Wales), University of Eastern Finland, University of Natural Resources and Life Sciences Vienna, and University of Padova (Collectively, the “EU Members”) and University of New Brunswick, University of Alberta, University of British Columbia, and University of Toronto (Collectively, “the Canadian Members”)*

*That Senate approve changes in admission requirements for applicants to the Doctor of Philosophy in Biomedical Engineering, effective for admission to the 2018 Winter Session and thereafter.*

*That Senate approve changes in admission requirements for applicants to the*





*Master of Applied Science in Biomedical Engineering, effective for admission to the 2018 Winter Session and thereafter.*

Approved

### **Policies J-51, J-52, and J-53**

Carol Jaeger  
Anthony Sheppard

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*That Senate approve Policy J-51.1: Admission Based on Interim Grades for Applicants following Canadian Extra-Provincial Criteria, effective for admission to the 2019 Winter Session;*

*That Senate approve revisions to the 'Criteria for Including Secondary School Courses in an Admission Average,' effective for admission to the 2019 Winter Session and thereafter;*

*That Senate approve Policy J-52.2: Admission for Secondary School Applicants Following the BC/Yukon Curriculum, effective for admission to the 2019 Winter Session; and*

*That Senate approve Policy J-53.1: Course-Specific Minima for Secondary School Applicants, effective for admission to the 2019 Winter Session and thereafter.*

Prof Jaeger noted that these are consequential changes to enable resolutions passed earlier this year.

Approved

### **Annual Report on Appeals and Other Matters of Delegated Authority**

#### **POLICY J-50: SECONDARY SCHOOL GRADE ADJUSTMENTS FOR UNDERGRADUATE ADMISSION TO THE UNIVERSITY**



In December 2009, Senate approved Policy J-50: *Secondary School Grade Adjustments for Undergraduate Admission to the University*. For the purposes of undergraduate direct-entry admission to the University, grades reported for secondary school applicants outside of the BC/Yukon secondary school curricula may be adjusted to accurately assess those grades in terms of their ability to predict future performance at the University.

To date, the policy has been applied to applicants from Alberta secondary schools. For entry to the 2017 Winter Session grades presented for admission were adjusted upwards by 4%.

**STUDENT MOBILITY AGREEMENTS APPROVED UNDER COUNCIL OF SENATES POLICY C-2:  
AFFILIATIONS WITH OTHER INSTITUTIONS OF LEARNING**

Under Policy C-2: *Affiliations with Other Institutions of Learning*, the Council of Senates has delegated to the Admissions Committee the authority to approve on its behalf, terms of student mobility agreements for students going to or coming from UBC Vancouver programs.

Since its last report to Senate, the Admissions Committee has approved student mobility agreements with the following institutions:

Nanyang Technical University, Singapore (all UBC Vancouver faculties)  
 Sciences Po Lyon (UBC Faculty of Arts)  
 Julius Maximilian University of Würzburg (UBC Faculty of Science)  
 Trinity College, Dublin (all UBC Vancouver faculties)  
 Kyoto University (all UBC Vancouver faculties)  
 Bogor Agricultural University (UBC Faculty of Forestry)  
 Deakin University (all UBC Vancouver faculties)  
 Yale-National University of Singapore (UBC Faculty of Arts)  
 Griffith University (UBC Faculty of Applied Science)  
 Bauhaus-Universität Weimar (UBC Faculty of Arts)  
 University of Mannheim (UBC Faculty of Commerce and Business Administration)  
 UBC and Tohoku University (TU) (all UBC Vancouver faculties)  
 University of the Arts London (UAL)( UBC Faculty of Arts)  
 Yale-National University of Singapore (Yale-NUS) (UBC Faculty of Arts and Faculty of Science)  
 Southwest University, China (all UBC Vancouver Faculties)  
 TRANSFOR-M: Transatlantic Master Programs Leading to a European and a Canadian degree in Forestry, Environmental and Conservation Sciences [Albert-Ludwigs-University Freiburg, Bangor University (Wales), University of Eastern Finland, University of Natural Resources and Life Sciences Vienna, and University of Padova (Collectively, the “EU Members”) and University of New Brunswick, University of Alberta, University of British Columbia, and University of Toronto]

**APPEALS ON APPLICATIONS FOR ADMISSION, RE-ADMISSION AND TRANSFER TO PROGRAMS**

Pursuant to section 37(1)(b) of the *University Act*, the Vancouver Senate has conferred on the Senate Admissions Committee the power to hear final appeals on applications for admission and re-admission to the University. The Admissions Committee also reviews and rules on appeals related to applications for admission/transfer to a Degree or Program.

Between 1 May 2017 and 30 April 2018, the Admissions Committee heard 126 appeals:

123 appeals for admission to the University  
1 appeal for readmission to the University  
2 appeals for change of degree or program

Of the 126 appeals heard by the Committee, 12 were allowed and 115 were dismissed. As outlined in the Calendar, the Committee may allow an appeal where it decides that a faculty or school may have overlooked or misinterpreted information provided by the applicant, or arrived at a decision without reasonable consideration of mitigating circumstances, or acted contrary to the faculty's published procedures.

As noted in previous reports to Senate, the volume of appeals has increased substantially over the past few years. Despite this increase, the reasons for refusal or revocation have remained relatively stable: in the last two years, the most common reason was applicants failing to meet the University's English language admission standard, followed by applicants failing to meet competitive thresholds and/or University minimum admission requirements. Although the Committee is hearing more appeals, the acceptance rate did not increase proportionately, possibly because the most common reasons for refusal or revocation are based on policies that are quite clear.

At its May 2015 meeting, Senate approved a revised policy on admission appeals which clarified the process and detailed the various routes an appeal may follow. The process distinguishes between appeals for admission versus those for revocations of offers of admission. It provides greater clarity and guidance for potential appellants through standardized forms enumerating the types of documents required to substantiate an appeal. These changes enable appellants to put forward more complete appeals from the outset, and to facilitate improved communication among faculties, Enrolment Services, the Senate Admissions Committee and the appellant. The Committee is of the opinion that direct communication of the right to appeal coupled with a streamlined process has likely contributed to the dramatic increase in the number of appeals submitted.

In May 2017, Senate approved the Committee's request for a reduction in quorum for the consideration of admission appeals. The majority of the Committee's business during the Summer Session is related to admission appeals for the upcoming Winter Session and the Committee often has difficulty reaching quorum during the summer months as many members are away from campus for prolonged periods. Given the number of appeals considered by the



Committee each summer, the vast majority of which are considered between June and August, Senate approved a reduced quorum for the consideration of appeals, lowered from five (5) members of the Committee who are members of the Vancouver Senate to three (3) members of the Committee who are members of the Senate.

It is expected that the number of appeals considered for entry to 2018 Winter Session will remain relatively stable. With a more holistic approach to admission, effective for entry to the 2019 Winter Session, the hope is that there will be fewer revocations of conditional offers of admission. The elimination of the English 12 provincial examination may also impact the number of appeals. In the absence of grading information on the Graduation Literacy Assessment, it is difficult to anticipate the impact, if any, on the number of admission appeals.

#### **NOMINAL CHANGES TO ADMISSION REQUIREMENTS AND EDITORIAL CHANGES TO CALENDAR LANGUAGE**

In May 2013, Senate delegated to the Committee final right of approval over nominal changes in admission requirements and editorial changes to Calendar language. From May 2017 until April 2018, the Committee has approved 33 proposals under delegated authority (compared to 25 proposals in the previous reporting period), 17 of which were nominal changes to admission requirements and 16 were student mobility agreements, as per Council of Senates Policy C-2: *Affiliations with Other Institutions of Learning*.

#### **Committee on Appeals on Academic Standing**

The Chair of the Committee, Professor Anthony Sheppard, presented.

#### **ANNUAL REPORT**

Dr Sheppard noted that for privacy reasons he couldn't give particular details of the committee's work beyond those provided in its written report. A total of seven (7) appeals were heard by the Committee since it last reported in May 2017: two were allowed, one was allowed in-part, and four were dismissed. In addition to those heard, a further 15 appeals were filed with the registrar over the past year: three of these were settled prior to a hearing, 1 was withdrawn by the appellant, six were closed due to lack of action by the appellant to further the matter, one was sent back to the Faculty for a final decision, and four were in the processes of being scheduled.

#### **Awards Committee**

The Chair of the Senate Awards Committee, Dr Lawrence Burr, presented. He thanked the members of the awards committee for their work this year.

#### **Awards Report**

*See Appendix A: Awards Report*



Lawrence Burr  
Marium Hamid

} *That Senate accept the awards as listed and forward them to the Board of Governors for approval; and that letters of thanks be sent to the donors.*

Approved

### Revisions to Policy V-200

Lawrence Burr  
Anne Murphy

} *That Senate approve Policy V-200.1: Student Awards, effective 1 September 2018.*

Dr Burr noted that this policy was approved in May 2014 as an interim policy. Discussions have been ongoing since, and a draft revised policy was approved but consultation is ongoing. A comprehensive revision will be proposed in 2018/19. A more limited revision is being made now in advance of the academic year, a reduction in the minimum require credits from 27 to 24.

Approved

### Curriculum Committee

The Vice-Chair of the Senate Curriculum Committee, Professor Carol Jaeger presented.

#### MAY CURRICULUM PROPOSALS

*See Appendix B: Curriculum Report*

Carol Jaeger  
Santokh Singh

} *That the new courses, removal of program, new dual degree program, and new minor, brought forward by the faculties of Applied Science, Arts, Graduate and Postdoctoral Studies (Applied Science, Arts, and Forestry), and Science be approved."*

A student senator asked about the changes to CHEM 100. She asked if there had been communication with regards to CHEM 100 being a pre-requisite for other courses.

Prof. Jaeger said that Dr Scaman from Land and Food Systems was consulted.



Dr Thatchuk said that CHEM 100 was not intended to be a general introduction chemistry course; CHEM 111 was.

The student senator asked when the CHEM100/111 course exam will be taken so students knew how to register.

Senator Thatchuk said that the courses were scheduled at the same time to avoid registration problems.

Approved

### Senate Library Committee

The Chair of the Senate Library Committee, Dr Lawrence Burr, presented.

#### ANNUAL REPORT

Dr Burr noted the committee's delight with the new university librarian, Susan Parker, and thanked Berringer and Burton for serving as acting university librarians. The Committee thanked the Librarians and Library staff, the senate office, and student members

### Senate Nominating Committee

The Chair of the Senate Nominating Committee, Dr Richard Tees, presented.

#### APPOINTMENTS TO COMMITTEES OF SENATE AND THE COUNCIL OF SENATES

Richard Tees  
Mark Thatchuk

}

*That Mr Nick Pang, Mr Austin Chen, and Ms Katie Gourlay be appointed to the Senate Academic Building Needs Committee: Committee until 31 March 2019 and thereafter until replaced, to replace Ms Simran Brar, Ms Lisa Wang and Ms Danika Coulbourn;*

*That Mr Max Holmes and Ms Jeanie Malone be appointed to the Senate Academic Policy Committee until 31 March 2019 and thereafter until replaced, to replace Mr Kevin Doering and Mr Francisco Gallegos;*



*That Mr Alexander Starr and Ms Hannah Xiao be appointed to the Senate Admissions Committee until 31 March 2019 and thereafter until replaced, to replace Ms Jaymi Booth and Mr Qadeem Salehmohamed;*

*That the terms of Mr Jakob Gattinger, and Mr Max Holmes on the Senate Agenda Committee be extended to 31 March 2019 and thereafter until replaced;*

*That Ms Priscilla Chan, and Ms Jeanie Malone be appointed to the Senate Committee on Appeals on Academic Standing until 31 March 2019 and thereafter until replaced, to replace Mr Michael Pratt and Ms Lisa Wang, and that the term of Ms Amber Shilling be extended to 31 March 2019 and thereafter until replaced; That Mr Nick Pang, Mr Quentin Golsteyn, Ms Amber Shilling, Ms Priscilla Chan, and Ms Hannah Xiao be appointed to the Senate Curriculum Committee until 31 March 2019 and thereafter until replaced, to replace Ms Jayme Booth, Mr Max Holmes, Ms Ainsley MacDougall, Mr Daniel Lam, and Ms Amber Shilling; That Ms Ainsley MacDougall, Mr Jakob Gattinger, and Ms Danika Colbourn, be appointed to the Senate Library Committee until 31 March 2019 and thereafter until replaced, to replace Ms Simran Brar, Mr Daniel Lam, and Mr Michael Wong, and that the term of Ms Alexandra Glinsbockel be extended to 31 March 2019 and thereafter until replaced;*

*That Ms Alexa Tanner be appointed to the Student Appeals on Academic Discipline Committee until 31 March 2019 and thereafter until replaced, to replace Ms Madison Grist and that the terms of Ms Ainsley MacDougall and Mr Qadeem Salehmohamed be extended to 31 March 2019 and thereafter until replaced;*

*That Ms Katie Gourlay and Mr Austin Chen be appointed to the Senate Awards Committee until 31 March 2019 and thereafter until replaced, to*



*replace Ms Madison Grist and Ms Sarah Park. That Mr Max Holmes, Ms Alexa Tanner, and Mr Matthais Leuprecht be appointed to the Senate Teaching and Learning Committee until 31 March 2019 and thereafter until replaced, to replace Ms Danika Coulbourn, Mr Kevin Doering, and Ms Marium Hamid;*

*That Mr Alexander Starr, and Mr Quentin Golsteyn be appointed to the Senate Tributes Committee until 31 March 2019 and thereafter until replaced, to replace Mr Michael Pratt and Ms Alexandra Glinsbockel;*

*That Ms Jeanie Malone be appointed to the Senate Ad-Hoc Committee on Academic Diversity and Inclusivity until 31 March 2019 and thereafter until replaced, to replace Mr Jakob Gattinger, and that the non-Senate seat held by Ms Malone be declared vacant; That Mr Matthais Leuprecht and Ms Marium Hamid be appointed to the Council of Senates Budget Committee: until 31 March 2019 and thereafter until replaced, to replace Mr Jakob Gattinger and Mr Francisco Gallegos;*

*That Mr Jakob Gattinger be appointed to the Council of Senates Elections Committee until 31 March 2019 and thereafter until replaced, to replace Ms Miranda Huron; and That Ms Jeanie Malone be appointed to Council of Senates Representative Committee Four to replace Ms Simran Brar.*

Approved

## **PRESIDENTIAL SEARCH PROCEDURES**

Dr Tees reminded the Senate that his committee had been working with its Okanagan counterparts and the Board of Governors on ongoing procedures for presidential searches at UBC. He hoped this document would be ready for consideration by September.

## **Committee on Student Appeals on Academic Discipline**





The Chair of the Committee, Mr Tariq Ahmed, presented.

#### **ANNUAL REPORT**

Mr Ahmed advised that during the period from 1 May 2017 to 30 April 2018, the Senate Committee heard two (2) appeals involving students disciplined by the President upon the recommendation of the President's Advisory Committee on Student Discipline. Both appeals were dismissed as set out in the Committee's written report.

Senator Sheppard asked for the distinction between academic standing and academic discipline.

Mr Eaton advised that only the President could discipline students, however, faculties could make academic decisions based on conduct in professional programs if authorized to do so by the Senate in their academic regulations.

#### **Teaching and Learning Committee**

The Chair of the Committee, Dr Andre Ivanov, presented.

#### **ANNUAL REPORT**

#### **UNDERGRADUATE RESEARCH WORKING GROUP**

By request of student senators, discussions were revisited regarding undergraduate research opportunities at UBC, particularly as the new Strategic Plan prioritizes broader access to student research experiences, including developing new opportunities for undergraduate research.

The committee approved the formation of the Undergraduate Research Working Group at their January meeting. The goal of this working group is to implement an action framework in regards to undergraduate research opportunities at UBC.

Two meetings have occurred have occurred to date. A Current State document was brought forward and reviewed by the working group. Next steps include taking the Current State, to the Associate Deans, Research and Associate Deans, Academic meetings for input and review.

#### **UBC STRATEGIC PLAN AND THE INDIGENOUS STRATEGIC PLAN**

At the October meeting, the Provost came to present the UBC Strategic Plan and the Committee provided input. In April, Dr. Linc Kesler presented to the Committee the new Indigenous Strategic Plan. While the current strategic plan builds on the Aboriginal Strategic Plan from 2009, there is recognition that the current landscape concerning indigenous issues has changed. Numerous international and national developments, such as the adoption of the UN Declaration as well as the Truth and Reconciliation Commission, have come into effect. The current plan



gives an assessment of what that landscape means, in terms of the external lay of the land and also in terms of what exists at UBC as a platform for which to extend the next steps of development.

### DIGITAL LEARNING COSTS

The Committee discussed the costs of digital learning materials over several meetings and a Topic of Broad Academic Interest was reviewed at the meeting in April. Costs of these materials have increased annually and for some students, these costs contribute to their financial burden. Currently, neither the provincial government nor UBC has policies in place to reduce or limit the cost of texts or digital learning resources. In contrast, both Ontario and Alberta do. The TBAI outlined possible directions UBC could take.

### OTHER MATTERS

In addition, presentations were given in regards to the Emerging Media Lab (by Claudia Krebs and Matt Yedlin) and Reconciliation in Action: Insights from the Community (by Annelies Tjebbes).

### Reports from the Provost

#### ESTABLISHMENT OF A UBC EMERITUS COLLEGE

Andrew Szeri  
Richard Tees

} *That Senate approve and recommend to the Board of Governors the establishment of the Emeritus College;*

*That the governance and administration of the Emeritus College be as set out in the attached document;*

*That the Principal of the College report to the Senate on the status of the College annually until 2022 and thereafter as Senate may direct; and*

*That the Senate Nominating Committee consider that the Principal of the Emeritus College be added to the voting membership of Senate as an ex officio, voting member, as allowed under Section 35.1 (2)(k) of the University Act.*

The President noted that he had encouraged and supported this proposal.



Senator Malone asked about the addition of more members to the Senate and if this would affect its efficacy.

Dr Tees advised that this would be part of the Nominating Committee's discussions.

Approved

#### QUALITY ASSURANCE PROCESS AUDIT REPORT

Andrew Szeri John Gilbert	}	<i>That Senate endorse the approach taken in the draft QAPA Institutional Report as attached, and that a final draft be reviewed and approved by the Senate Curriculum Committee, prior to the report's submission to the Ministry in summer 2018.</i>
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The Provost introduced the Vice-Provost Academic Affairs, Dr Eric Eich, to present.

Dr Eich outlined that the Ministry of Advanced Education had tasked the provincial Degree Quality Assurance Board with ongoing quality assessment. Institutions are to be audited every 8 years. Simon Fraser and Vancouver Island universities were audited as pilot projects.

Senator Thatchuk asked who the auditors are.

Dr Eich said we don't know yet.

Senator Tees asked if the Ministry themselves had a plan for follow ups.

Dr Eich said yes but those plans change frequently.

Approved

#### Tributes Committee

The Chair of the Senate Tributes Committee, Dr Sally Thorne, presented.

#### CANDIDATES FOR EMERITUS STATUS

Sally Thorne Amber Shilling	}	<i>That the attached list of individuals for emeritus status be approved and that, pursuant to section 9(2) of the University Act, all persons with the</i>
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*ranks of Professor Emeritus, Associate Professor Emeritus, Assistant Professor Emeritus, Professor of Teaching Emeritus, Senior Instructor Emeritus, General Librarian Emeritus, Administrative Librarian Emeritus or Program Director Emeritus be added to the Roll of Convocation.*

Approved

### **Adjournment**

Seeing no other business, the meeting was adjourned at 8:19 pm.



## **Appendix A: Awards Report**

### **NEW AWARDS – ENDOWED**

#### **Keluarga Bendl Bursary**

Bursaries totalling \$2,000 have been made available through an endowment established by Christopher Bendl, along with matching funds from The University of British Columbia, to undergraduate students at the university. Chris graduated with a B.Sc. in 1991 and has been an active alumni volunteer since 1994, when he was co-head of the UBC Young Alumni Connections. Over the past 20 years he has remained an engaged alumnus, helping to engage fellow alumni throughout Asia, and serving as a board member of the Alumni Association. The bursaries are adjudicated by Enrolment Service. (First award available in the 2018/2019 winter session.)

#### **Building the Future in Medicine Bursary**

Bursaries totalling \$2,000 have been made available through an endowment established by faculty and staff members of the Faculty of Medicine, along with matching funds from the University of British Columbia, for M.D. undergraduate students. In the spirit of the Building the Future 2016-2021 Strategic Plan, and the Blue & Gold Campaign for Students, the Faculty of Medicine believes that all aspiring students should have the same opportunity to fulfil their dreams of pursuing a medical education. The bursary is adjudicated by Enrolment Services. (First award available in the 2018/2019 winter session).

#### **Undergraduate Chemistry Society Research Laboratory Experience Excellence Award**

Two awards of \$750 each have been made available through an endowment established by the Department of Chemistry's Undergraduate Chemistry Society in May 2018. The awards are for undergraduate students who are undertaking research coursework in their graduating year outside of a thesis project. Awards will be given to reflect the range of sub-disciplines in the department; two awards in the same sub-discipline will only be given in exceptional circumstances. Preference will be given to students who demonstrate excellence based on their oral presentation and their ability to answer questions about their research. The awards are made on the recommendation of the Department of Chemistry. (First award available in the 2018/19 winter session.)

#### **Professor Bonnie J. Craig Award in Dental Hygiene**

A \$1,200 award has been made available through an endowment established by Professor Bonnie J. Craig, founding Director of the Dental Hygiene Degree Program, to a dental hygiene degree student entering 4th year who demonstrates a combination of extraordinary innovation and creativity in addressing oral health disparities in underserved communities, exemplary professionalism, and strong academic achievement. Professor Craig has dedicated 50 years of service to the Dental Hygiene profession and is known among colleagues and students for her leadership, vision and program development, and teaching excellence. The award is made on the recommendation of the Faculty of Dentistry. (First award available in the 2018/19 winter session).

**Walter David Duerksen Memorial Scholarship in Electrical Engineering**

A \$1,600 scholarship has been made available through an endowment established by Isabelle Duerksen, in memory of her husband, Walter David Duerksen (B.A.Sc. 1951) for an undergraduate electrical engineering student who is entering the final year of study.

Recommendations are made by the Department of Electrical and Computer Engineering in the Faculty of Applied Science. (First award available in the 2018/19 winter session.)

**Professor Jean Laponce Memorial Prize in Political Science**

A \$1,400 prize has been made available through an endowment established by friends and family in memory of Professor Jean Laponce to an undergraduate honours student in the Department of Political Science who presents the best thesis. Professor Emeritus Jean Laponce joined UBC in 1956 as the university's first full-time political scientist. He directed the UBC political science honours program and left an indelible mark not only on the university, but also on the broader political science community. UBC awarded Professor Laponce with an honorary degree (LL.D. honoris causa) in recognition of his long service. The award is made on the recommendation of the Department of Political Science. (First award available in the 2017/18 winter session.)

**Helsa Leong Memorial Graduate Award in Chemical and Biological Engineering**

A \$1,200 award has been made available through an endowment established by family and friends in memory of Mrs. Helsa Leong, who was a staff member for over thirty-five years in the Department of Chemical and Biological Engineering and a pillar of the graduate programs within the department. The award is offered to an outstanding graduate student in Chemical and Biological Engineering, with preference given to those who have demonstrated leadership and community service. The award is made on the recommendation of the Department of Chemical and Biological Engineering in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**Mrs. Frances E.R. Maplethorp Award**

A \$1,850 award has been made available through an endowment established by Mrs. Frances E.R. Maplethorp to a student in an orthodontic graduate program. The award has been created to honour the family's legacy of involvement with UBC and in the dental profession. In addition to academic merit, the award is offered to the student who best exhibits professionalism, initiative, ethical behaviour and good patient motivational skills. Preference will be given to a second-year graduate masters student. The award is made on the recommendation of the Faculty of Dentistry in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**Anne Piternick Graduate Scholarship in the Faculty of Arts**

Scholarships totalling \$6,000 have been made available through an endowment established by Anne Piternick, with funding from the Faculty of Arts, for First Nations, Inuit or Métis graduate students of Canada, who are pursuing a graduate degree within the Faculty of Arts.

Recommendations are made by the Faculty of Graduate and Postdoctoral Studies in consultation



with the Faculty of Arts and the First Nations House of Learning. (First award available in the 2017/2018 winter session.)

### **Petersen Family Women's Varsity Award**

One or more awards, which may range from a minimum value of \$500 each to the maximum allowable under athletic association regulations, are offered to female varsity student athletes in any year of study, with preference that at least one award go to an athlete on the women's soccer team. Awards are made on the recommendation of the Athletics Awards Committee. (First award available in the 2018/2019 winter session.)

### **Sumaila-Volvo Graduate Prize in Environmental Sustainability**

A \$4,000 prize has been made available through an endowment established by Dr. Rashid Sumaila upon being named the 2017 Volvo Environment Prize laureate, for a Master's or Ph.D. student whose peer-reviewed publications to date are expected to have the most significant impact on the field of environmental sustainability. Preference is given to students supervised by faculty members who are affiliated with the Institute for the Oceans and Fisheries; the Institute for Resources, Environment and Sustainability; or the School of Public Policy and Global Affairs. The prize is made on the recommendation of the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/2019 winter session.)

## **NEW AWARDS – ANNUAL**

### **Arts Internship Student of the Year Award**

A \$1,000 award is offered annually to a student in the Arts Internship Program (AIP) who has made the most significant impact and meaningful contributions to the AIP, Faculty of Arts and community throughout their internship experience. The Arts Internship Program offers undergraduate Arts students the opportunity to expand their knowledge, experience, networks, and potential future career success through volunteer internships with non-profit organizations in the Lower Mainland. The award is made on the recommendation of the Faculty of Arts, in consultation with the Center of Student Involvement and Careers. (First award available in the 2018/19 winter session).

### **Canadian Society of Hospital Pharmacists of British Columbia Award**

Two awards of \$500 each are offered annually by the Canadian Society of Hospital Pharmacists (CSHP), BC Branch to students entering the fourth year of the Entry to Practice PharmD program with high academic achievement, current CSHP membership, and a demonstrated interest in hospital pharmacy. The award is made on recommendation of the Faculty of Pharmaceutical Sciences. (First award available in the 2018/2019 winter session.)

### **Connor, Clark & Lunn Foundation Award for Women in Finance**

A \$5,000 award is offered annually to a female undergraduate student in the Bachelor of Commerce program specializing in Finance at the Sauder School of Business who has demonstrated academic excellence. Financial need may be considered. The award is made on the



recommendation of the Sauder School of Business. (First award available in the 2018/2019 winter session.)

**Fraser Litigation Group Scholarship for Excellence in Law**

A \$1,500 scholarship is offered annually by Fraser Litigation Group to a J.D. student in the Peter A. Allard School of Law who demonstrates academic excellence. Preference will be given to J.D. students with a connection to the Cariboo Regional District of BC. The scholarship is made on the recommendation of the Peter A. Allard School of Law. (First award available in the 2018/19 winter session.)

**Gudmundseth Mickelson LLP Litigation Counsel Award in Law**

A \$2,500 award is offered by Gudmundseth Mickelson LLP to a student entering the second or third year of the J.D. program who has demonstrated academic excellence and a demonstrated interest in litigation. This award is made on the recommendation of the Peter A. Allard School of Law. (First award available in the 2018/2019 winter session.)

**Stephanie MacKinnon UBC Women's Rugby Award**

One or more awards, which range from a minimum value of \$500 each to the maximum allowable under athletic association regulations, have been made available to the women's rugby team in recognition of Stephanie MacKinnon. While attending UBC, Stephanie was a member of the Thunderbird Women's Rugby team and graduated in 2017 with a Bachelor of Applied Science in Chemical Engineering. Stephanie was known for her leadership, hard work and will to battle through adversity. This award will be given to UBC Thunderbird Women's Rugby student-athletes who exemplify courage and leadership. The award is made on the recommendation of the Athletics Awards Committee. (First available award in the 2018/19 winter session.)

**Mosaic Award in Real Estate**

A \$2,500 award is offered annually by Mosaic Homes to an outstanding third or fourth year Bachelor of Commerce student interested in pursuing a career in real estate who demonstrates academic excellence, leadership, and community involvement. Preference is given to a UBC Real Estate Club member. The award is made on the recommendation of the Sauder School of Business. (First award available in the 2018/2019 winter session.)

**PlayCheques Financial Solutions Award in Endodontics**

A \$3,000 award is offered annually by PlayCheques Financial Solutions to a student entering the third year of the M.Sc./Diploma Program in Endodontics who has demonstrated both high overall didactic and clinical performance as well as class leadership. To be considered for this award, a student must be either a Canadian citizen or permanent resident. The awards are made on the recommendation of the Faculty of Dentistry in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)



**PlayCheques Financial Solutions Award in Orthodontics**

A \$3,000 award is offered annually by PlayCheques Financial Solutions to a student entering the third year of the M.Sc./Diploma Program in Orthodontics who has demonstrated both high overall didactic and clinical performance as well as class leadership. To be considered for this award, a student must be either a Canadian citizen or permanent resident. The awards are made on the recommendation of the Faculty of Dentistry in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**PlayCheques Financial Solutions Award in Pediatric Dentistry**

A \$3,000 award is offered annually by PlayCheques Financial Solutions to a student entering the third year of the M.Sc./Diploma Program in Pediatric Dentistry who has demonstrated both high overall didactic and clinical performance as well as class leadership. To be considered for this award, a student must be either a Canadian citizen or permanent resident. The awards are made on the recommendation of the Faculty of Dentistry in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**PlayCheques Financial Solutions Award in Periodontics**

A \$3,000 award is offered annually by PlayCheques Financial Solutions to a student entering the third year of the M.Sc./Diploma Program in Periodontics who has demonstrated both high overall didactic and clinical performance as well as class leadership. To be considered for this award, a student must be either a Canadian citizen or permanent resident. The awards are made on the recommendation of the Faculty of Dentistry in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**PlayCheques Financial Solutions Award in Prosthodontics**

A \$3,000 award is offered annually by PlayCheques Financial Solutions to a student entering the third year of the M.Sc./Diploma Program in Prosthodontics who has demonstrated both high overall didactic and clinical performance as well as class leadership. To be considered for this award, a student must be either a Canadian citizen or permanent resident. The awards are made on the recommendation of the Faculty of Dentistry in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**Dr. Lance Rucker Award in Dentistry**

A \$1,000 award is offered annually to a second year D.M.D student who demonstrates excellence in attaining operator balance and patient positioning and therefore optimizing dental clinical ergonomics during the transition to clinical care of patients. This award is in recognition of Dr. Rucker's 35-year academic career as a full-time faculty member at the university, including his pioneering work in the development of custom declination in surgical telescopes and his longstanding commitment to advancing educational equipment and teaching methodologies which improve the ergonomics of dental practice. The award is made on the recommendation of the Faculty of Dentistry. (First award available in the 2018/19 winter session.)



### Art Soregaroli Memorial Award

A \$1,000 award is offered annually by family, friends and former students in memory of Dr. Art Soregaroli to a top-performing undergraduate student in Earth, Ocean and Atmospheric Sciences, with preference to a student enrolled in a 3rd or 4<sup>th</sup>-year mineral-deposit geology course. Art was a UBC alumnus and professor of Economic Geology. He would later go on to join the Geological Survey of Canada in the early 1970's, serve as the Vice President at Westmin Resources, and end his career as the chief geoscientist for Teck Corporation. Art's love of mineral collecting and travel took him and wife Rosalie to many exotic destinations in the years that followed. The award is made on the recommendation of the Department of Earth, Ocean and Atmospheric Sciences (First award made available in the 2018/19 winter session.)

### PREVIOUSLY APPROVED AWARDS WITH CHANGES IN TERMS OR FUNDING SOURCE

#### 5141 – Go Global International Community Field Experience Award

##### Proposed Award Description

Awards valued up to \$1,000 each are offered to domestic and **international** UBC Teacher Education students participating in recognized student activities through international practicum placements arranged by Go Global. The awards are made on the recommendation of the Go Global International Learning Programs in consultation with Enrolment Services.

*Rationale for Proposed Changes: As requested by Enrolment Services, this award is being revised to make it available to international students.*

#### 8646 – Dabrowski & Shepherd Environmental Engineering Bursary

##### Proposed Name: Dabrowski & Shepherd **Award in Environmental Engineering Bursary**

##### Proposed Award Description

~~Bursaries~~ Awards totalling \$10,000 are offered annually by Barbara Dabrowski (B.A.Sc. 1978, M.A.Sc. 1981) and Robert Shepherd (B.A.Sc. 1969, M.Eng. 1979) to support graduate students studying Environmental Engineering, ~~with a specialization in Pollution Control and Waste Management.~~ **Students will be selected based on their progression in their program and also their research productivity. Financial need may be considered.** Barbara and Robert met at UBC and both dedicated their careers to Environmental Engineering. ~~The bursaries are adjudicated by Enrolment Services.~~ **These awards are adjudicated by the Department of Civil Engineering in consultation with the Department of Chemical and Biological Engineering and the Faculty of Graduate and Postdoctoral Studies.**

*Rationale for Proposed Changes: At the request of the donors, this bursary is being revised to an award and removing the criterion of specialization in Pollution Control and Waste Management to increase the candidate pool as the current pool was too small to fully assign the bursaries during the 2017-18 winter session. The donors plan to*



*eventually endow this gift so we would like to ensure that the award is fully spent each year.*

### **6378 – Brahm Wiesman Memorial Scholarship in Community and Regional Planning**

#### **Proposed Award Description**

A Scholarships totalling \$16,300 scholarship has have been endowed made available through an endowment created by Mrs. Madge Wiesman, and augmented by colleagues and friends, in memory of her husband, Professor Brahm Wiesman, who. Professor Wiesman was the Director of UBC's School of Community and Regional Planning (SCARP) for many years. The award is scholarships are offered to students in the School of Community and Regional Planning for travel abroad to carry out Asia and Global South countries elsewhere in order to advance their SCARP-related research under the auspices of a university exchange program, with preference to students travelling to China or Southeast Asia. The award is scholarships are made on the recommendation of the School of Community and Regional Planning in consultation with the Faculty of Graduate and Postdoctoral Studies.

*Rationale for Proposed Changes: At the request of the donor and SCARP, this award is being revised to allow for multiple scholarship as the principal has grown due to recent large donations to the endowment. The travel criteria has been expanded to include Indigenous communities and the Global South.*

### **5683 – Medicine Class of 1979 Entrance Scholarship in Public Health**

#### **Proposed Award Description**

Scholarships of \$1,000 are offered annually to M.D. students taking a break from their medical studies to pursue a Masters in Public Health within the School of Population and Public Health first-year Masters of Public Health students who are recent graduates of the UBC Faculty of Medicine M.D. program or are on leave from the program or are pursuing a joint M.D./M.P.H degree and demonstrate high academic achievement or potential upon entering the M.P.H program. The scholarships are made on the recommendation of the School of Population and Public Health, in consultation with the Faculty of Graduate and Postdoctoral Studies, to students or graduates with high academic standing achievement or potential entering the MPH program.

*Rationale for Proposed Changes: At the request of the award donor and Development colleagues in the Faculty of Medicine, the award criteria is being broadened to include recent M.D. graduates due to the difficulty in assigning the award currently. This award has been unassigned since winter 2013. There is a lack of M.D. students who take a break from studies to persue a Masters degree in public health and the joint M.D./M.P.H degree referenced in the original description has never existed at UBC.*

### **1814 – Rashida Ali Award in Dentistry**

#### **Proposed Award Description**



A \$1,000 award is offered by Dr. Asef Karim (B.Sc. 1993, D.M.D. 1999) in honour of his aunt, Ms. Rashida Ali, to a **graduating student in the combined MSc in Craniofacial Science and Diploma in Orthodontics program** who demonstrates leadership skills and excellence in the **Professionalism and Community Service Program (PACS)** and professionalism in the Faculty of Dentistry. The award is made on the recommendation of the Faculty **of Dentistry** in consultation with the Faculty of Graduate and Postdoctoral Studies.

*Rationale for Proposed Changes: This award description is being revised at the request of the award donor and in collaboration with Development colleagues in the Faculty of Dentistry to more closely align with the donor's current area of dental practice.*

### **3269 – Dr. Lore Dolman Memorial Prize**

#### **Proposed Award Description**

A \$450 prize has been endowed in memory of Dr. Clarisse L. Dolman who was Head of the Division of Neuropathology at Vancouver General Hospital from 1954 to 1988 and, as a UBC clinical professor, taught many residents and medical students. The **award prize is made awarded to an M.D. student at the end of second year who demonstrates excellence in the overall field in pathology** on the recommendation of the Department of Pathology and Laboratory Medicine ~~to a meritorious medical student in FMED 425.~~

*Rationale for Proposed Changes: Due to changes in curriculum, the specific course referenced in the adjudication criteria, FMED 425, no longer exists. At the request of the Faculty of Medicine and in consultation with the Office of University Counsel, the criteria for student selection for this endowment has been revised to refer to the area of study rather than a specific course number.*

### **3702 – BC Pharmacy Association Scholarship**

#### **Proposed Award Description**

Two scholarships of \$1,550 each have been ~~endowed~~ **made available through an endowment established** by the British Columbia Pharmacy Association for students in the Faculty of Pharmaceutical Sciences who ~~are proceeding to the final year. The awards are made on the recommendation of the Faculty to students who, in their opinion,~~ show a major interest in and promise of combining a successful career in the practice of community pharmacy with active participation in community and professional affairs. **Preference to a 4th year student and that one scholarship go to a student from rural BC.** Scholarship recipients are offered memberships in the **BC Pharmacy Association.** **The scholarships are made on the recommendation of the Faculty of Pharmaceutical Sciences.**

*Rationale for Proposed Changes: The Lower Mainland is a saturated market for pharmacy practices while rural BC areas do not have sufficient pharmacists. This revision is to encourage students from rural BC communities to become pharmacists and hope that they return to their communities to practice. While there is no guarantee that a*



*student will return to their rural community, it may make them and others more aware of the opportunities and importance of practicing in the rural areas. Rural BC is defined by the Office of Experiential Education, Faculty of Pharmaceutical Sciences as being anywhere in BC outside the Lower Mainland.*

#### **4346 – Dr. Peter Gee-Pan Mar Memorial Scholarship**

##### **Proposed Award Description**

A \$2,250 scholarship has been made available through an endowed endowment established by family and friends in memory of Peter and his wife, Kathryn Liang Chi-Fang Mar. The award is made on the recommendation of the Department of Biochemistry, to a student entering fourth-year Science and proceeding towards the degree of B.Sc. (Honours) in Biochemistry. Preference is given to candidates born in Canada, of Chinese ancestry. The scholarship is made on the recommendation of Enrolment Services in consultation with the Department of Biochemistry and Molecular Biology.

*Rationale for Proposed Changes: The Dr. Peter Gee-Pan Mar Memorial Scholarship was created in 1987 with a gift from the family of the late Dr. Peter Gee-Pan Mar to establish an award for students born in Canada of Chinese ancestry. In October 2017, Associate Dean Paul Harrison expressed concern that it was difficult for the Department of Biochemistry and Molecular Biology to determine a student's ancestry. University Counsel reviewed the underlying documentation of the endowment and advised that we are not in a position to change the preference provisions dealing with place of birth and ancestry.*

*Based on this, we are requesting that the adjudication process for this award be amended to an affiliated model which would remove the responsibility of determining ancestry from the Department. The affiliated model is overseen by Enrolment Services and allows students to self-identify as belonging to a certain group, in this case being born in Canada and of Chinese ancestry. Once the subgroup of students who belong to this category is compiled by Enrolment Services, the list would be forwarded to the Department of Biochemistry and Molecular Biology so that they could select the award recipient. If no students self-identify as belonging to said group, the preference criteria would not be applied and the recipient would be selected from the larger student body. The amendment to the affiliated adjudication process would allow for the spirit of the award to continue to be honoured while removing the Department from assessing sensitive criteria.*

*Awards that are available to only certain groups of students are not considered to be in contravention of the Human Rights Code (or public policy) if there are bona fide and reasonable justifications for the award. Therefore, student awards specifically for groups which have historically suffered from discrimination are permissible under the Code (and public policy) (Senate Awards Committee, 2018). Given this context and the history of Chinese Canadians being subjected to systematic and legislated discrimination designed*



*to deny basic human rights by prior provincial governments in British Columbia (Government of British Columbia), one could make an argument that this award is ameliorating past injustices. Though it is unclear whether the university would likely enter into a similar endowment agreement in present day giving preference to students born in Canada of Chinese ancestry, this award was established 31 years ago and the history of discrimination would have been more recent. In 1987, laws which discriminated against Chinese British Columbians had only been repealed 35 years previously. For instance, the City of Vancouver granted municipal voting rights to the Chinese in 1949; Chinese were barred from civic employment until 1952; and Vancouver's only public swimming pool, the Crystal Pool, was segregated with Chinese being allowed to swim one day a week until 1945 (City of Vancouver Administrative Report, 2017).*





## Appendix B: Curriculum Report

### FACULTY OF APPLIED SCIENCE

#### *New courses*

**CHBE 488 (3)** Carbon Capture, Conversion and Sequestration Technologies;  
**NURS 180 (3)** Stress and Strategies to Promote Well Being;  
**NURS 280 (3)** Human Sexual Health;  
**NURS 290 (3)** Health Impacts of Climate Change.

### FACULTY OF ARTS

#### *New courses*

**ARTH 230 (3)** Art & Feminism(s): Histories, Lineages, Legacies;  
**ARTH 383 (3)** Queer Partnerships in Art & Art-Making;  
**ENGL 381 (3-6)** d Theory: Signs, Codes, and Representation;  
**ENGL 384 (3-6)** d Theory: Space and Displacement;  
**ENGL 386 (3-6)** d Theory: Critique, Intervention and Dissent;  
**ENGL 387 (3-6)** d Theory: Bodies;  
**ENGL 388 (3-6)** d Theory: Feminisms;  
**PHIL 348 (3)** Introduction to Continental Philosophy.

### FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

#### **Applied Science**

##### *New courses and removal of program*

**CHBE 588 (3)** Carbon Capture, Conversion and Sequestration Technologies;  
**CPEN 524 (3)** Principles of Mobile Application Development and Analysis;  
**EECE 500 (3)** Introduction to the Academic Enterprise;  
**EECE 502 (3/6)** Cybersecurity Research Seminar;  
**ELEC 503 (3)** Integrated Circuits for High-Speed Data Links,  
**ELEC 504 (3)** Radio Frequency Integrated Circuits;  
**ELEC 505 (3)** Integrated Circuits for Phase-Locked Loops;  
**ELEC 506 (3)** CMOS Design for Photonics;  
 Removal of **Master of Software Systems**.

#### **Arts**

##### *New course*

**GRSJ 515 (3/6)** d Critical and Creative Social Justice Studies Seminars.

#### **Forestry**

##### *New Dual Degree Program*

**Transform-M (Transatlantic Forestry Master)**

### FACULTY OF SCIENCE

#### *New courses and new minor*

**CHEM 100 (3)** Foundations of Chemistry;  
**CPSC 107 (3)** Systematic Program Design;  
**CPSC 491 (6)** Interactive Digital Media Practicum;  
**DSCI 100 (3)** Introduction to Data Science;  
**ISCI 312 (3)** Symmetry;  
**MATH 404 (3)** Harmonic Analysis I;  
**MATH 423 (3)** Commutative Algebra;



**PHYS 100 (3)** Introductory Physics;  
**Sustainable Food Systems Minor.**





8 September 2017

To: Vancouver Senate

From: Tributes Committee

Subject: Memorial Minutes

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The Tributes Committee has prepared memorial minutes for the following individual:

*Mr. William Watson*

***Motion:*** *That Senate approve the Memorial Minute for Mr. William Watson, that it be entered into the Minutes of Senate, and that copies be sent to the family of the deceased.*

Respectfully submitted,

Dr. Sally Thorne, Chair  
Senate Tributes Committee



### **Mr. William J. Watson**

Assistant University Librarian Emeritus William J. Watson was born in Walkerville, Ontario in 1928, and was raised in Ottawa. He studied journalism at Carleton College, and later completed degrees in Islamic Studies and Librarianship at McGill University.

After completing his studies at McGill, Mr. Watson served as librarian at McGill's Institute for Islamic Studies, and as an Assistant Professor of Library Science. He remained at McGill for 10 years before joining the UBC Library as an assistant librarian in the mid-1960s. In 1969, he left UBC to become the second University Librarian at the University of Waterloo, a post he held for three years before returning to the West Coast and re-joining the UBC Library in 1972.

Mr. Watson remained at UBC until his retirement, twice serving as acting University Librarian where he served on Senate from September 1989- June 1990. In addition to his duties at McGill, Waterloo, and UBC, Mr. Watson served as a member of the council of the Bibliographical Society of Canada, and as chair of a national committee on automation in Canadian university libraries foreseeing the current era of automation as early as 1969.

To his family and friends, the Senate and the University of British Columbia offer their condolences and thanks.



19 September 2018

To: Senate

From: Senate Awards Committee

RE: Policy V-200.2: *Student Awards*

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Over the course of the 2017-18 academic year and summer 2018, the Senate Awards Committee engaged in a review of Senate Policy V-200: *Student Awards*. Through this review and the associated campus-wide consultation process, the Committee has completed a comprehensive revision of the policy.

The most significant change to the policy is a reduction in the total credit-load required for awards eligibility from 27 to 24 credits. In order to ensure that students could benefit from this change in the current academic year, this change was approved by Senate at its May 2018 meeting, and is currently in effect.

The changes reflected in the current proposal are less substantial, and primarily include editorial changes and codification of existing practices not reflected in the current policy. These include:

1. Updating of language pertaining to adherence to human rights legislation, drafted in consultation with the Office of University Counsel (paragraph 3)
2. Delineation of process for updating and revising student awards, drafted in consultation with the Office of University Counsel (paragraph 6)
3. Clarification and codification of practices relating to recording student awards on student transcripts (paragraph 7)
4. Codification of practice of permitting students registered with Access & Diversity to maintain eligibility for awards if enrolled in an approved, reduced course load (paragraph 15)
5. Creation of mechanism by which first-year students who fail to meet award renewal criteria may be permitted to retain a renewable award (paragraph 17)
6. Creation of mechanism by which eligibility for awards may be limited for students who are eligible to graduate, but choose to continue their studies (paragraph 20)



7. Codification of practices relating to student awards, co-op and exchange (paragraphs 21-26)

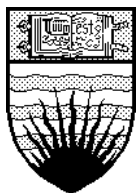
Marked and clean copies of the revised policy are enclosed.

The Committee requests the following:

***Motion:*** *That Senate approve Policy V-200.2: Student Awards, effective 1 September 2019.*

Respectfully submitted,

Dr. Lawrence Burr  
Chair, Senate Awards Committee

**THE UNIVERSITY OF BRITISH COLUMBIA****SENATE POLICY:  
V-#200.2**

**VANCOUVER SENATE**  
c/o Enrolment Services  
2016 - 1874 East Mall  
Vancouver, B.C. Canada V6T 1Z1

**Number & Title**      *V-200.2 – Student Awards*

**Effective Date:**

1 September 2019

**Approval Date:**

19 September 2018

**Review Date:**

This policy shall be reviewed ~~two (2)~~ **five (5)** years after approval and thereafter as deemed necessary by the **Responsible Committee**.

**Responsible Committee:**

Senate Awards Committee

**Authority:**

*University Act, S. 37(1)*

*“The academic governance of the university is vested in the senate and it has the following powers:*

*...(i) to recommend to the board the establishment or discontinuance of any faculty, department, course of instruction, chair, fellowship, scholarship, exhibition, bursary or prize;*

*(j) to award fellowships, scholarships, exhibitions, bursaries and prizes;...*

## Purpose and Goals:

This policy is designed to guide the ~~development~~ **approval, revision, and administration** of **Student Awards** to assist the University in its goals ~~to attract~~ **of attracting** the most academically qualified students, ~~and~~ **rewarding** their successes, **supporting students in financial need, and** ~~at the University. With that objective in mind, it is the primary policy of the University to encourage~~ **encouraging** donations, whether to individual Faculties or the University's general scholarship and bursary funds, ~~which can be used to reward excellence and/or to provide support to students with financial need.~~

The ~~goal~~ **purpose** of this policy is **to establish and ensure fair, flexible and efficient administrative processes for Student Awards and associated funds** ~~promote the creation of awards that ensure fairness to students in the adjudication of awards, while providing for maximum flexibility and efficiency in the administration of available funds.~~ **awards and associated funds.**

## Applicability:

~~As of the effective date above, t~~ This policy is applicable to any **Student Award** offered by the University **using University funds or established through donations from donors to the University** ~~or by donors through the University~~ that is **established on or after the effective date of this policy. Any amendments to existing Student Awards approved on or after the effective date of this policy must also comply with this policy unless otherwise approved by Senate.**

## Exclusions:

### None

~~Student awards developed and implemented~~ **approved** prior to the effective date of this policy may not necessarily follow the definitions set out below. **are not bound by the provisions of this policy, except as those awards may be amended on or after the effective date of this policy, unless otherwise approved by Senate.**

~~Although defined below and established through a recommendation of the Senate to the Board, financial support programs such as bursaries are governed by the Board of Governor's Policy #72—Access to the University of British Columbia.~~

**This policy does not apply to payments made by the University to any person through payroll, or for the reimbursement of costs or expenses.**

## Definitions:

For the purposes of this policy ~~and in all other policies in which they are not otherwise defined:~~

<b>Academic Merit</b>	shall refer to a student's academic performance as represented by the student's academic average in 24 credits completed in a single session. For students completing more than 24 credits in a single session, the 24 credits used to calculate the academic average will be selected in the manner most advantageous to the student.
<i>Continuing</i>	shall <del>mean</del> refer to a <b>Student Award</b> given <del>on the basis of merit, academic or otherwise, demonstrated by the student in the course of studies at the University.</del> according to criteria met or demonstrated by a student <del>on the basis of a student's performance</del> while enrolled as a student at the University or while completing non-credit programming offered by the University.
<del><i>Entrance</i></del>	<del>shall mean refer to a Student Award given according to criteria including merit met or demonstrated by a the student prior to commencing studies at the University.</del>
<i>Merit-based</i>	shall <del>mean</del> refer to <del>that</del> a <b>Student Award</b> <del>is</del> given based on academic <del>and/or other</del> achievement, such as service, leadership, or research <del>merits and not financial need.</del>
<i>Need-based</i>	shall <del>mean</del> refer to a <b>Student Award</b> <del>financial support</del> given <del>to a student</del> based on <del>assessed</del> financial need <del>and not achievement, academic or other merit.</del> Any student award that is based on financial need <del>t is not indicated on a student transcript.</del>
<b>Renewable</b>	shall refer to a <b>Student Award</b> that provides annual funding over multiple academic sessions, subject to the student meeting renewal criteria.
<del><i>Student Award</i></del>	<del>shall mean any type of financial award or assistance, including bursaries, fellowships, medals, prizes, and scholarships, that is given to students by the University or by donors through the University.</del>
<i>Student Award</i>	shall <del>mean</del> refer to any type of financial award or assistance, <del>including any Bursary, Fellowship, Hybrid Award, Medal, Prize, or Scholarship,</del> that is given to students, <del>or participants in non-credit programming,</del> by the University <del>using University funds or established through donations from donors to the University or by donors through the University.</del>

**Student Award Types:**

- Bursary** shall mean a **Student Award** **that is solely Need-based**, ~~given on the basis of assessed financial need. Any student award that takes financial need into account is never indicated on a student transcript.~~
- Fellowship** shall mean a **Merit-based Student Award** **usually disbursed at the beginning of an academic session** ~~given at the start of the academic year~~ to a graduate student primarily based on academic achievement and/or research ability **and** potential.
- ~~Non-academic~~ **Hybrid Award** shall mean a **Student Award** where neither financial need nor academic achievement is the sole criterion considered. (e.g., a **student award** given on the basis of ~~non-academic~~ **achievement other than academic achievement, merit, such as** including, but not limited to, service, leadership, or research, or a combination of academic and ~~non-academic~~ **other achievement merit**, or a combination of **academic and/or other achievement and financial need merit-based and need-based criteria**). Awards of this type may be identified as “Award” in the award title. **Hybrid Awards** given in part on the basis of **Academic Merit** shall be identified as “Academic Award” in the award description. ~~Non-academic awards are not indicated on the student transcript.~~
- Medal** shall mean a **Merit-based** non-monetary **Student Award**, normally given **to a graduating student near at the conclusion end of the an academic session year** based on **Academic Merit**.
- Prize** shall mean a **Merit-based Student Award** given ~~to a student~~ **at the conclusion of an academic session based on Academic Merit** or other academic achievement such as performance in a particular course, research performance, or publication record ~~performance~~ **during the previous academic session** ~~academics and/or achievement of the academic year that has just ended.~~
- Scholarship** shall mean a **Merit-based Student Award** given ~~to a student~~ **solely** on the basis of **Academic Merit** or **other** academic achievement usually disbursed at the beginning of ~~the an~~ **academic session year**.



**Policy:****Approval of New Awards and Changes to Existing Awards**

1. The University shall not normally approve *Student Awards* of any type other than ~~those~~ the “*Student Award Types*” defined in this policy.
2. The title of any *Student Award* ~~award~~ approved by the University must include the term defined in this policy that corresponds to the defined “*Student Award Type*” to which it belongs, except in the case of Hybrid Awards, which may be titled as “Award”.
3. The University shall not approve any *Student Award* ~~terms~~ that ~~are~~ is inconsistent with applicable human rights legislation or offends public policy. No part of this policy should be interpreted to preclude *Student Awards* that have as their object the amelioration of the conditions of disadvantaged individuals or groups or other *bona fide* and reasonable justification. When approving *Student Awards* established through donations from donors to the University for identifiable individuals or groups, the University shall consider the origin and context of the donor’s gift.
4. In approving *Student Awards*, the University shall consider its stated commitments to equity, inclusion, and diversity.
5. The provisions of this policy are not applicable to the extent they conflict, either generally or in any specific instance, with Board of Governor’s Policy #72 (Access to the University of British Columbia).
6. ~~The Senate reserves the right to change the terms governing a student award, so that they may better meet new conditions, more fully carry out the intentions of the donor, or maintain the usefulness of the benefaction. The rights so reserved shall be exercised by resolution of the Senate duly confirmed by the Board of Governors, provided always that sufficient reasonable notice shall be given in Senate of any proposed change and reasonable efforts shall be made to consult the donor or representative, if known, shall be consulted prior to the approval of the proposed change.~~

The Senate may periodically review the terms of a *Student Award* so that it may better meet new conditions, more fully carry out the spirit of a gift from a donor or maintain the usefulness of the *Student Award*. Where the Senate wishes to change the terms of a *Student Award*, the Senate will consult with the Office of the

University Counsel to determine the necessary process and approvals required to implement that change.

The process and approvals will depend on factors such as:

- (a) Whether the *Student Award* is funded by the University or a donor;
- (b) If by a donor, whether funding is annual or endowed;
- (c) If endowed, whether the change is within the scope of the purposes of the endowment or whether the purposes of the endowment would require variation; and
- (d) If variation is required, whether the variation of the purposes of the endowment may be approved by the Board of Governors or requires court approval.

Where variation to the endowment purpose must be approved by the Board of Governors, the variation to the endowment purpose must be approved by the Board of Governors before changes to the terms of the *Student Award* are approved by Senate.

#### General

7. The recording of *Student Awards* on a student's official transcript of academic record shall be determined as follows:

- a. *Hybrid Awards* given in part on the basis of *Academic Merit*, *Fellowships*, *Medals*, *Prizes*, *Scholarships* and any other *Student Awards* given solely or partially based on *Academic Merit* or other academic achievement, shall be listed on the transcript of academic record unless otherwise approved by Senate.
- b. *Hybrid Awards* given based on criteria that do not include *Academic Merit* or other academic achievement shall not be listed on the transcript of academic record unless otherwise approved by Senate.
- c. *Bursaries* and any other *Student Awards* that are solely *Need-based*, shall not be listed on the transcript of academic record.

8. *Student Awards* issued by the University are normally first applied to any tuition and other student fees owing. If the amount of the *Student*

*Award* is greater than **any tuition or other student fees owing**, the excess amount is paid to the student.

9. **The University does not guarantee the payment of any Student Awards other than those funded by the University.** In any given year, if invested funds do not provide sufficient income to disburse any endowed *Student Award*, payment of the *Student Award* may be reduced or withheld. ~~The University does not guarantee the payment of any student awards other than those funded by the University.~~ The University reserves the right to withhold *Student Awards* **established through donations from donors to the University** ~~donated by individuals or organizations~~ where the required funds have not yet been received by the University.
10. A recipient of a *Student Award*, **other than a Bursary**, may **accept** ~~retain~~ the honour of an *Student Award* but **decline** ~~resign~~ the monetary value. **Any funds so declined will be made available** ~~Any funds thus made available will be made available~~ to another eligible student.
11. ~~Scholarships and~~ *Student Awards*, **other than Prizes, Medals or other Student Awards intended for graduating students**, awarded for academic achievement in a specific Faculty or discipline or intended for students studying in a particular program are normally conditional upon the recipient **maintaining registration** ~~continuing studies~~ in the same discipline or program during the **funding period** ~~following year~~. A program change to an ineligible Faculty or **program** ~~discipline~~ will **usually** ~~normally~~ result in reassignment of **any unpaid funds associated with** the award to another eligible student.

### Undergraduate Awards

12. Unless otherwise stated **in the award description**, undergraduate *Student Awards* **may be received only by students enrolled at the University during the Winter Session, as defined in the Academic Calendar.** ~~are tenable only at UBC (Vancouver or Okanagan Campus) and are open to Winter Session students only. Marks obtained in Summer Session courses are not taken into account in the adjudication of student awards.~~
13. Marks obtained in **courses undertaken during** Summer Session, **as defined in the Academic Calendar**, ~~courses~~ are not **considered** ~~taken into account~~ in the adjudication of *Student Awards*.

~~Entrance Student Awards and Scholarships other than Bursaries are adjudicated based on a student's academic and other achievement experience achieved prior to attending UBC. These awards are made on a competitive basis and their purpose is to attract highly qualified students.~~

14. **Subject to Paragraph 11, Continuing** ~~scholarships, prizes, or other~~ undergraduate, **Scholarships, and Hybrid Awards given in part on the basis of Academic Merit** ~~student awards based on academic merit and~~ will normally be given to a student who ~~is~~

- i. ~~is~~ registered in at least 24 percentage-graded credits ~~in the current session or, for students enrolled in programs customarily requiring credits that are not percentage-graded, is registered in at least 24 total credits in the current session, with the required number of percentage-graded credits determined by the Faculty;~~ and,
- ii. has standing in the top 10% of his/her year and Faculty or an average of 75% or higher (with no failed courses) in the academic session on which the **Student Award** ~~award~~ adjudication is based. Academic standing for students taking more than 24 credits will be determined on the basis of 24 percentage-graded credits to be chosen in the manner that is most advantageous to the student.

15. Paragraph 14 notwithstanding, students registered with Access & Diversity and taking an approved reduced credit load may remain eligible for **Scholarships and Hybrid Awards granted on the basis of Academic Merit** if registered in fewer than 24 credits.

~~Academic standing for students taking more than 27 24 credits will be determined on the basis of 27 24 percentage-graded credits to be chosen in the manner that is most advantageous to the student.~~

16. Recipients of undergraduate **Continuing and Renewable Scholarships, Hybrid Awards and other Student Awards given in whole or in part on the basis of Academic Merit** ~~scholarships, prizes and other merit-based student awards based on academics~~ are normally expected to be registered in 24 credits in order to retain their **Scholarship or Hybrid Award**. **Scholarships and Hybrid Awards given on the basis of Academic Merit** are offered only to those who continue their studies to the satisfaction of the Registrar. Students registered in fewer than 24 credits in their final year of study may retain a **Scholarship or Hybrid**

**Award given in part on the basis of Academic Merit** and/or be eligible for a **Prize or Medal** if their Faculty or School confirms that the number of credits in which the student is registered is sufficient for graduation. In this case, ~~a~~ **the monetary value of the Student Award scholarship** may be **reduced.** ~~prorated.~~

17. **Recipients of undergraduate Continuing and Renewable Scholarships, Hybrid Awards given in part on the basis of Academic Merit and other Student Awards given on the basis of academic achievement who fail to meet renewal requirements in their first year of study may be permitted to retain their Student Award at the discretion of the Registrar or the academic or administrative unit responsible for administering the Student Award. Students permitted to retain their Student Award after failing to meet renewal requirements in their first year of study will normally not be permitted to retain their Student Award in future years should they again fail to meet renewal requirements.**
18. Students who have completed at least one year of study at **the University UBC** may be eligible to defer ~~certain~~ **Scholarships, Hybrid Awards, or other Merit-based Student Awards** for **up to** one year, provided they show satisfactory reasons for postponing attendance. Requests for deferment must be made to Enrolment Services. Students wishing to take up a **deferred Student Award** ~~deferred from a previous year~~ must advise Enrolment Services **in writing** before ~~July 1~~ **the first day of the Winter Session, as defined in the Academic Calendar, in which they intend to take up the Student Award, or such other date identified to the student at the time of or prior to the deferral of the Student Award.**
19. ~~The University recognizes that students may encounter opportunities or circumstances that could result in a request for deferred admission. Applicants intending to commence the first year of a degree program may request a deferral for one year (or two years in cases of mandatory military service).~~ Students who have been granted deferred admission will automatically have any **Scholarships, Hybrid Awards or other Merit-based Student Awards** ~~scholarships or other merit-based or non-academic awards~~ deferred until they begin their study at the University **unless the student is otherwise notified at the time**

**the *Student Award* is offered or at the time the deferral of admission is granted.**

In order to receive a **deferred *Student Award***, students who are granted permission to defer their admission and therefore their ***Student Award***, will **still** have to satisfy any conditions of **admission imposed at the time of admission**, ~~the Admissions office, such as completion of courses in progress, maintenance of a satisfactory admission average, and graduation from secondary school.~~ They must apply to take up the deferred offer by the application deadline of the following year, **and** ~~They~~ must register in the program and at the campus to which they were admitted ~~or will be required to reapply and compete with the new applicant pool for a space.~~

**20. Once a student has completed all requirements to graduate from the degree program in which the student is enrolled and is not otherwise ineligible to graduate, the student's eligibility for future *Student Awards* may be limited at the discretion of the Registrar, or in the case of a specific *Student Award*, the academic or administrative unit responsible for administering the *Student Award*.**

#### Co-operative Education Programs

**21. Students enrolled in co-operative education programs will be eligible to receive payments for *Student Awards* specifically intended for students enrolled in co-operative education programs during any academic session in which they are enrolled in a co-operative education program.**

**22. Eligibility to receive payments for *Student Awards* not specifically intended for students enrolled in co-operative education programs which would normally be payable during the winter session in which the student is enrolled in a co-operative education program will be determined as follows:**

- a. Students enrolled in co-operative education programs during both terms of the winter session, will have *Student Award* payments deferred until the next winter session;**

- b. Students enrolled in co-operative education programs during only one of the two terms of the winter session, will be eligible to receive no more than 50% of any *Student Award* payments provided the student is registered in 12 or more credits during the term in which the student is not enrolled in a cooperative education program.

23. Payments for *Student Awards* that would normally be deferred under this policy to a future academic session, may be made in extenuating circumstances to students enrolled in co-operative education programs at the discretion of the Registrar or the academic or administrative unit responsible for administering the *Student Award*.

24. Eligibility for *Student Awards* in the winter session following the winter session in which a student was enrolled in a co-operative education program will be determined as follows:

- a. Students will not be eligible for *Scholarships* or *Hybrid Awards* granted on the basis of *Academic Merit* in the winter session following a winter session in which the student was enrolled in a co-operative education program during both terms.
- b. Students will be eligible for *Scholarships* or *Hybrid Awards* granted on the basis of *Academic Merit* in the winter session following a winter session in which the student was enrolled in a co-operative education program during one term, provided the student completed 12 or more credits during the other term. Such students will be eligible to receive no more than 50% of the value of any *Scholarship* or *Hybrid Awards* granted on the basis of *Academic Merit*.
- c. Students will be eligible for *Student Awards* other than *Scholarships* or *Hybrid Awards* granted on the basis of *Academic Merit* in the winter session following a winter session in which the student was enrolled in a co-operative education program during one or both terms.

Exchange

25. Students enrolled in exchange programs will normally be eligible to receive payments for *Student Awards* during any academic session in which they are enrolled in an exchange program;
26. Students will normally be eligible for *Student Awards* in the winter session following the winter session in which the student was enrolled in an exchange program, in accordance with paragraph 14. Grades achieved while on exchange may be translated or adjusted for consistency with the University's standards and practices regarding grading and academic standing.

### Graduate Awards

27. ~~The fellowships and scholarships~~ *Student Awards* offered to graduate students, unless otherwise **approved by Senate**, are available only to support students engaged in full-time study and/or research leading to a degree at the University of British Columbia and will normally be paid only if the recipient is registered as a full-time student at the University during the payment period.
28. ~~Students offered both a major university graduate fellowship funding (Killam Doctoral Fellowship, Four Year Doctoral Fellowship, University Graduate Fellowship, or Affiliated Graduate Fellowship) and external funding for full-time study and research at UBC will be required to accept the external funding. If the value of the external award funding is less than the value of the major university graduate fellowship, the student will receive the difference between the major University graduate fellowship and external award funding.~~

**In cases where students are offered both major University graduate Fellowship or Scholarship funding and external funding for full-time study and research at UBC, the value of the University Fellowship or Scholarship funding will be adjusted as follows: if the value of the external award funding is less than the value of the University Fellowship or Scholarship funding, the student will receive the difference between the major University graduate Fellowship or Scholarship and external award funding. If the value of the external award funding is greater than the value of the University Fellowship or Scholarship funding, the student will normally not receive any University Fellowship or Scholarship funding. In some circumstances, students may remain eligible for**



**the tuition component of their University *Fellowship(s)* or *Scholarship(s)*.**

### **Vantage College**

29. ~~While enrolled in Vantage College, students fall under the student classification “International Program” and are not undergraduate students for the purposes of this policy.~~
- a. ~~Vantage College are adjudicated by Vantage College on a competitive basis from among applicants who come from a variety of cultural and socio-economic backgrounds. Where indicated in the *Student Award* description, financial need may also be taken into account in the adjudication of Vantage College awards.~~
  - b. **Student performance during the entire 11-month Vantage College program may be considered when assessing the eligibility of Vantage College students for *Continuing Student Awards*.** ~~Recipients of annually *renewable* Vantage College student awards become subject to the provisions of this policy governing Undergraduate Awards when they progress into the second or subsequent year of their program of study and achieve regular student status.~~

### **Transition**

30. At any time prior to 1 September 2020, the Registrar may elect to apply any part of the version of this policy approved on 14 May 2014 if necessary to meet operational requirements.

### **Calendar Statement:**

As per the policy above.

### **Consultations**

The following individuals and groups have been consulted during the development of this policy:

#### **Enrolment Services**

Student Support & Advising  
 Student Financial Support  
 Records & Registration  
 Admissions & Recruitment

Office of the Provost & Vice-President Academic  
 Office of the Vice-President, Students

All Vancouver Faculties and Schools and Vantage College  
Alma Mater Society  
Graduate Students Society  
Office of the University Counsel  
Development & Alumni Engagement  
Athletics  
Access & Diversity  
First Nations House of Learning  
Office of the Ombudsperson for Students  
Go Global  
International Student Initiative

**History:**

Regulations governing **S**udent **A**wards have been listed in the Academic Calendar since 1987/88. These regulations have been subject to minor revisions since that time, the most recent being in **May 2014, when the regulations in the Academic Calendar were converted to this form.**

**Related Policies:**

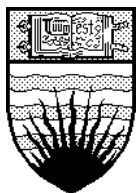
**Board of Governors Policy #72: Access to the University of British Columbia**  
**Senate Policy V-302.2: Graduate Student Leaves of Absence**

**Appendix:**

There is no appendix to this policy.

**Procedures:**

There are no procedures accompanying this policy.

**THE UNIVERSITY OF BRITISH COLUMBIA****SENATE POLICY:  
V-#200.2**

**VANCOUVER SENATE**  
c/o Enrolment Services  
2016 - 1874 East Mall  
Vancouver, B.C. Canada V6T 1Z1

**Number & Title**      *V-200.2 – Student Awards*

**Effective Date:**

1 September 2019

**Approval Date:**

19 September 2018

**Review Date:**

This policy shall be reviewed five (5) years after approval and thereafter as deemed necessary by the *Responsible Committee*.

**Responsible Committee:**

Senate Awards Committee

**Authority:**

*University Act, S. 37(1)*

*“The academic governance of the university is vested in the senate and it has the following powers:*

*...(i) to recommend to the board the establishment or discontinuance of any faculty, department, course of instruction, chair, fellowship, scholarship, exhibition, bursary or prize;*

*(j) to award fellowships, scholarships, exhibitions, bursaries and prizes;...*

**Purpose and Goals:**

This policy is designed to guide the approval, revision, and administration of *Student Awards* to assist the University in its goals of attracting the most academically qualified students, rewarding their successes, supporting students in financial need, and encouraging donations, whether to individual Faculties or the University's general scholarship and bursary funds.

The purpose of this policy is to establish and ensure fair, flexible and efficient administrative processes for *Student Awards* and associated funds.

**Applicability:**

This policy is applicable to any *Student Award* offered by the University using University funds or established through donations from donors to the University that is established on or after the effective date of this policy. Any amendments to existing *Student Awards* approved on or after the effective date of this policy must also comply with this policy unless otherwise approved by Senate.

**Exclusions:**

None

**Definitions:**

For the purposes of this policy:

<i>Academic Merit</i>	shall refer to a student's academic performance as represented by the student's academic average in 24 credits completed in a single session. For students completing more than 24 credits in a single session, the 24 credits used to calculate the academic average will be selected in the manner most advantageous to the student.
<i>Continuing</i>	shall refer to a <i>Student Award</i> given according to criteria met or demonstrated by a student while enrolled as a student at the University or while completing non-credit programming offered by the University.
<i>Merit-based</i>	shall refer to a <i>Student Award</i> given based on academic and/or other achievement, such as service, leadership, or research.
<i>Need-based</i>	shall refer to a <i>Student Award</i> given based on assessed financial need.

*Renewable* shall refer to a *Student Award* that provides annual funding over multiple academic sessions, subject to the student meeting renewal criteria.

*Student Award* shall refer to any type of financial award or assistance, including any *Bursary*, *Fellowship*, *Hybrid Award*, *Medal*, *Prize*, or *Scholarship*, that is given to students, or participants in non-credit programming, by the University using University funds or established through donations from donors to the University.

*Student Award Types:*

*Bursary* shall mean a *Student Award* that is solely *Need-based*.

*Fellowship* shall mean a *Merit-based Student Award* usually disbursed at the beginning of an academic session to a graduate student primarily based on academic achievement and/or research ability and potential.

*Hybrid Award* shall mean a *Student Award* where neither financial need nor academic achievement is the sole criterion considered. (e.g., a *student award* given on the basis of achievement other than academic achievement, including, but not limited to, service, leadership, or research, or a combination of academic and other achievement or a combination of academic and/or other achievement and financial need). Awards of this type may be identified as “Award” in the award title. *Hybrid Awards* given in part on the basis of *Academic Merit* shall be identified as “Academic Award” in the award description.

*Medal* shall mean a *Merit-based non-monetary Student Award*, normally given to a graduating student at the conclusion of an academic session based on *Academic Merit*.

*Prize* shall mean a *Merit-based Student Award* given at the conclusion of an academic session based on *Academic Merit* or other academic achievement such as performance in a particular course, research performance, or publication record during the previous academic session.

*Scholarship* shall mean a *Merit-based Student Award* given solely on the basis of *Academic Merit* or other academic achievement usually disbursed at the beginning of an academic session.

**Policy:**

### Approval of New Awards and Changes to Existing Awards

1. The University shall not normally approve *Student Awards* of any type other than the “*Student Award Types*” defined in this policy.
2. The title of any *Student Award* approved by the University must include the term defined in this policy that corresponds to the defined “*Student Award Type*” to which it belongs, except in the case of Hybrid Awards, which may be titled as “Award”.
3. The University shall not approve any *Student Award* that is inconsistent with applicable human rights legislation or offends public policy. No part of this policy should be interpreted to preclude *Student Awards* that have as their object the amelioration of the conditions of disadvantaged individuals or groups or other *bona fide* and reasonable justification. When approving *Student Awards* established through donations from donors to the University for identifiable individuals or groups, the University shall consider the origin and context of the donor’s gift.
4. In approving *Student Awards*, the University shall consider its stated commitments to equity, inclusion, and diversity.
5. The provisions of this policy are not applicable to the extent they conflict, either generally or in any specific instance, with Board of Governor’s Policy #72 (Access to the University of British Columbia).
6. The Senate may periodically review the terms of a *Student Award* so that it may better meet new conditions, more fully carry out the spirit of a gift from a donor or maintain the usefulness of the *Student Award*. Where the Senate wishes to change the terms of a *Student Award*, the Senate will consult with the Office of the University Counsel to determine the necessary process and approvals required to implement that change.

The process and approvals will depend on factors such as:

- (a) Whether the *Student Award* is funded by the University or a donor;
- (b) If by a donor, whether funding is annual or endowed;
- (c) If endowed, whether the change is within the scope of the purposes of the endowment or whether the purposes of the endowment would require variation; and

- (d) If variation is required, whether the variation of the purposes of the endowment may be approved by the Board of Governors or requires court approval.

Where variation to the endowment purpose must be approved by the Board of Governors, the variation to the endowment purpose must be approved by the Board of Governors before changes to the terms of the *Student Award* are approved by Senate.

## General

7. The recording of *Student Awards* on a student's official transcript of academic record shall be determined as follows:
  - a. *Hybrid Awards* given in part on the basis of *Academic Merit*, *Fellowships*, *Medals*, *Prizes*, *Scholarships* and any other *Student Awards* given solely or partially based on *Academic Merit* or other academic achievement, shall be listed on the transcript of academic record unless otherwise approved by Senate.
  - b. *Hybrid Awards* given based on criteria that do not include *Academic Merit* or other academic achievement shall not be listed on the transcript of academic record unless otherwise approved by Senate.
  - c. *Bursaries* and any other *Student Awards* that are solely *Need-based*, shall not be listed on the transcript of academic record.
8. *Student Awards* issued by the University are normally first applied to any tuition and other student fees owing. If the amount of the *Student Award* is greater than any tuition or other student fees owing, the excess amount is paid to the student.
9. The University does not guarantee the payment of any *Student Awards* other than those funded by the University. In any given year, if invested funds do not provide sufficient income to disburse any endowed *Student Award*, payment of the *Student Award* may be reduced or withheld. The University reserves the right to withhold *Student Awards* established through donations from donors to the University where the required funds have not yet been received by the University.
10. A recipient of a *Student Award*, other than a *Bursary*, may accept the honour of a *Student Award* but decline the monetary value. Any funds so declined will be made available to another eligible student.

11. *Student Awards*, other than *Prizes*, *Medals* or other *Student Awards* intended for graduating students, awarded for academic achievement in a specific Faculty or discipline or intended for students studying in a particular program are normally conditional upon the recipient maintaining registration in the same discipline or program during the funding period. A program change to an ineligible Faculty or program will normally result in reassignment of any unpaid funds associated with the award to another eligible student.

### **Undergraduate Awards**

12. Unless otherwise stated in the award description, undergraduate *Student Awards* may be received only by students enrolled at the University during the Winter Session, as defined in the Academic Calendar.
13. Marks obtained in courses undertaken during Summer Session, as defined in the Academic Calendar, are not considered in the adjudication of *Student Awards*.
14. Subject to Paragraph 11, *Continuing* undergraduate, *Scholarships*, and *Hybrid Awards* given in part on the basis of *Academic Merit* will normally be given to a student who
  - i. is registered in at least 24 percentage-graded credits in the current session or, for students enrolled in programs customarily requiring credits that are not percentage-graded, is registered in at least 24 total credits in the current session, with the required number of percentage-graded credits determined by the Faculty; and,
  - ii. has standing in the top 10% of his/her year and Faculty or an average of 75% or higher (with no failed courses) in the academic session on which the *Student Award* adjudication is based. Academic standing for students taking more than 24 credits will be determined on the basis of 24 percentage-graded credits to be chosen in the manner that is most advantageous to the student.
15. Paragraph 14 notwithstanding, students registered with Access & Diversity and taking an approved reduced credit load may remain eligible for *Scholarships* and *Hybrid Awards* granted on the basis of *Academic Merit* if registered in fewer than 24 credits.



16. Recipients of undergraduate *Continuing and Renewable Scholarships, Hybrid Awards* and other *Student Awards* given in whole or in part on the basis of *Academic Merit* are normally expected to be registered in 24 credits in order to retain their *Scholarship* or *Hybrid Award*. *Scholarships* and *Hybrid Awards* given on the basis of *Academic Merit* are offered only to those who continue their studies to the satisfaction of the Registrar. Students registered in fewer than 24 credits in their final year of study may retain a *Scholarship* or *Hybrid Award* given in part on the basis of *Academic Merit* and/or be eligible for a *Prize* or *Medal* if their Faculty or School confirms that the number of credits in which the student is registered is sufficient for graduation. In this case, the monetary value of the *Student Award* may be reduced.
17. Recipients of undergraduate *Continuing and Renewable Scholarships, Hybrid Awards* given in part on the basis of *Academic Merit* and other *Student Awards* given on the basis of academic achievement who fail to meet renewal requirements in their first year of study may be permitted to retain their *Student Award* at the discretion of the Registrar or the academic or administrative unit responsible for administering the *Student Award*. Students permitted to retain their *Student Award* after failing to meet renewal requirements in their first year of study will normally not be permitted to retain their *Student Award* in future years should they again fail to meet renewal requirements.
18. Students who have completed at least one year of study at the University may be eligible to defer *Scholarships, Hybrid Awards*, or other *Merit-based Student Awards* for up to one year, provided they show satisfactory reasons for postponing attendance. Requests for deferment must be made to Enrolment Services. Students wishing to take up a deferred *Student Award* must advise Enrolment Services in writing before the first day of the Winter Session, as defined in the Academic Calendar, in which they intend to take up the *Student Award*, or such other date identified to the student at the time of or prior to the deferral of the *Student Award*.
19. Students who have been granted deferred admission will automatically have any *Scholarships, Hybrid Awards* or other *Merit-based Student Awards* deferred until they begin their study at the University unless the student is otherwise notified at the time the

*Student Award* is offered or at the time the deferral of admission is granted.

In order to receive a deferred *Student Award*, students who are granted permission to defer their admission and therefore their *Student Award*, will have to satisfy any conditions of admission imposed at the time of admission, must apply to take up the deferred offer by the application deadline of the following year, and must register in the program and at the campus to which they were admitted.

20. Once a student has completed all requirements to graduate from the degree program in which the student is enrolled and is not otherwise ineligible to graduate, the student's eligibility for future *Student Awards* may be limited at the discretion of the Registrar, or in the case of a specific *Student Award*, the academic or administrative unit responsible for administering the *Student Award*.

#### Co-operative Education Programs

21. Students enrolled in co-operative education programs will be eligible to receive payments for *Student Awards* specifically intended for students enrolled in co-operative education programs during any academic session in which they are enrolled in a co-operative education program.
22. Eligibility to receive payments for *Student Awards* not specifically intended for students enrolled in co-operative education programs which would normally be payable during the winter session in which the student is enrolled in a co-operative education program will be determined as follows:
  - a. Students enrolled in co-operative education programs during both terms of the winter session, will have *Student Award* payments deferred until the next winter session;
  - b. Students enrolled in co-operative education programs during only one of the two terms of the winter session, will be eligible to receive no more than 50% of any *Student Award* payments provided the student is registered in 12 or more credits during

the term in which the student is not enrolled in a cooperative education program.

23. Payments for *Student Awards* that would normally be deferred under this policy to a future academic session, may be made in extenuating circumstances to students enrolled in co-operative education programs at the discretion of the Registrar or the academic or administrative unit responsible for administering the *Student Award*.
24. Eligibility for *Student Awards* in the winter session following the winter session in which a student was enrolled in a co-operative education program will be determined as follows:
  - a. Students will not be eligible for *Scholarships* or *Hybrid Awards* granted on the basis of *Academic Merit* in the winter session following a winter session in which the student was enrolled in a co-operative education program during both terms.
  - b. Students will be eligible for *Scholarships* or *Hybrid Awards* granted on the basis of *Academic Merit* in the winter session following a winter session in which the student was enrolled in a co-operative education program during one term, provided the student completed 12 or more credits during the other term. Such students will be eligible to receive no more than 50% of the value of any *Scholarship* or *Hybrid Awards* granted on the basis of *Academic Merit*.
  - c. Students will be eligible for *Student Awards* other than *Scholarships* or *Hybrid Awards* granted on the basis of *Academic Merit* in the winter session following a winter session in which the student was enrolled in a co-operative education program during one or both terms.

#### Exchange

25. Students enrolled in exchange programs will normally be eligible to receive payments for *Student Awards* during any academic session in which they are enrolled in an exchange program;

26. Students will normally be eligible for *Student Awards* in the winter session following the winter session in which the student was enrolled in an exchange program, in accordance with paragraph 14. Grades achieved while on exchange may be translated or adjusted for consistency with the University's standards and practices regarding grading and academic standing.

### **Graduate Awards**

27. *Student Awards* offered to graduate students, unless otherwise approved by Senate, are available only to support students engaged in full-time study and/or research leading to a degree at the University and will normally be paid only if the recipient is registered as a full-time student at the University during the payment period.
28. In cases where students are offered both major University graduate *Fellowship* or *Scholarship* funding and external funding for full-time study and research at UBC, the value of the University *Fellowship* or *Scholarship* funding will be adjusted as follows: if the value of the external award funding is less than the value of the University *Fellowship* or *Scholarship* funding, the student will receive the difference between the major University graduate *Fellowship* or *Scholarship* and external award funding. If the value of the external award funding is greater than the value of the University *Fellowship* or *Scholarship* funding, the student will normally not receive any University *Fellowship* or *Scholarship* funding. In some circumstances, students may remain eligible for the tuition component of their University *Fellowship(s)* or *Scholarship(s)*.

### **Vantage College**

29. Student performance during the entire 11-month Vantage College program may be considered when assessing the eligibility of Vantage College students for *Continuing Student Awards*

### **Transition**

30. At any time prior to 1 September 2020, the Registrar may elect to apply any part of the version of this policy approved on 14 May 2014 if necessary to meet operational requirements.

### **Calendar Statement:**

As per the policy above.

## Consultations

The following individuals and groups have been consulted during the development of this policy:

### Enrolment Services

- Student Support & Advising
- Student Financial Support
- Records & Registration
- Admissions & Recruitment

Office of the Provost & Vice-President Academic

Office of the Vice-President, Students

All Vancouver Faculties and Schools and Vantage College

Alma Mater Society

Graduate Students Society

Office of the University Counsel

Development & Alumni Engagement

Athletics

Access & Diversity

First Nations House of Learning

Office of the Ombudsperson for Students

Go Global

International Student Initiative

## History:

Regulations governing *Student Awards* have been listed in the Academic Calendar since 1987/88. These regulations have been subject to minor revisions since that time, the most recent being in May 2014, when the regulations in the Academic Calendar were converted to this form.

Related Policies:

**[Board of Governors Policy #72: Access to the University of British Columbia](#)**  
**[Senate Policy V-302.2: Graduate Student Leaves of Absence](#)**

## Appendix:

There is no appendix to this policy.

## Procedures:

There are no procedures accompanying this policy.

September 2018

From: Senate Awards Committee

To: Senate

Re: New Awards and Changes to Existing Awards

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## **NEW AWARDS – ENDOWED**

### **Fok Ying Tung Memorial Bursary**

Bursaries totalling \$2,000 have been made available through an endowment established by Benjamin Fok in memory of his late father Dr. Henry Ying Tung Fok, along with matching funds from The University of British Columbia, for undergraduate students in the Faculty of Science with preference to those in honours or major programs in Mathematics or Environmental Sciences. Benjamin Fok (B.Sc. 1971, M.B.A. 1973) is an active UBC alumnus and donor. Dr. Henry Ying Tung Fok was a distinguished international businessman and philanthropist. In addition to founding the Fok Ying Tung Group, the Fok Ying Tung Foundation Ltd. and the Hong Kong Pei Hua Education Foundation, Dr. Fok supported development in China, particularly in education, healthcare, sports, science and culture, and actively supported China-Canada educational exchanges. The bursaries are adjudicated by Enrolment Service. (First award available in the 2018/2019 winter session.)

### **Michael and Mary Gerry Undergraduate Scholarship in Physical Chemistry**

A \$1,200 scholarship has been made available through an endowment established by the late Dr. Michael Gerry and Mrs. Mary Gerry. The scholarship is for an undergraduate student entering 4th year who has demonstrated academic excellence in Physical Chemistry. Preference will be given to a student who is enrolled in courses in the area of molecular spectroscopy. Candidates must be Canadian citizens to be considered. The scholarship is made on the recommendation of the Department of Chemistry. (First award available in the 2018/19 winter session.)

### **Brian Higgins Memorial Award**

A \$1,200 award has been made available through an endowment that commemorates Brian Higgins, a Supervising Lawyer for the Law Students' Legal Advice Program (LSLAP) from 1988 to 2011. The award is for a J.D. student who is a member of LSLAP who has shown dedication to the cause of access to justice and who has volunteered substantial time and effort in delivering pro bono legal services to those who would otherwise have none. This award is made on the recommendation of the Peter A. Allard School of Law. (First award available in the 2018/2019 winter session.)

**Frances Hodgkinson Scholarship in Nursing**

Scholarships totalling \$4,950 have been made available through an endowment established by an estate gift from Frances Hodgkinson (1931-2017) for undergraduate and graduate students enrolled in the School of Nursing. Ms. Hodgkinson (B.S.N. 1980) spent her nursing career working in public health on the North Shore of Vancouver. The scholarships are made on the recommendation of the School of Nursing, and in the case of a graduate student, in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/2019 winter session.)

**Oldrich Hungr Memorial Award**

Awards totalling \$1,400 have been made available through an endowment established by family, friends and colleagues in memory of Dr. Oldrich Hungr for an undergraduate geological engineering student in the Department of Earth, Ocean and Atmospheric Sciences. Preference is given to those with an interest in geohazards, and with demonstrated involvement in a student group or UBC community. Dr. Hungr was born in Prague, Czech Republic and spent his youth pursuing his love of the outdoors. He immigrated to Canada in 1969, where he completed his MSc and PhD in Civil Engineering. In 1996, Dr. Hungr joined the Earth and Ocean Sciences department at UBC, where he inspired countless undergraduate students and mentored over 40 graduate students until his retirement in 2016. The awards are made on the recommendation of the Department of Earth, Ocean and Atmospheric Sciences. (First award available in the 2018/2019 winter session.)

**Dr. K. Leighton Pharmacology and Therapeutics Graduate Award**

Awards totalling \$1,200 have been made available through an endowment established by professors emeriti from the Department of Anesthesiology, Pharmacology and Therapeutics in the Faculty of Medicine. These awards are for graduate students in the Department of Anesthesiology, Pharmacology, and Therapeutics studying pharmacology and therapeutics. The awards are made on the recommendation of the Department of Anesthesiology, Pharmacology and Therapeutics in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**Andy and Bessie Logan Bursary**

Bursaries totalling \$10,000 have been made available through an endowment established by an estate gift from Mr. V. Logan (1937-2017) for undergraduate students pursuing a 4-year degree who have graduated from a high school located in Campbell River or north of Campbell River on Vancouver Island. Preference will be given to students enrolled in the Sauder School of Business. Mr. Logan was a self-employed businessperson who studied at what was then the Faculty of Commerce at UBC from 1955-1960. He resided and worked in the Campbell River

area. The bursaries are adjudicated by Enrolment Services. (First award available in the 2018/2019 winter session.)

**Professor Manzalaoui Memorial Prize**

Prizes totaling \$3,300 have been made available through an endowment for graduate students who have demonstrated outstanding performance in a course in the language and/or literature of Middle English or the English Renaissance. Professor Manzalaoui (1924-2015) was a scholar, teacher and friend to generations of students in Egypt, England and at the University of British Columbia. Those UBC students who took his course on Chaucer and other medieval topics will remember him for his lively classroom readings and informative lectures. He worked hard to impress on all of his students the importance of literature and its relation to life. The prizes will be made on the recommendation of the Faculty of Arts in consultation with the Faculty of Graduate and Postdoctoral studies. (First award available in the 2018/2019 winter session.)

**Mo Lin Yu Memorial Prize in the Faculty of Science**

A \$3,000 prize has been made available through an endowment established by Simmon Yu, son of Mo Lin Yu, for the top academic student who has completed their third year in the Faculty of Science at the University of British Columbia. This prize was created to honour the memory of Mo Ling Yu, the matriarch of the Yu family, who came to Canada in the 1980s. Mo Lin did not have the opportunity to study at UBC but always had a passion for learning and felt that young people should be encouraged in their endeavour to achieve academic excellence in higher education. The award is made on the recommendation of the Faculty of Science. (First award available in the 2018/19 winter session.)

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**NEW AWARDS – ANNUAL****British Columbia Graduate Scholarship**

Scholarships of \$15,000 each are offered annually by the Province of British Columbia to Canadian citizens or permanent residents registered in a graduate degree program in any field of study. The scholarships are made on the recommendation of the recipient's disciplinary Faculty or graduate program, in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/19 winter session.)

**Lawrence Burr UBC Thunderbird Golf Award**

A \$2,000 award is offered annually by Lawrence Burr (B.A. 1958, M.Sc. 1961, M.D. 1964) to a returning member of the UBC Thunderbird Golf Team who has demonstrated excellent leadership skills and is in good academic standing. Preference will be given to a member of the women's team. Dr. Burr was a member of his high school golf team, and continues to enjoy the



game decades later. The award is made on the recommendation of the Athletics Awards Committee. (First award available in the 2018/19 winter session.)

**Dentsply Sirona Award in Endodontics**

A \$2,500 award is offered annually to a student entering 4th year of the Doctor of Dental Medicine (D.M.D) program who demonstrates outstanding proficiency in Endodontics. The award is made on recommendation of the Faculty of Dentistry. (First award available in the 2018/19 winter session.)

**Kristian Domingo Memorial Award in Land and Food Systems**

A \$1,100 award is offered annually by the Kristian Domingo Foundation, in memory of Kristian Domingo and in honour of his inspirational spirit, strength of character and courage. The award is offered to an undergraduate student enrolled in the Faculty of Land and Food Systems who has overcome adversity in pursuit of their education and demonstrates leadership qualities. Kristian was a talented student athlete in high school, excelling at basketball and football, and was known to draw the best out of his peers both on and off the field. In 2014, prior to attending university and pursuing his dream of becoming a veterinarian, Kristian was diagnosed with cancer. As the disease progressed, Kristian was forced to give up competitive sports, but fought hard to continue his studies at UBC, drawing strength from his faith, family and friends. Cancer eventually took his life in the summer of 2016. The award is made on the recommendation of the Faculty of Land and Food Systems. (First award available in the 2018/2019 winter session.)

**Sukhi Ghuman Bursary**

A \$1,000 bursary is offered annually by the Vancouver International Bhangra Celebration Society (VIBC) for undergraduate students in the Faculty of Education in recognition of Sukhi Ghuman. Sukhi was one of the founding directors of the VIBC during its inception in 2004. She utilized her skills of marketing and communication to lead the organization as it grew from a dance competition to a multi-day festival. This bursary recognizes Sukhi's contributions to the VIBC as a leader and devoted volunteer, as well as her involvement in other cultural and arts organizations. The bursary is adjudicated by Enrolment Services. (First award available in the 2018/2019 winter session).

**Grant Thornton LLP Trail Integrated Community Clerkship Award**

Awards totalling \$10,000 are offered annually by Grant Thornton LLP to be distributed equally among M.D. students accepted into the UBC Faculty of Medicine Trail Integrated Community Clerkship program. The awards are made on the recommendation of the UBC Faculty of Medicine Southern Medical Program. (First award available in the 2018/19 winter session.)

**Huawei Scholarships in Computer Science**

Two scholarships of \$5,000 are offered annually by Huawei to support first-year masters students in the Department of Computer Science. The scholarships are made on the recommendation of the Department of Computer Science in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/2019 winter session.)

### **Huawei Scholarships in Physics**

A \$5,000 scholarship is offered annually by Huawei to support first-year masters students in the Department of Physics and Astronomy. The scholarship is for students studying quantum mechanics who have a chosen field of study in quantum dot technology, quantum computing or materials science applied to nano-scale fabrication techniques. Recipients will be selected based on their promise in quantum mechanics. To be considered, students must have a supervisor in one of the above areas of study. The scholarship is made on the recommendation of the Department of Physics and Astronomy in consultation with the Faculty of Graduate and Postdoctoral Studies. (First award available in the 2018/2019 winter session.)

### **Sharon Koshul Memorial Prize in Animal Law**

Prizes totalling \$1,000 are offered annually in memory of Sharon Koshul by her family, to a J.D. student enrolled in the Peter A. Allard School of Law who demonstrates academic excellence in a course in Animal Law. In years where no course in Animal Law is offered, consideration will be given to a student who demonstrates academic excellence in one or more “Topics in Public Law” courses. Compassion and caring for animals were essential parts of Sharon Koshul’s life and she would try to rescue any animals in need who crossed her path. She saw advancement in Animal Law as the most effective way to advocate for and to protect animals. The prizes are made on the recommendation of the Peter A. Allard School of Law. (First award available in the 2018/2019 winter session.)

### **Quang Khong Memorial Award**

A \$1,000 award is offered annually in memory of Quang Minh Khong (B.Com. 2007, Dip. (Acct) 2009, P.G.C.V. 2013) to an undergraduate student majoring in Finance at the UBC Sauder School of Business. Quang was an ambitious person who always strived to do his best. On February 26, 2016, Quang passed away at the young age of 30 after losing his battle against liver cancer. Quang was well respected within his community and loved by his family, friends and peers. He inspired many throughout his days at UBC, encouraging those around him to achieve their full potential. By establishing this award, Quang’s family and friends hope to continue to help and inspire Sauder students to be their best and achieve their full potential. Students must demonstrate involvement in the Sauder community; financial need may be considered. The award is made on the recommendation of the UBC Sauder School of Business. (First award available in the 2018/19 winter session.)

### **Bob Laycoe Award**

One or more awards, which may range from a minimum value of \$500 each to the maximum allowable under athletic association regulations, are offered annually, in honour of former Assistant Coach Bob Laycoe, to outstanding members of the Thunderbird varsity football team in any year of study who have demonstrated excellent leadership skills and good academic standing. The awards are made on the recommendation of the Athletics Awards Committee. (First award available in the 2018/2019 winter session.)

**Master of Journalism Bursary**

Bursaries are offered annually by the UBC Graduate School of Journalism to students in the Master of Journalism program who demonstrate unmet financial need. Available funding is determined annually based on enrolment in the program. The bursaries are adjudicated by Enrolment Services. (First award available in the 2018/2019 winter session.)

**Dr. Ravi Shah Bursary**

A \$1,000 bursary is offered annually by UBC Dentistry in honour of Dr. Ravi Shah, for a student enrolled in one of the Faculty's M.Sc. in Craniofacial Science and Clinical Specialty Diploma programs. Dr. Shah's dedication to teaching and outstanding leadership of Dentistry's International Relations Program have been instrumental to the continued success of the Faculty. The bursary is adjudicated by Enrollment Services. (First award available in the 2018/2019 winter session.)

**Zymeworks Michael Smith Laboratories Fellowship in Advanced Protein Therapeutics**

Two fellowships of \$20,000 each are offered annually by Zymeworks Inc. in collaboration with the Michael Smith Laboratories, to graduate students studying advanced protein therapeutics in the Michael Smith Laboratories. In addition to academic merit, candidates will be evaluated on the basis of experience in the area of advanced protein therapeutics and research excellence. Preference will be given to candidates who have an interest in addressing significant areas of unmet medical need and making a difference in the lives of people around the world. The fellowships are made on the recommendation of the Michael Smith Laboratories Awards Committee in consultation with the Faculty of Graduate and Postdoctoral Studies. (First fellowships available in the 2019/2020 winter academic session.)

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**PREVIOUSLY APPROVED AWARDS WITH CHANGES IN TERMS OR FUNDING SOURCE****ENDOWED AWARDS****7000 – UBC Blue & Gold Bursary**

**Rationale for Proposed Changes**

As discussed with the Office of University Counsel, gifts to this pooled fund will be directed to one endowment to be split between the two UBC campuses with the breakdown of the split to be detailed in the award description.

**Current Award Description**

Bursaries totalling \$1,400 have been made available through an endowment supported by various donors, along with matching funds from The University of British Columbia. Recipients will be undergraduate students who have demonstrated financial need and are Canadian citizens or permanent residents of Canada. The bursaries are adjudicated by Enrolment Services with preference to be adjudicated through the Blue & Gold Bursary program. (First Award Available in the 2018/2019 Winter Session)

**Proposed Award Description**

Bursaries totalling \$1,400 **\$10,200** have been made available through an endowment supported by various donors, along with matching funds from The University of British Columbia. ~~Recipients will be,~~ **for** undergraduate students at the **UBC Vancouver Campus and UBC Okanagan Campus** who have demonstrated financial need and are Canadian citizens or permanent residents of Canada. The bursaries are adjudicated by Enrolment Services ~~with preference to be adjudicated through the Blue & Gold Bursary program,~~ **with 80 percent of the UBC Blue & Gold Endowment Fund's annual spending allocation supporting the Vancouver Campus and 20 percent supporting the Okanagan Campus.** (First Award Available in the 2018/2019 Winter Session)

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**8687 – Alumni UBC Blue & Gold Bursary****Rationale for Proposed Changes**

As discussed with the Office of University Counsel, gifts to this pooled fund will be directed to one endowment to be split between the two UBC campuses with the breakdown of the split to be detailed in the award description.

**Current Award Description**

Bursaries totalling \$4,000 have been made available through an endowment established in honour of alumni UBC's 100th anniversary, along with matching funds from the University of British Columbia, for undergraduate students who demonstrate financial need. The bursaries are adjudicated by Enrolment Services. (First Award Available in the 2018/2019 Winter Session.)

**Proposed Award Description**

Bursaries totalling \$4,000 \$3,200 have been made available through an endowment established in honour of *alumni UBC's* 100th anniversary, along with matching funds from the University of British Columbia, for undergraduate students at the UBC Vancouver Campus and UBC Okanagan Campus who demonstrate financial need. The bursaries are adjudicated by Enrolment Services with 80 percent of the Alumni UBC Blue & Gold Endowment Fund's annual spending allocation supporting the Vancouver Campus and 20 percent supporting the Okanagan Campus. (First Award Available in the 2018/2019 Winter Session.)

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**3019 – Mo Lin Yu Memorial Prize in the Faculty of Arts****Rationale for Proposed Changes**

Donor has made an additional gift to endow their award which was previously funded annually.

**Current Award Description**

A \$3,000 prize is offered annually by Simmon Yu, son of Mo Lin Yu, for the top academic student who has completed their second year in the Faculty of Arts at the University of British Columbia. This prize was created to honour the memory of Mo Ling Yu, the matriarch of the Yu family, who came to Canada in the 1980s. Mo Lin did not have the opportunity to study at UBC but always had a passion for learning and felt that young people should be encouraged in their endeavour to achieve academic excellence in higher education. The award is made on the recommendation of the Faculty of Arts.

**Proposed Award Description**

A \$3,000 prize ~~is offered annually~~ has been made available through an endowment established by Simmon Yu, son of Mo Lin Yu for the top academic student who has completed their third year in the Faculty of Arts at the University of British Columbia. This prize was created to honour the memory of Mo Ling Yu, the matriarch of the Yu family, who came to Canada in the 1980s. Mo Lin did not have the opportunity to study at UBC but always had a passion for learning and felt that young people should be encouraged in their endeavour to achieve academic excellence in higher education. The award is made on the recommendation of the Faculty of Arts. (First award available in the 2019/20 winter session.)

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**6378 – Brahm Wiesman Memorial Scholarship in Community and Regional Planning****Rationale for Proposed Changes**

As directed by SCARP, approved by University Counsel and the June Board of Governors Meeting, the terms of this endowment have been revised to include global Indigenous communities as a research option for students.

**Current Award Description**

Scholarships totalling \$16,300 have been made available through an endowment created by Mrs. Madge Wiesman, and augmented by colleagues and friends, in memory of her husband, Professor Brahm Wiesman. Professor Wiesman was the Director of UBC's School of Community and Regional Planning (SCARP) for many years. The scholarships are offered to students in the School of Community and Regional Planning for travel abroad to Asia and Global South countries elsewhere in order to advance their SCARP-related research. The scholarships are made on the recommendation of the School of Community and Regional Planning in consultation with the Faculty of Graduate and Postdoctoral Studies.

**Proposed Award Description**

Scholarships totalling \$16,300 have been made available through an endowment created by Mrs. Madge Wiesman, and augmented by colleagues and friends, in memory of her husband, Professor Brahm Wiesman. Professor Wiesman was the Director of UBC's School of Community and Regional Planning (SCARP) for many years. The scholarships are offered to students in the School of Community and Regional Planning for travel abroad to Asia, ~~and~~ Global South countries elsewhere, **or Indigenous communities**, in order to advance their SCARP-related research. The scholarships are made on the recommendation of the School of Community and Regional Planning in consultation with the Faculty of Graduate and Postdoctoral Studies.

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**1787 – Claude Gardner Memorial Scholarship****Rationale for Proposed Changes**

As requested by the Faculty of Dentistry and approved by University Counsel, the year of study is being removed from the award description as the timing of the curriculum has changed. Removing the reference to the year of study and focussing the criteria solely on the required skill will ensure that the award description will not need to be revised in future if course curriculum changes.

**Current Award Description**

An \$800 scholarship has been endowed by alumni and friends of the Faculty of Dentistry in memory of Dr. Claude Gardner and his tremendous contribution, over many years, to the students and graduates of the Faculty and to the development of the dental profession in British Columbia. It is awarded to a D.M.D. student entering second year who has demonstrated growth and progress in the study of psychomotor skills. Performance in the first and second year dental

courses will be considered. The student must exhibit qualities of professionalism. The award is made on the recommendation of the Faculty of Dentistry in conjunction with the coordinator of the Psychomotor Skills course.

### **Proposed Award Description**

An \$800 scholarship has been endowed by alumni and friends of the Faculty of Dentistry in memory of Dr. Claude Gardner and his tremendous contribution, over many years, to the students and graduates of the Faculty and to the development of the dental profession in British Columbia. It is awarded to a D.M.D. student ~~entering second year~~ who has demonstrated growth and progress in the study of psychomotor skills. ~~Performance in the first and second year dental courses will be considered.~~ The student must exhibit qualities of professionalism. The award is made on the recommendation of the Faculty of Dentistry ~~in conjunction with the coordinator of the Psychomotor Skills course.~~

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## **8574 – Jane Heckman Scholarship in Choral Singing**

### **Rationale for Proposed Changes**

The donor has given an additional gift to convert their annual award into an endowed award.

### **Current Award Description**

A \$3,000 scholarship, payable over two years at \$1,500 per year, is offered by Dr. Nancy Heckman to honour the memory of her mother, Jane Heckman, and her passion for choral music. The award is given to an outstanding continuing student in the School of Music who demonstrates exceptional aptitude for and commitment to choral singing in the School's choral ensembles. The award is made on the recommendation of the School of Music and, in the case of a graduate student, in consultation with the Faculty of Graduate and Postdoctoral Studies.

### **Proposed Award Description**

A \$1,200~~\$3,000~~ scholarship, ~~payable over two years at \$1,500 per year,~~ **has been made available through an endowment established** ~~is offered~~ by Dr. Nancy Heckman to honour the memory of her mother, Jane Heckman, ~~and her passion for choral music.~~ **Jane studied voice at Julliard School and was the soprano soloist at the First United Methodist Church of Germantown, Pennsylvania, under the direction of Michael Korn. Jane's joyful singing inspired in her family a life-long love of choral music.** The award is given to an outstanding continuing student in the School of Music who demonstrates exceptional aptitude for and commitment to choral singing in the School's choral ensembles. **Based upon continued outstanding academic achievement the scholarship is renewable for a second year. Financial need may be considered.** The ~~award~~

**scholarship** is made on the recommendation of the School of Music and, in the case of a graduate student, in consultation with the Faculty of Graduate and Postdoctoral Studies.

## **ANNUAL AWARDS**

### **1030 – Clear Ocean Seafood Ltd. Award in Business Operations**

#### **Rationale for Proposed Changes**

The donor has expressed his intention to support students studying marketing at the graduate level, possibly coming from LFS, and with an interest in pursuing a career in the food industry. The Faculty of Graduate and Postdoctoral Studies has been added to the sentence regarding award administration to clarify that the award assignment would be handled by their office.

#### **Current Award Description**

Two awards of \$1,000 each are offered annually by Clear Ocean Seafood Ltd. for students in their third or fourth year of the Bachelor of Commerce program at the Sauder School of Business. Applicants need to be fluent in Mandarin and have a thorough understanding of Chinese culture and can be Canadian, permanent resident or international students. Preference will be given to students specializing in operations, logistics or related fields. The award is based on a combination of academic achievement, community involvement and interest in pursuing a career in operations or logistics. Clear Ocean Seafood Ltd. is a Richmond based scallop manufacturer & supplier. A global expert in importing, processing and exporting scallops, Clear Ocean Seafood Ltd. utilizes leading technology and research in its operations. The award is made on the recommendation of the Sauder School of Business.

#### **Proposed Award Description**

~~Two awards of \$1,000 each are~~ **A \$3,000 award is offered** annually by Clear Ocean Seafood Ltd. ~~for to a students in their third or fourth year of the Bachelor of Commerce program at the Sauder School of Business~~ **enrolled in the UBC Bachelor + Masters of Management Dual Degree, who has fulfilled the continuation requirements and transferred successfully to the Master of Management portion of the program.** **The award is based on a combination of academic achievement, community involvement and interest in pursuing a career in the food industry. Preference will be given to a student from Land and Food Systems who demonstrates the following interests and skills in descending order: an interest in food marketing, fluency in Mandarin, an understanding of Chinese culture. If no suitable candidates can be identified using the preceding criteria, preference will be given to a student from any prior area of study who has an interest in food marketing.** ~~Applicants need to be fluent in Mandarin and have a thorough understanding of Chinese culture and can be Canadian, permanent resident or international students. Preference will be given to students specializing in operations, logistics or related~~



~~fields. The award is based on a combination of academic achievement, community involvement and interest in pursuing a career in operations or logistics.~~ Clear Ocean Seafood Ltd. is a Richmond based scallop manufacturer & supplier. A global expert in importing, processing and exporting scallops, Clear Ocean Seafood Ltd. utilizes leading technology and research in its operations. The award is made on the recommendation of the UBC Sauder School of Business, in consultation with the Faculty of Graduate and Postdoctoral Studies.

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## **1042 – Maureen Howe AWF Lifetime Achievement Award**

### **Rationale for Proposed Changes**

The sentence was added in to provide linkage between Maureen Howe and the Association for Women in Finance (AWF) as there wasn't really any indication of that before. It makes sense to add it in because AWF is the one who is actually funding this award in Maureen's honour over the next 10 years, the idea of creating the award came just after she received that award from AWF and AWF is the one that initiated the creation of this award.

### **Current Award Description**

A \$3,750 award is offered annually in honour of Maureen Howe to a female undergraduate student entering third year of the Bachelor of Commerce program at the UBC Sauder School of Business who has achieved outstanding academic merit. Preference is given to a student who is specializing in finance, has a history of community service, plans to pursue a career in finance and has demonstrated an ability to overcome adversity. Maureen has held various positions as a former Managing Director of Equity Research with RBC Capital Markets and is currently on the board of directors of several Canadian companies and foundations. The award is made on the recommendation of the UBC Sauder School of Business. (First Award Available in the 2017/2018 Winter Session.)

### **Proposed Award Description**

A \$3,750 award is offered annually in honour of Maureen Howe to a female undergraduate student entering third year of the Bachelor of Commerce program at the UBC Sauder School of Business who has achieved outstanding academic merit. Preference is given to a student who is specializing in finance, has a history of community service, plans to pursue a career in finance and has demonstrated an ability to overcome adversity. Maureen has held various positions as a former Managing Director of Equity Research with RBC Capital Markets and is currently on the board of directors of several Canadian companies and foundations. Maureen is also a past recipient of the Association of Women in Finance (AWF) Lifetime Achievement Award for her contribution to the field of finance. The award is made on the recommendation of the UBC Sauder School of Business.

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## **2766 – David Roberts Prize in Legal Writing**

### **Rationale for Proposed Changes**

The award was established to recognize students' achievements in legal writing. When this award was established, Public Law (Law 251) had a legal writing component that students could be evaluated by/from. Over the years, the legal writing component moved from Public Law to other first year courses. As this happened, the law awards committee found it difficult to adjudicate to an appropriate student. The law awards committee suggested not listing a specific course as it is limiting, rather broadening the award language so that a larger pool of students becomes available. This new language also allows for the committee to look outside of first year courses when necessary.

### **Current Award Description**

Prizes totalling \$2,000 are offered by The Advocate, a legal journal published by the Vancouver Bar Association. The awards are made on the recommendation of the Faculty for outstanding achievements in Law 251 (Public Law).

### **Proposed Award Description**

Prizes totaling \$2,000 are offered annually by The Advocate, a legal journal published by the Vancouver Bar Association, to J.D. students who demonstrate outstanding achievement in legal writing. Preference will be given to first year students. The awards prizes are made on the recommendation of the Peter A. Allard School of Law Faculty for outstanding achievements in Law 251 (Public Law).

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## **5382 – Fluor Canada Ltd. Scholarship in Mechanical Engineering**

### **Rationale for Proposed Changes**

Fluor has requested that the changes occur to ensure that there is a multi-disciplinary nature to the awards being given. The change is also in line with the business interests of Fluor as they have a focus in the mining and metals sector. This change allows for a larger candidate pool to be considered for these awards.

### **Current Award Description**

An award of \$1,750 is offered annually by Fluor Canada Ltd., to a student entering their 3rd or 4th year of a program leading to an undergraduate degree in Mechanical Engineering. Preference will be given to a student entering 4th year. Candidates must have achieved at least a B average

in their previous year of study and have demonstrated leadership and initiative through organization of and/or participation in campus and community activities. The award is made on the recommendation of the Head of the Department of Mechanical Engineering.

**Proposed Name: Fluor Canada Ltd. Scholarship in Civil, Electrical and Mechanical Engineering**

**Proposed Award Description**

An award scholarship of \$1,750 is offered annually by Fluor Canada Ltd., to a student entering their 3rd or 4th year student in one of the following disciplines: Civil, Electrical or Mechanical Engineering, who has actively participated in a multi-disciplinary student design team, of a program leading to an undergraduate degree in Mechanical Engineering. Preference will be given to a student entering 4th year student with an interest in pursuing a career in the mining and metals sector, and/or the Engineering, Procurement and Construction industry. Candidates must have achieved at least a B average in their previous year of study and have demonstrated leadership and initiative through organization of and/or participation in campus and community activities. The award scholarship is made on the recommendation of the Head of the Department of Mechanical Engineering Faculty of Applied Science.

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**2195 – Fluor Canada Ltd Award in Mineral Process Engineering**

**Rationale for Proposed Changes**

Fluor has requested that the changes occur to ensure that there is a multi-disciplinary nature to the awards being given. The change is also in line with the business interests of Fluor as they have a focus in the mining and metals sector. This change allows for a larger candidate pool to be considered for these awards.

**Current Award Description**

An award of \$1,750 is offered annually by Fluor Canada Ltd., to a student entering their 3rd or 4th year of a program concentrating on Mineral Process Engineering. Preference will be given to a student entering 4th year. Candidates must have achieved at least a B average in their previous year of study and have demonstrated leadership and initiative through organization of and/or participation in campus and community activities. The award is made on the recommendation of the Head of the Department of Mining Engineering.

**Proposed Name: Fluor Canada Ltd Award Scholarship in Chemical, Materials and Mining Mineral Process Engineering**

**Proposed Award Description**

An award scholarship of \$1,750 is offered annually by Fluor Canada Ltd., to a student entering their 3rd or 4th year of a program concentrating on Mineral Process Engineering student in one

of the following disciplines: Chemical, Materials or Mining Engineering, who has actively participated in a multi-disciplinary student design team. Preference will be given to a 4<sup>th</sup> year student entering 4th year with an interest in pursuing a career in the mining and metals sector, and/or the Engineering, Procurement and Construction industry. Candidates must have achieved at least a B average in their previous year of study and have demonstrated leadership and initiative through organization of and/or participation in campus and community activities. The award scholarship is made on the recommendation of the Faculty of Applied Science. Head of the Department of Mechanical Engineering.

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## **2819 – Trial Lawyers Association of BC Kenneth S Fawcus Memorial Prize in Civil Litigation**

### **Rationale for Proposed Changes**

As requested by the Trial Lawyers Association of BC, the memorial element of the award has been removed. Additional degree information has been added to clarify that this award is for J.D. students.

### **Current Award Description**

Two prizes of \$500 each are awarded to students in the Peter A. Allard School of Law who achieve high academic standing in a course in Civil Litigation. These awards are given by the Trial Lawyers Association of British Columbia to honour the Hon. Kenneth S. Fawcus who throughout his career, both as a lawyer and as a Justice of the Supreme Court of British Columbia, exemplified the best traditions of the bar. The donor hopes that these memorial prizes will instill in its recipients a desire to strive for excellence in all aspects of trial practice. The awards are made on the recommendation of the Peter A. Allard School of Law.

### **Proposed Name: Trial Lawyers Association of BC Kenneth S Fawcus Memorial Prize in Civil Litigation**

#### **Proposed Award Description**

Two prizes of \$500 each are awarded-offered annually by the Trial Lawyers Association of British Columbia to J.D. students in the Peter A. Allard School of Law who achieve high academic standing in a course in Civil Litigation. These awards are given by the Trial Lawyers Association of British Columbia to honour the Hon. Kenneth S. Fawcus who throughout his career, both as a lawyer and as a Justice of the Supreme Court of British Columbia, exemplified the best traditions of the bar. The donor hopes that these memorial prizes will instill in its recipients a desire to strive for excellence in all aspects of trial practice. The awards are made on the recommendation of the Peter A. Allard School of Law.





19 September 2018

To: Vancouver Senate

From: Senate Curriculum and Admissions Committees

Re: BEST - Forest Bioeconomy Sciences and Technology (approval)

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The Senate Curriculum and Admissions Committees have reviewed the material forwarded to them by the Faculty of Forestry and enclose those proposals they deem ready for approval.

The following is recommended to Senate:

**Motion:** *“That the new BEST - Forest Bioeconomy Sciences and Technology degree program, new course code, new courses, and new minor be approved.”*

Respectfully submitted,

Dr. Peter Marshall, Chair, Senate Curriculum Committee  
Dr. Carol Jaeger, Chair, Senate Admissions Committee

*New course code*

BEST – Forest Bioeconomy Sciences and Technology

*New courses*

**BEST 200** (3) Foundations in Bioproducts and the Bioeconomy; **BEST 201** (3) Plants, Carbon, and Environment; **BEST 202** (3) Alternative Energy Systems; **BEST 203** (3) Ecology of Managed Ecosystems; **BEST 204** (3) Land Use Management and Planning; **BEST 300** (3) Biobased Polymers and Bioproducts; **BEST 301** (3) Bioenergy; **BEST 302** (3) Laboratory in Bioeconomy Technology (I); **BEST 303** (3) Applied Biotechnology for Bioproducts; **BEST 304** (3) Laboratory in Bioeconomy Technology (II); **BEST 400** (3) Biomimicry and Biocomposites; **BEST 401** (3) Carbon and Energy Economics; **BEST 402** (3) Industrial Ecology; and **BEST 403** (3) Integrated Strategies for Bioproduct Innovation.

*New minor*

B.Sc. In Forest Bioeconomy Sciences and Technology, Minor in Commerce

*New program*

Bachelor of Science in Forest Bioeconomy Sciences and Technology

**The University of British Columbia**

Faculty of Forestry

**Proposal**

**Bachelor of Science in Forest Bioeconomy Sciences and Technology  
Degree Program**



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## **1. Executive Summary**

### **1.1 Overview**

The University of British Columbia (UBC) is a comprehensive research university, consistently ranked among the 40 best institutions in the world. Since 1915, it has supported an exceptional learning environment that fosters global citizenship, advances civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada, and the world.

The proposed Bachelor of Science (B.Sc.) in Forest Bioeconomy Sciences and Technology (BEST) degree, offered in the Faculty of Forestry, will provide a holistic education focused on the scientific, economic, and policy issues generated by transforming forest and plant based biomass into value-added renewable products and energy that stimulate sustainable development and wise land use. The program will teach methodology and practical skills for the understanding and advancement of technologies, innovative products and processes, economic forces and policy, and land use development that will advance the emergent bioeconomy paradigm.

Forest Bioeconomy Sciences and Technology is a rapidly growing discipline that emphasizes key components of knowledge-based, innovative production and use of forest and agro bio-waste to create renewable products, fuels, and energy for sustainable development. In addition, understanding the economic, land use and policy implications are fundamental components of the discipline.

The proposed BEST program addresses a stated inclusion in the 2017 WorkBC's labour market report that identifies natural and applied science policy researchers, consultants and program officers as high demand occupations in the Province.<sup>1</sup> More importantly, the proposed degree program answers the Provincial government's call to, *"develop more degree and certification programs to increase the number of skilled workers in B.C.'s forestry sector, focusing in growing innovation and the manufactured wood products sector."* (Reference 1.1)

### **1.2 Credential**

The proposed credential awarded will be the Bachelor of Science (B.Sc.) in Forest Bioeconomy Sciences and Technology. The program will balance theory and practice, combining interdisciplinary knowledge across the Faculty of Forestry. The field of study encompasses renewable resource technologies, renewable energy and materials, sustainable land use policy and business, and resource conservation.

### **1.3 Location**

The University of British Columbia's Point Grey campus is the location for classroom education and administration of the program.

### **1.4 Faculty Offering Program**

The proposed degree program will be housed within the Faculty of Forestry. Courses will be taught by the three departments within the Faculty: Forest Resources Management, Forest and Conservation Sciences, and Wood Science. The program will be administered by the Department of Wood Science.

### **1.5 Program Start Date**

The projected program start date is September 2019, dependent on Ministry approval.

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<sup>1</sup> <https://www.workbc.ca/Labour-Market-Industry/High-Demand-Occupations/High-Demand-Occupations.aspx>

## **1.6 Program Completion Time**

Anticipated time for completion of the full program is four years. Student participation in the Faculty's Co-op option will follow the Faculty's five-year Co-op program map.

## **1.7 Objectives and Learning Outcomes**

The Forest Bioeconomy Sciences and Technology degree will offer a comprehensive program for the scientifically minded and environmentally motivated Forestry student. The proposed program emphasizes the pragmatic, sustainable use of natural resources to meet the growing global demand for goods and energy, while minimizing negative environmental and societal impacts. The program will create graduates who have abilities and practical skills to work across disciplines in order to serve as agents of change in traditional and non-traditional forest industries to become leaders for the emerging bioeconomy industries.

Learning outcomes will prepare students to work towards solutions for complex issues such as greenhouse gas emission reduction and development of fossil fuel alternatives, biomass conversion into innovative bioproducts, sustainable land use development, and the role of government, industry, and nongovernmental organizations (NGOs) in a functioning bioeconomy. In addition to theoretical knowledge, students will also attain project management, marketing and social science skills.

The BEST degree will enable students to:

- Understand technologies for characterizing and converting biomass into bioenergy and biofuels
- Explain the biorefinery concept including resource procurement and transport, biomass pretreatment, and production of fuels, energy, and products
- Develop tools to design innovative bioproducts with low environmental footprint
- Compare bioenergy, such as wood pellets, and liquid biofuels to other alternative energy technologies
- Utilize biotechnology methods from plant growth through biochemical pathways for the transformation of biomass into useful materials
- Assess the socio-environmental impacts of managed resources used in the bioeconomy
- Evaluate and project resource consumption and greenhouse gas emission for biorefineries
- Apply participatory methods and community-based approaches to access and develop renewable enterprises
- Evaluate the potential role of bioenergy in economies and communities at different spatial scales
- Build employable business skills in graduates such as critical thinking, project management, and leadership

## **1.8 Contribution to UBC's Mandate and Strategic Plan**

In keeping with UBC's vision, the proposed BEST degree will provide a comprehensive education covering the science along with the economic, environmental, and social sustainability in the emerging bioeconomy, which aligns with the University Strategic Plan's commitment to, "[exemplify] all aspects of economic, environmental, and social sustainability." Graduates from the program will be exceptional global citizens, who promote the values of a civil and sustainable society with an emphasis on the decarbonization of society to help mitigate global climate change. The BEST program will educate future scientists, managers, and decision makers to lead the responsible development of the emerging Canadian bioeconomy industry, while leveraging Canada's vast resources and protecting the nation's diverse ecosystems.

## **1.9 Delivery Methods**

The program consists of required coursework addressing core theory and application and teaches transferable skills through the lab techniques courses and project-based assignments in upper-level courses. The degree consists of 122 credits of required coursework including face-to-face lectures and seminars, laboratory sessions, and a five-year Co-op learning option.

## **1.10 Linked Learning Outcomes and Curriculum Design**

The proposed curriculum will address the learning outcomes described above through existing and new courses emphasizing core theory and skills while enforcing the principal theme of utilizing biomass for sustainable economic growth throughout the program. The proposed curriculum is an amalgam of fundamental, applied and social sciences that reinforces the interdependent nature of the bioeconomy, as defined in Section 1.1. The program will teach students to pose and evaluate critical questions in resource utilization combined with hands-on laboratory activities for the demonstration of technologies.

## **1.11 Program Strengths**

UBC ranks among the 40 top research universities internationally. Additionally, the Center for World University Rankings ranked UBC Forestry one of the top 10 research subjects in 2017 (out of 1,000 universities).<sup>2</sup> Ranking is based on the number of research articles published in top-tier journals by Forestry faculty members.

The proposed BEST program is well positioned within the Department of Wood Science as many faculty members are performing state-of-the-art research in biomaterials, bioenergy, and wood-based biocomposites. Wood Science faculty members include Canada's leading biofuels expert and member of the IEA bioenergy taskforce, the Canada Research Chair in Advanced Renewable Materials, the Canada Research Chair in Sustainable Functional Biomaterials, and the Canada Research Chair in Wood and Fibre Quality (term completed).

Several faculty are members of the Bioproducts Institute Cluster, which focuses on the transformation of plant-based biomass into advanced materials for society. This Cluster aligns with the university's goal of being a world leader in innovative forest bioproducts as seen through the recent support to the area with the hiring of the President's Excellence Chair in Forest Bioproducts and two multi-million dollar CFI infrastructure grants. The innovative research of the Bioproducts Institute Cluster will influence the program and provide opportunities for the program's continued growth that includes novel examples in the classroom and direct connections to industry within British Columbia (e.g. BC Pulp and Paper Bio-Alliance) and Canada.

## **1.12 Support and Recognition from Other Post-Secondary Institutions and Professional Organizations**

The Faculty of Forestry has a strong relationship with Beijing Forestry University and Nanjing Forestry University. UBC Forestry is committed to success of established 3+2 transfer programs already in place for other undergraduate programs within the Faculty. To support BEST program development, UBC Forestry held discussions and developed plans with these universities about admittance of students into the 3+2 transfer program from other degree programs not currently part of the transfer agreement. Based on the successes of the existing 3+2 programs and the recognized benefits of the proposed program to

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<sup>2</sup> <http://cwur.org/2017/subjects.php>

their students, BFU and NFU support the program's development (Reference 2.3). China is an emerging market in biorefineries and will likely become the largest producer of biofuels and bioproducts, justifying their desire for a program like BEST and serving as an incentive to send students through the 3+2 program to UBC to participate in the new program.

Additionally, the Council of Forest Industries (COFI) offers support for the proposed BEST degree program. The Council's President confirms the "high growth global market for biofuels" and states, "it is important to ensure that we can attract new talent into our industry." (Reference 2.4)

### **1.13 Related Programs at UBC and in British Columbia**

The BEST program provides the university with a novel curriculum at the undergraduate level. Currently, no undergraduate program at UBC covers the material of the proposed BEST program comprehensively. The Master's of Engineering Leadership in Green Bioproducts and Clean Energy have some similar content that is covered; however, those programs provide curriculum targeted towards mid-career researchers with industrial experience. Thus, there is synergy between the proposed BEST program and these graduate programs, but they do not overlap. Other university faculties offer individual courses related to bioeconomy sciences, many only at the graduate level.

Faculties and Departments that offer individual courses addressing bioeconomy topics include:

- The Faculty of Forestry, Department of Forest Resources Management
- The Faculty of Forestry, Department of Wood Science
- The Faculty of Land and Food Systems
- The Faculty of Arts, Department of Geography
- The Faculty of Arts, Department of Sociology
- The Faculty of Applied Science

Further, the developing UBC Bioproducts Institute Cluster is in a process of branding itself to be a leader in the province, Canada and North America. This new undergraduate program will offer additional presence in the area, while the Bioproducts Institute Cluster will provide a conduit to other faculties that can help nurture a symbiotic relationship that includes guest speakers and campus-wide seminars in the bioeconomy field.

Notably, no other university in British Columbia offers a degree program.

### **1.14 Institutional Contact**

Dr. Scott Rennekar  
Associate Professor, Department of Wood Science  
scott.rennekar@ubc.ca  
604-827-0637

## **2. Program Description and Specification**

### **2.1 Need for the program**

The Canadian government acknowledges that the forest bioeconomy sector is becoming as important as the traditional forestry sector. To this point, Natural Resources Canada's Canadian Forest Service received a federal mandate to increase the competitiveness of the Canadian forest sector. This mandate is occurring by the promotion of the forest bioeconomy through research, increasing public awareness of the

economic and environmental benefits of bioproducts, and ensuring that federal policies guarantee productive, sustainable, and healthy forests in tandem with a productive forest products industry.<sup>3</sup> To date, there is no unified definition of the bioeconomy. Concepts like green economy and circular economy convey similar connotation, yet neither are as specific in concept as the bioeconomy paradigm. The Canadian Council of Forest Ministers defines the forest bioeconomy as “economic activity generated by converting sustainably managed renewable forest-based resources, primarily woody biomass and non-timber forest products, into value-added products and services using novel and repurposed processes.” In addition, there is consensus within the bioenergy, innovative bioproducts, and land use management research communities that the bioeconomy is understood as the knowledge-based production and utilisation of forest and agro-based resources using innovative principles and product development and processes to sustainably provide goods and services across all economic domains. As it is applied to the forest products industry, the bioeconomy encompasses the decarbonisation of society by creating innovative materials, feedstocks, and energy for new applications such as: cross-laminated timber to make tall wood buildings; pulp residues to make carbon fibre for automobiles and supercapacitors; pulp derived nanoparticles for security coatings; ultra-lightweight foams for energy efficient building; hemp and natural fiber composites for construction; cellulosic biochemicals for nylon production; *in planta* grown therapeutic compounds for disease treatment; and biocatalysts for greener production of adhesives. Essentially, the bioeconomy emphasizes the transformation of localized resources from forests, fields, and municipal wastes for the use by local and multinational companies outside the traditional forest products sector.

The bioeconomy is a transformative paradigm that focuses on the current forest and agricultural industries with sustainable resource and supply chains. *Sciences of the Forest Bioeconomy Sciences and Technology* program reflects the interdisciplinary approach required that blends principles in chemistry and biology with scientifically grounded methods focusing on how-to understand, measure, and transform biomass, along with social sciences of engaging stakeholders and measure influences and consequences that are tied together to create experts who can speak to diverse audiences. Further, technology refers to the innovative methods that take advantage of scientific breakthroughs for practical applications. In this program, *Bioeconomy Technology* focuses on the rapidly developing processes to harvest and store sustainable energy and the formation of biobased products with functional applications. In addition, understanding the economic, land use, and policy implications are fundamental components of the applied discipline. The program teaches innovative technologies to address world issues such as GHG emissions, fossil fuels alternatives, and renewable materials and energy production and use.

As early as 2009, Canada had over 200 businesses producing or developing bioproducts and grossed \$1.3B on bioproduct sales of which \$433M were exports. In addition, bioeconomy jobs employed over 3,000 people in production, research and development, and engineering.<sup>4</sup> In 2017, the Canadian Council of Forest Ministers developed a framework for Canada’s forest bioeconomy that supports the increase of investment in the bioeconomy, resultant growth of jobs in the sector, new businesses, new supply chains, and enhanced engagement with stakeholders, notably Indigenous communities. Training programs, promotion of career paths in traditional and non-traditional forest industries and an overarching theme of sustainability provide justification for the need of an education platform in the area.<sup>5</sup>

Only one university in Canada, the University of Toronto, offers a similar undergraduate program, Forest Biomaterials Science. However, this program teaches a, “*fundamental knowledge of wood structure, properties and attributes, as well as life cycle analysis, alternative energy strategies, and innovative product development,*” and does not have the strong biotechnology and social science component of the

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<sup>3</sup> NRCan Forest Bioproducts, 2007. Fo4-15/2007

<sup>4</sup> Agriculture and Agri-Food Canada, 2015. AAFC No. 12322E

<sup>5</sup> Canadian Council of Forest Ministers Innovation Committee. Canadian Forest Service Publications: <http://cfs.nrcan.gc.ca/publications>.

proposed BEST program.<sup>6</sup> Furthermore, only two other North American undergraduate programs compare with the proposed BEST program: Virginia Tech's Sustainable Biomaterials degree and Auburn University's Sustainable Biomaterials and Packaging. Other programs such as Mississippi State University's Sustainable Bioproducts major and Oregon State University's Renewable Materials major are not comprehensive academic programs in the bioeconomy sciences.

The dearth of programs in the field does not suggest an irrelevance of bioeconomy sciences. In fact, research shows a trend toward growth in this academic field. For example, 2018 will be Auburn University's inaugural academic year of their program, demonstrating the emergent response from institutions to this identified academic gap in the non-traditional forestry sector.

The Faculty of Forestry distributed a survey to determine student demand in the proposed BEST program. Of the 100 respondents, ranging from Year One to Year Five and spanning all majors in Forestry, 21% would "definitely have" chosen the BEST degree if it had been offered when they started university. Additionally, 38% were "likely to consider" the BEST and 22% were neutral. These results indicate that there is clear interest in the proposed program among current students. (See Reference 3.1 for complete survey)

Further, as recently as March 23, 2018, the Ministry of Advanced Education, Skills, and Training provided the University of British Columbia with a one-time contribution to support specific initiatives. Of the \$410K contribution, \$300K is dedicated to the curriculum development of a new undergraduate bioeconomy degree program in the Faculty of Forestry that aligns with the Minister of Education's call to development more forestry-based certification and degree programs (Reference 1.2).

*"The Canadian bioproducts sector is well on its way to consolidate its status as a global player in the growing bioeconomy."*<sup>7</sup> Employment in the bioeconomy is growing and providing new career opportunities for our future graduates. Recent data from the US Department of Energy<sup>8</sup> indicates the renewable energy industry provided 677,544 jobs in 2016—a 6% increase from 2015. Specifically, woody biomass fuel for energy and cellulosic biofuels supports approximately 3% of the overall fuels workforce in the United States. Here in British Columbia, companies such as Pinnacle Renewable Energy provide more than 250 jobs in bioenergy pellet production. In Ontario, Comet Biorefining Inc. is building the world's largest biomass sugar facility, offering a wide portfolio of potential careers within Canada.

The proposed program has garnered support from Canadian-based businesses. FPInnovations, a strong supporter of Faculty of Forestry projects states that they, *"would view the new BEST program's graduates as an attractive source of potential employees,"* as the program would teach methodological and practical skills for understanding scientific and policy development as it relates to Canada's bioeconomy growth. (Reference 2.1)

For similar reasons, Steeper Energy Canada, Ltd supports the proposed program. They see the potential for hiring graduates with knowledge and skills to, *"bridge the gap between research and development on one hand, and the policy makers."* Steeper's CEO predicts that an increase in the talent pool of potential hires from a program like BEST will be desirable to many forest-based companies working with bioproducts and bioenergy due to the current, *"[difficulty] to find bioeconomy experts that understand both the technical and the commercialization."* (Reference 2.2)

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<sup>6</sup> <http://forestry.utoronto.ca/undergraduate-programs/>

<sup>7</sup> Invest in Canada Foreign Affairs, Ottawa, Ontario, CANADA Catalogue No: FR5-38/17-2013E-PDF 978-1-100-23076-4 Winter 2014

<sup>8</sup> [https://energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report\\_0.pdf](https://energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report_0.pdf)



## 2.2 Program Objectives

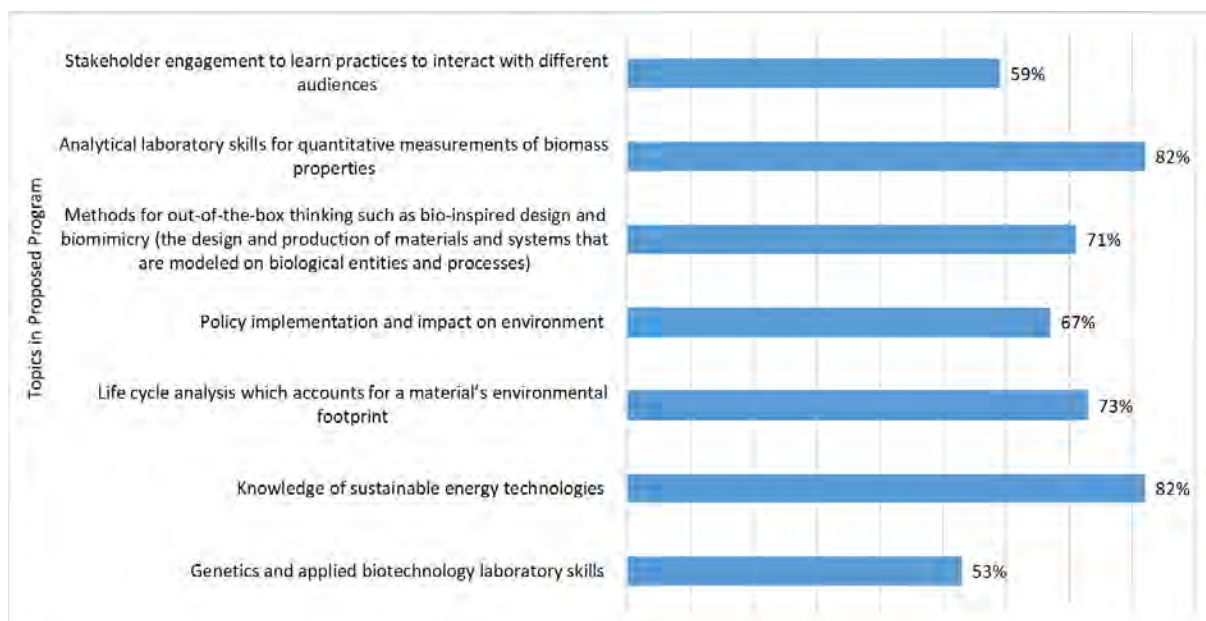
The proposed program will teach students to pose and evaluate critical questions in resource utilization combined with hands-on laboratory activities for the demonstration of technologies. It will enable students to work independently and in groups to apply the knowledge and skills they have acquired to practical problems in bioproducts or bioenergy. Students will be required to integrate across domains, communicate their project results through both written reports and oral evaluations. In addition, the upper-level lab techniques courses will allow students to apply novel approaches in analytical characterization of biomass and conversion into bioproducts and bioenergy.

The BEST program will enable students to:

- Measure and implement quantitative sustainability metrics,
- Formulate and develop innovation in bioproduct material design and use,
- Implement biotechnology in the growth and conversion of biomass,
- Utilize social science philosophies in defining problems and engaging stakeholders,
- Apply scientific principles for the analytical characterization of biomass and bioproducts,
- Develop tools to design bioproducts from wood and mill waste resources with low environmental footprints to specific performance requirements.
- Use business acumen for markets and products geared towards the bioeconomy.

Based on the student demand survey given to all students in the Faculty of Forestry, there is significant interest in the core learning objectives in the proposed program curriculum outlined in Section 1.7 and 2.2 (Reference 3.1).

### Student Interest in Proposed Curriculum Topics for Projected Career Development



## 2.3 Target Students

The BEST program will attract undergraduates interested in renewable resource technologies, resource conservation and reuse, sustainable land use development, and regulatory practices in renewable energy and materials.

The target audience comprises domestic and international potential undergraduate students. The Faculty expects to admit between 25-30 students per year, consistent with the student demand survey responses (see Reference 3.1). In partnership with Chinese universities and recognizing the shortage of programs in the United States, we expect the majority of international students will come from China and the United States.

## 2.4 Degree Requirements

The proposed 122-credit program is designed to include the following components:

**Core curriculum:** 95 credits

Core themes (new courses only)

- THEME 1: Foundations in scientific and analytical thinking
- THEME 2: Plant structure, biology and chemistry
- THEME 3: Innovation in applied biotechnology, bioproducts and bioenergy
- THEME 4: Integration for sustainability and innovation

Transferable Skills:

- Project management
- Problem solving
- Statistical analysis
- Understanding of government and industry policies and regulatory implications
- Sustainable approaches to product and energy development

These core themes and skills will be taught through existing courses and fourteen new courses that integrates multiple disciplines from the social, scientific, economic, and conservation fields.

**Restrictive electives:** 9-credits

Students are required to take three credits from the following list of social science-based courses:

- GEOG 310 Environment and Sustainability
- GEOG 318 Sustainability in a Changing Environment
- GEOG 319 Environmental Impact Assessment
- POLI 375 Global Environmental Politics
- SOCI 342 Consumers and Consumption

Students are required to take three credits from the following list of commerce courses:

- COMM 329 Principles of Organizational Behaviour
- COMM 457 Fundamentals of Financial Accounting
- COMM 465 Marketing Management

Students are required to take three credits from the following list of Natural Resources Conservation courses:

- CONS 200 Foundations of Conservation

- CONS 340 Introduction to Geographic Information Systems for Forestry and Conservation

The social science elective options GEOG 318 and GEOG 319 require GEOG 310 as a pre-requisite. GEOG 310 would be the elective course in Year 2 for students planning to take GEOG 318. The commerce elective option COMM 465 requires ECON 102 as a pre-requisite. ECON 102 would be the elective choice in Year 1, Term 2 or Year 2 for students planning to take COMM 465.

**Electives:** 18-credits

Students will complete six 3-credit courses. These courses are unrestricted electives. However, unrestricted elective courses may need to be used for completion of pre-requisites for restricted elective courses in Year 3 (where applicable).

**Minor in Commerce (optional):** 18-credits

Students can choose to obtain a Minor in Commerce, providing additional education in business operations to their skill set.

The Minor in Commerce courses are:

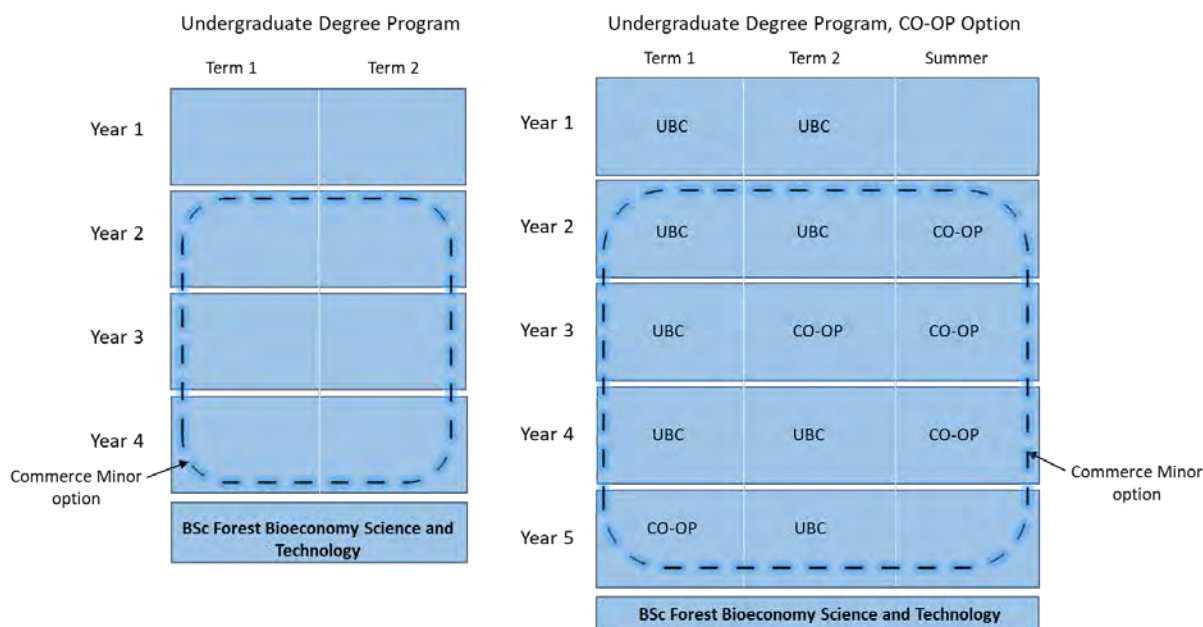
- COMM 329 Principles of Organizational Behaviour
- COMM 457 Fundamentals of Financial Accounting
- COMM 465 Marketing Management
- COMM 473 Business Finance
- COMM 493 Strategic Management in Business

and one of:

- COMM 398 Introduction to Business Processes and Operations
- COMM 458 Fundamentals of Managerial Accounting

## 2.5 Program Overview

### Forest Bioeconomy Sciences and Technology



### Co-operative Education Option

Students enrolled in the Forest Bioeconomy Sciences and Technology program will have the option to participate in Co-operative education. The Co-op program will allow students to gain paid work experience related to their degree.

### New Courses

Fourteen new courses are proposed to deliver the specialized learning objectives of the program.

- BEST 200 Foundations in Bioproducts and the Bioeconomy
- BEST 201 Plants, Carbon, and Environment
- BEST 202 Alternative Energy Systems
- BEST 203 Ecology of Managed Ecosystems
- BEST 204 Land Use Management and Planning
- BEST 300 Biobased Polymers and Bioproducts
- BEST 301 Bioenergy
- BEST 302 Laboratory in Bioeconomy Technology (I)
- BEST 303 Applied Biotechnology for Bioproducts
- BEST 304 Laboratory in Bioeconomy Technology (II)
- BEST 400 Biomimicry and Biocomposites
- BEST 401 Carbon and Energy Economics
- BEST 402 Industrial Ecology
- BEST 403 Integrated Strategies for Bioeconomy Innovation

### Existing Core Courses

- BIOL 121 Genetics, Evolution and Ecology
- CHEM 121 Structure and Bonding in Chemistry
- CHEM 123 Thermodynamics, Kinetics and Organic Chemistry

- CHEM 233 Organic Chemistry for the Biological Sciences
- CONS 101 Introduction to Conservation
- CONS 425 Sustainable Energy: Policy and Governance
- ECON 101 Principles of Microeconomics
- ENGL 112 Strategies for University Writing
- FRST 231 Introduction to Biometrics
- FRST 302 Forest Genetics
- FRST 318 Forest and Conservation Economics
- GEOB 102<sup>1</sup> Our Changing Environment: Climate and Ecosystems
- MATH 100<sup>2</sup> Differential Calculus with Applications to Physical Sciences and Engineering
- WOOD 225 Communications Strategies
- WOOD 461 Globalization and Sustainability
- WOOD 465 Wood Industry Business Management

Core Course Options- choose one of the following:

- SOCI 101 Social Interaction and Culture
- SOCI 102 Inequality and Social Change

<sup>1</sup> Students may take CONS 210 instead of GEOB 102 for credit.

<sup>2</sup> Students may take MATH 180 or 184 (4 credits) or MATH 110 (6 credits) instead of MATH 100, 102, or 104 (3 credits), but the credit difference cannot be applied towards program elective requirements.

### Restricted Electives

- COMM 329 Principles of Organizational Behaviour
- COMM 457 Fundamentals of Financial Accounting
- COMM 465 Marketing and Management
- CONS 200 Foundations of Conservation
- CONS 340 Introduction to GIS for Forestry and Conservation
- GEOG 310 Environment and Sustainability
- GEOG 318 Sustainability in a Changing Environment
- GEOG 319 Environmental Impact Assessment
- POLI 375 Global Environmental Politics
- SOCI 342 Consumers and Consumption

Minor Course Options- choose one of the following:

- COMM 398 Introduction to Business Processes and Operations
- COMM 458 Fundamentals of Management Accounting
- COMM 473 Business Finance
- COMM 493 Strategic Management in Business

## 2.6 Admission Requirements

The Faculty will accept applications from students with varying educational preparation:

- Following graduation from secondary school,
- Post-secondary transfer students

Students entering from secondary school must have met the University entrance requirements and have completed Principles of Mathematics 12 or Pre-Calculus 12 and one of Chemistry 12, Biology 12, or Physics 12 and Chemistry 11 and one of Biology 11 or Physics 11. Biology 11 is strongly recommended.

Meeting the minimum academic requirements does not guarantee admission in the event that the number of applicants exceeds the number of available spaces.

### **3. Resources**

#### **3.1 Budget and Tuition Fees**

We have worked with Mr. Jeff Lei in the Provost's Office Strategic Decision Support to develop the budget for the proposed program and model a 10-year return for the program. Based on this model, the tuition revenue, with anticipated enrollment, will be sufficient to cover the incremental costs of providing the program and will generate net new resources for the Faculty of Forestry. In addition, as mentioned in Section 2.1, the proposed program development has the financial support from the Ministry of Advanced Education, Skills, and Training.

The tuition fees for the program will be the same as the fees for existing Faculty's B.Sc. programs in Forest Sciences, Natural Resources Conservation and Wood Products Processing, per the 2017/2018 academic year:

- Domestic students: \$172.99 per credit,
- International students: \$1,163.76 per credit

These figures lead to annual tuitions of approximately \$5300 for domestic students and \$35,700 for international students for a typical 30-credit course load.

We estimate that the annual enrolment in the program after the first two years of inception will be 25-30 students. We anticipate that 30% of the annual enrollment will be international and that half of the international enrollment will come from Chinese partner universities. The Faculty of Forestry will teach between 60-70% of the courses in the program, depending on elective selection. The remaining courses will be taught by the Faculty of Science (first year science courses), the Faculty of Arts, and the Sauder School of Business.

The Faculty of Forestry is able to absorb nearly all instruction of the 14 new courses based on strategic hires in the past few years, along with existing capacity across the Faculty. The Department of Wood Science hired one assistant professor January 2018 with expertise in biocomposites. The new President's Excellence Chair in Forest Bioproducts will teach one course in the program. Additionally, the Faculty of Forestry has an active search for an assistant or associate level professor, as a replacement hire for the Wood Science program that will teach two BEST courses. Because this position is a replacement hire in the Wood Products Processing program, it is not supported through the BEST program's budget. The remaining courses will be taught by professors within the Faculty of Forestry that currently have idle capacity in their teaching load. The remaining courses will be taught by the new instructor hired specifically for the BEST program to teach a minimum of three courses within the program.

Annual costs include:

- One new Instructor / Program Coordinator (salary approximately \$90,000, benefits \$13,000)
- One Sessional Lecturer (salary \$10,000/year)
- TA support for approximately 8 courses, at 92 hours per week for 16 weeks (\$47,870/year)

- Annual operational costs (space allocation, IT, marketing, and student support) (\$36,000/year)
- Laboratory expenses (consumables \$6,000/year)
- Honorarium for Program Director (\$5,000/year)

### **3.2 Human Resources**

The program structure will be similar to the Faculty's other B.Sc. programs in the first year. The second year includes five new program-specific courses to be taught by existing faculty in the Department of Wood Science.

The majority of the teaching of new courses will be done by existing faculty members and recently hired faculty members in the Department of Wood Science. Existing courses in the proposed program will also be taught by faculty in the Departments of Forest Resources Management and Forest and Conservation Sciences. Other new course needs will be delivered by sessional instructors. An existing faculty member will act as Program Director.

In addition, a program administrator will be hired to assist the program director with administrative requirements of the program.

### **3.3 Space**

Lectures and tutorials will be scheduled in existing classrooms and seminar rooms in the Forest Sciences Centre through Classroom Services. Laboratory courses will likewise be scheduled through Classroom Services in the Forest Sciences Centre. Existing research laboratories will be leveraged to prepare samples and materials.

### **3.4 Library**

The Forest Bioeconomy Sciences and Technology program will require new content for the specialized curriculum. In addition to library resources, the proposed program will utilize various online resources provided in the Faculty of Forestry. Other online resources are available through the Faculty of Applied Science.

### **3.5 Other Resources**

The UBC Point Grey campus is the home to several program resources. Many professors in the Faculty of Forestry are members in the BioProducts Institute research cluster (BPI). BPI's research advances and capital investments are assets to the proposed degree program. Associated facilities that span many faculties consist of state of the art research labs that include:

- Advanced Materials and Process Engineering Laboratory
- Bioenergy Research and Demonstration Facility
- Centre for Advanced Wood Processing

Additionally, the Faculty of Forestry works closely with FPInnovations, located on the Point Grey campus, as a resource for research and development and liaising with industry professionals.

## 4. Appendices

### 4.1 Curriculum Proposal Form: New Program

<b>Faculty:</b> Faculty of Forestry <b>Department:</b> Wood Science <b>Faculty Approval Date:</b> <b>Effective Session:</b> 2019W <b>Effective Academic Year:</b> 2019	<b>Date:</b> <b>Contact Person:</b> Scott Renneckar <b>Phone:</b> 604-827-7037 <b>Email:</b> scott.rennear@ubc.ca
<b>Proposed Calendar Entry:</b>  <u>Bachelor of Science in Forest Bioeconomy Sciences and Technology</u>  <b>Introduction</b> The B.Sc. in Bioeconomy Sciences and Technology (BEST) is an interdisciplinary program designed to prepare students for careers in the non-traditional forestry sector. The program provides students with a solid foundation in science and technology for innovative design and development of renewable materials and energy and sustainable land use strategies. Statistical methods, project management, communication skills, and approaches to public participation for bioeconomy planning and development are taught.  The curriculum leads to a Bachelor of Science in Forest Bioeconomy Sciences and Technology with the option to obtain a Minor in Commerce. The program consists of 95 core course credits, 9 restricted elective course credits, and 18 free non-restricted elective credits.  <b>Admission:</b> The Faculty will accept applications from students with varying educational preparation: (1) following graduation from secondary school or (2) post-secondary transfer students  Students entering from secondary school must have met the University entrance requirements and have completed Principles of Mathematics 12 or Pre-Calculus 12 and one of Chemistry 12, Biology 12, or Physics 12 and Chemistry 11	<b>URL:</b> N/A  <b>Current Calendar Entry:</b> None  <b>Type of Degree Action:</b> New Degree Program  <b>Rationale:</b>  The demand for jobs in the bioeconomy sector is growing. With Canada having the largest stock of woody and agricultural biomass internationally, the federal government is encouraging investment, both human and financial capital, into this emerging sector.  Currently, no other Canadian university provides a holistic education in Forest Bioeconomy Sciences and Technology --a program that integrates biological and chemical sciences with land use planning and management, economics and regulation, and conservation. The wealth of faculty expertise and facilities at UBC provides the ideal environment to initiate the proposed degree program.  The program aims to produce graduates with skills to obtain career-oriented employment in industry, research and development, government and non-government organizations.



and one of Biology 11 or Physics 11. Biology 11 is strongly recommended.

Meeting the minimum requirements does not guarantee admission in the event that the number of applicants exceeds the number of available spaces.

**Academic Regulations:**

See [Academic Regulations](#)

**Degree Requirements:**

**First Year**

BIOL 121	3
CHEM 121	4
CHEM 123	4
CONS 101	3
ECON 101	3
ENGL 112	3
GEOB 102 <sup>1</sup>	3
MATH 100, 102, or 104 <sup>2</sup>	3
SOCI 101 or 102 <sup>3</sup>	3
Electives	3
Total Credits	32

**Second Year**

BEST 200	3
BEST 201	3
BEST 202	3
BEST 203	3
BEST 204	3
CHEM 233	3
FRST 231	3
WOOD 225	3
Electives	6
Total Credits	30

**Third Year**

BEST 300	3
BEST 301	3
BEST 302	3
BEST 303	3
BEST 304	3
FRST 302	3
FRST 318	3

Restricted Social Science Elective <sup>4</sup>	3
Restricted Natural Resources Conservation Elective <sup>5</sup>	3
Electives	3
Total Credits	30
<b>Fourth Year</b>	
BEST 400	3
BEST 401	3
BEST 402	3
BEST 403	3
CONS 425	3
WOOD 461	3
WOOD 465	3
Restricted Commerce Elective <sup>6</sup>	3
Electives	6
Total Credits	30
<sup>1</sup> Students may take CONS 210 instead of GEOB 102 for credit <sup>2</sup> Students may take MATH 180 or 184 (4 credits) or MATH 110 (6 credits) instead of MATH 100, 102, or 104 (3 credits), but the credit difference cannot be applied towards program elective. <sup>3</sup> SOCI 101 or 102 are acceptable Sociology courses <sup>4</sup> One of the following 3-credit courses: GEOG 310, GEOG 318, GEOG 319, POLI 375, or SOCI 342 <sup>5</sup> One of the following 3-credit courses: CONS 200 or CONS 340 <sup>6</sup> One of the following 3-credit courses: COMM 329, COMM 457, or COMM 465	

<p><b>Faculty:</b> Faculty of Forestry  <b>Department:</b> Wood Science  <b>Faculty Approval Date:</b>  <b>Effective Session:</b> 2019W  <b>Effective Academic Year:</b> 2019</p>	<p><b>Date:</b>  <b>Contact Person:</b> Scott Rennekar  <b>Phone:</b> 604-827-7037  <b>Email:</b> <a href="mailto:scott.rennekar@ubc.ca">scott.rennekar@ubc.ca</a></p>
<p><b>Proposed Calendar Entry:</b></p> <p><u>Bachelor of Science in Forest Bioeconomy Sciences and Technology, <b>Minor in Commerce</b></u></p> <p><b>Admission:</b>  Enrolment in this program is limited. Students must have successfully completed one of MATH 100, 102, 104, 180, or 184 and both of ECON 101 and 102. Meeting the stated requirements does not guarantee admission to the program.</p> <p>The Commerce Minor is intended to be completed over two years.</p> <p><b>Minor in Commerce Requirements:</b>  The program consists of COMM 329, 457, 465, 473, 493; and one of COMM 398, or 458.</p>	<p><b>URL:</b> N/A</p> <p><b>Current Calendar Entry:</b> None</p> <p><b>Type of Degree Action:</b> Minor in Commerce</p> <p><b>Rationale:</b></p> <p>The Minor in Commerce will expose students to various business disciplines: accounting, finance, marketing, organizational behavior, and business strategy. Upon successful completion of this Minor program, the notation "Minor in Commerce" will appear on the student's transcript.</p>

## 4.2 Curriculum Proposal Form: New Course Code

<b>Faculty:</b> Faculty of Forestry <b>Department:</b> Wood Science <b>Faculty Approval Date:</b> 2019 <b>Effective Session:</b> 2019W	<b>Date:</b> <b>Contact Person:</b> Dr. Scott Rennekar <b>Phone:</b> 604-827-7037 <b>Email:</b> <a href="mailto:scott.rennekar@ubc.ca">scott.rennekar@ubc.ca</a>
<b>Proposed Calendar Entry:</b>  BEST- Forest Bioeconomy Sciences and Technology	<b>URL:</b> N/A  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New Course Code  <b>Rationale:</b> This new course code will be used to identify courses in which the primary focus will be characteristic of Forest Bioeconomy Sciences and Technology. These courses are being developed in support of the new degree program proposed in Forest Bioeconomy Sciences and Technology.  We believe that it is important to separate these new courses from other course codes in the Faculty of Forestry (CONS, FOPR, FRST, UFOR, and WOOD). Although they are a natural fit within the Faculty of Forestry, these new courses offer unique material. Thus, the separation with a new course code will highlight these course offerings to interested students outside of the Faculty of Forestry. With the exception of priority given to students in the new program, the proposed BEST courses will be open to students from outside of the Forest Bioeconomy Sciences and Technology program.

### 4.3 Curriculum Proposal Form: New Courses

<b>Faculty:</b> Faculty of Forestry <b>Department:</b> Wood Science <b>Faculty Approval Date:</b> <b>Faculty Academic Year:</b> 2019 <b>Effective Session:</b> 2019W	<b>Date:</b> <b>Contact Person:</b> Dr. Scott Rennecker <b>Phone:</b> 604-827-7037 <b>Email:</b> scott.rennecker@ubc.ca jack.saddler@ubc.ca
<b>Proposed Calendar Entry:</b>  <b>BEST 200 (3) Foundations in Bioproducts and the Bioeconomy</b> Introduction to the production, use, and attributes of renewable products and energy derived from biobased materials. Sustainability paradigms related to the bioeconomy; potential environmental and socio-political impacts associated with biobased technologies and transitions to sustainable economies. Prerequisite: CHEM 121 [3-0-0]  (See attachment Forestry-2019-1 for the proposed syllabus)	<b>URL:</b> N/A  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New Course  <b>Rationale:</b> This course is an introduction to the sustainable production and application of bioproducts developed from biological resources. The course is a required course in the proposed BEST program, but it may also be of broader interest to students across the university. The course will cover sustainability issues, comparison of Greenhouse Gas and Life Cycle Analysis models, and technical aspects of the processes and techniques used to convert biomass into a range of bioproducts including bioenergy, biofuels, biochemical, and biomaterials. Reference will be made to organizations that will provide both national and international perspectives on bioeconomy strategies. Examples from companies will indicate how the biorefinery sector is likely to develop.  <input type="checkbox"/> <b>Not available for Cr/D/F grading</b>

<p><b>Faculty:</b> Faculty of Forestry  <b>Department:</b> Wood Science  <b>Faculty Approval Date:</b>  <b>Faculty Academic Year:</b> 2019  <b>Effective Session:</b> 2019W</p>	<p><b>Date:</b>  <b>Contact Person:</b> Dr. Scott Rennekar  <b>Phone:</b> 604-827-7037  <b>Email:</b> scott.rennekar@ubc.ca  shawn.mansfield@ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 201 (3) Plants, Carbon, and Environment</b>  Introduction to plant biology, with special emphasis on growth and development, highlighting the biological mechanisms of radiation energy capture, and water and nutrient acquisition in the production of plant biomass.  Prerequisite: BIOL 111 or BIOL 121 [3-0-0]    (See attachment Forestry-2019-2 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  The course focuses on plants and their growing environment. The course will provide an introduction to biological processes that contribute to plant growth and development. It will focus on processes that help terrestrial, vascular plants to acquire and utilize environmental resources. Plant functions will be explored at various levels, ranging from the molecular to multi-species association.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 202 (3) Alternative Energy Systems</b>  Introduction to safe, clean, and sustainable supplies of energy. Economic, social, environmental, and policy issues raised by current systems of energy use and production are examined.  [3-0-0]</p> <p>(See attachment Forestry-2019-3 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  This course will introduce students to energy harvesting and conversion systems, energy delivery, and benefits and inefficiencies of different systems. The course will provide insight to energy consumption and geographical advantages and constraints of different systems, explain harvesting methods for passive and active thermal heating, analyze the efficiency of the conversion methods, and discuss policies that affect renewable energy adoption and costing of energy. Other topics covered will be efficiency, availability, and associated impacts of alternative energy systems.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 203 (3) Ecology of Managed Ecosystems</b>  Provides a foundation in managed ecosystems and community ecology. Includes material on forest ecology and agricultural ecosystems as managed environments.  Prerequisite: BIOL 111 or BIOL 121 [3-2-0]</p> <p>(See attachment Forestry-2019-4 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  This course will provide a foundation in managed ecosystems and community ecology. Terrestrial ecosystems are a key source of energy and materials that support human civilizations and are heavily managed for our uses. This course will introduce material on forest ecology and agricultural ecosystems as managed environments. This course will provide a broader understanding of many plant-based ecosystems, their components, influences, disturbance alterations and impacts, and classifications.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>



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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 204 (3) Land Use Management and Planning</b>  Global overview of land use management and planning, with a focus on principles and practice.  [3-0-2]</p> <p>(See attachment Forestry-2019-5 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  The goal of this course is to introduce students to the wide spectrum of land use issues occurring globally, as well as to tools used to plan and manage complex landscapes. This will position the student to better contextualize courses related to the production and use of bioproducts and bioenergy.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 300 (3) Biobased Polymers and Bioproducts</b>  Study of occurrence, synthesis, derivatization, physical properties, processing, and application of major bio-based polymers from biomass. Manufacturing processes and uses of biobased products are examined.  Prerequisites: CHEM 203 or CHEM 233 [3-0-0]</p> <p>(See attachment Forestry-2019-6 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  Polymeric materials play an essential role in our everyday life, in supporting our basic needs for food, clothing, transportation and housing. This course will equip students with fundamental knowledge on the existing primary bio-based polymeric materials. The course will introduce general aspects including how nature synthesizes these bio-based polymers, their physical and chemical properties, and biodegradability. In addition, fundamental polymer chemistry will be introduced to demonstrate how to derivatize natural polymers with tailored physical and chemical properties, as well as to synthesize biodegradable polymer from bio-based molecules. This course will continue to cover basic polymer processing techniques and the primary applications in our daily life.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 301 (3) Bioenergy</b>  Interdisciplinary approach to bioenergy. The technology of the systems involved, the social and environmental implications of biomass use for energy systems.  Prerequisites: BEST 202  [3-0-0]</p> <p>(See attachment Forestry-2019-7 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  Globally, people rely on biomass to meet their basic household energy needs. However, bio-energy has a significant role to play in sustainable energy futures. The challenge is that every energy conversion and technology comes with advantages and disadvantages and bio-energy is no exception. Concerns about land conversion from native forest to energy crop plantations, questions around the carbon impacts of bio-energy vs. fossil fuels, and the food vs. fuel debate have all influenced both public perception and policies around bio-energy. Navigating the transition to a sustainable world is humanity's current challenge. The degree to which bio-energy systems play a role and the impacts of that are the focus of this course. Students will approach the core problems, from a multi-disciplinary perspective (techno-economic, socio-political, and environmental). Students will utilize a suite of tools and ideas across disciplines to understand the technical underpinnings of bio-energy, its social and environmental implications and the role of policy and economics in bio-energy futures.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 302 (3) Laboratory in Bioeconomy Technology (I)</b>  Laboratory modules for bioeconomy technologies; bioenergy and bioproducts.  Prerequisite: BEST 200  Co-requisites: BEST 300 [1-3-0]</p> <p>(See attachment Forestry-2019-8 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  This course will provide students with hands-on practice analyzing theory and showing how biomass can be transformed into useful and innovative products in biomaterials and bioenergy. Students will analyze sources of variations in biomass and impact on conversion into bioproducts; select appropriate methodologies for biomass analysis based on required use; demonstrate knowledge of traditional bioenergy benefits and hazards; prepare cellulose nanocrystals and describe processing requirements to create materials; devise 3-D printed biopolymer objects and recommend conditions for optimal performance in-use.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 303 (3) Applied Biotechnology for Bioproducts</b>          Use of microbiology and enzymology for processing and enhancing value of forest and agro-based bioproducts; saccharification of biomass, fermentation, and product upgrading with biocatalysts.          Prerequisites: BEST 300          [3-0-0]</p> <p>(See attachment Forestry-2019-9 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>          Biotechnology is a key component in the transformation of biomass that includes conversion into chemicals, tailoring of fibre properties, and creation of new biobased materials. The utilization, benefits and constraints of enzymes and micro-organisms for transformation in industrial scenarios will be highlighted in order for students to have a theoretical framework for working with biotechnology in the forest products industry.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 304 (3) Laboratory in Bioeconomy Technology (II)</b>  Laboratory modules for bioeconomy technologies; plant breeding, deconstruction, fermentation, and applied biotechnology.  Prerequisites: BEST 302  Co-requisite: BEST 303  [1-3-0]</p> <p>(See attachment Forestry-2019-10 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  This course will provide understanding into the applied biotechnology for the production of useful chemicals from plant based sources. Students will be able to describe constraints to biological transformation along with the potential to form innovative chemicals.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

<b>Faculty:</b> Faculty of Forestry <b>Department:</b> Wood Science <b>Faculty Approval Date:</b> <b>Faculty Academic Year:</b> 2019 <b>Effective Session:</b> 2019W	<b>Date:</b> <b>Contact Person:</b> Dr. Scott Rennekar <b>Phone:</b> 604-827-7037 <b>Email:</b> scott.rennekar@ubc.ca
<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 400 (3) Biomimicry and Biocomposites</b>          Introduction to principles of self-assembly, hierarchical structures, biocomposites, and unique adaptive structures.          Prerequisites: BEST 300 [3-0-0]</p> <p>(See attachment Forestry-2019-11 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>          Materials that are lightweight, tough and mechanically resilient are found throughout nature. These materials are created under ambient conditions with reactants that are non-toxic and can be recycled at the end of their life. Adopting these nature-inspired designs and synthesis principles is the foundation of biomimicry. This course will offer students insight into the principles of structure-property relationships to describe the behaviour of natural materials. Students will be provided with the applied chemistry and physics background to discuss technical aspects of material design, natural material life cycles with impact on carbon, silica, and nitrogen fixation, and how natural materials have created solutions for highly interesting properties such as superhydrophobic surfaces, structural colour, and stimuli responsive materials. The course will emphasize how biological diversity in the natural world provides an unparalleled resource to learn design clues for motifs for the efficient partitioning of limited resources to meet unique material functionality.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 401 (3) Carbon and Energy Economics</b>  Understanding key issues for carbon management, protocols for carbon accounting and methodologies for emissions inventories and carbon costing. Economics and business response to climate change are examined.  Prerequisite: ECON 101  [3-0-0]</p> <p>(See attachment Forestry-2019-12 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  This course will provide insight into the carbon economy covering aspects of carbon and emission accounting using industry standard models. Students will be able to exam carbon economics through the lens of economic theory along with insight into carbon finance such as cap and trade and carbon tax approaches.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>



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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 402 (3) Industrial Ecology</b>  Concepts in sustainability around technology and material use; relevance of biological ecology to industrial ecology; life cycle analysis: components and applications; and approaches to design.  Prerequisite: BEST 200 [3-0-2]</p> <p>(See attachment Forestry-2019-13 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  Students will gain an introduction to systems analysis in order to understand how human activities such as energy and materials consumption, waste generation and pollutants can be managed and tracked through material and energy flow analysis.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

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<p><b>Proposed Calendar Entry:</b></p> <p><b>BEST 403 (3) Integrated Strategies for Bioproduct Innovation</b>  Project-based course on development of bioeconomy products; demonstration of out-of-box thinking, service learning and teamwork.</p> <p>Restricted to students in the Forest Bioeconomy Sciences and Technology program.  [2-3-0]</p> <p>(See attachment Forestry-2019-14 for the proposed syllabus)</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale:</b>  Students will integrate previous course curriculum to develop a novel material for a defined problem providing the students opportunity for developing project management experience. The course will highlight ways that design merges aesthetic and functional attributes utilizing new biobased materials and manufacturing in order to understand innovation in product development.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>

## Attachment Forestry-2019-1

### **BEST 200, Foundations in Bioproducts and the Bioeconomy** 3 Credits

**Calendar Description:** Conceptual foundations of bioeconomy; biorefineries; socio-, enviro-, and economic perspectives of sustainability of bioproducts and bioenergy.

**Instructor:** J. Saddler

**Lecture time / location** – three, one hour lectures per week

**Office Hours:** TBA

**Prerequisites:** CHEM 121

**Course goals:** This course will introduce the sustainable production and application of bioproducts developed from biological resources. Students will develop an appreciation of the major sources of biomass that would be available (with an emphasis on forest derived biomass), and the processes and techniques used to convert biomass into a range of bioproducts including bioenergy, biofuels, biochemical, biomaterials, etc. As well as technical aspects, the course will cover sustainability issues, comparison of Greenhouse Gas and Life Cycle analysis (LCA) models. Reference will be made to international and national organizations such as the International Energy Agency (IEA), International Renewable Energy Agency (IRENA), the UN's Food and Agriculture Organization (FAO), US Dept. of Energy, European Union's Horizon 2020, program, etc., to provide both a national and international perspective on bioeconomy strategies. Examples from companies such as Borregaard, UPM, Neste, DSM-POET, Novozymes, Fibria and BASF, will indicated how the biorefinery sector is likely to develop.

**Learning objectives:** Upon completion of this course, the students will have derived a better understanding of what might constitute the global bioeconomy and why it will likely complement the fossil fuel based economy over the short-to-midterm timeframe.

- Summarize current agriculture and forest sectors role at the forefront of developing the future bioeconomy.
- Differentiate current traditional products such as food, feed, fiber and fuels (charcoal/fuel wood), lumber, composites, pulp and paper from non-traditional bioproducts such as biodegradable plastics, biofuels and biochemical.
- Explain both thermochemical (pyrolysis, gasification, Hydrothermal Liquefaction (HTL)) and biochemical approaches to biorefining.
- Evaluate the principles of a biorefinery approach to replacing fossil derived materials.
- Propose the various technologies used to convert biomass to valuable bioproducts,
- Debate economic and environmental benefits of bioeconomy.

### **Required Texts:**

Bioproducts from Canada's Forests. Suzanne Wetzel, Luc C. Duchesne, Michael F. Laporte, 2006.

**Recommended Texts:**

1. A sustainable bioeconomy: the green industrial revolution. Mika Sillanpaa, Chaker Neibi.
2. The “Biorefinery Fact Sheet” and its Application to Wood Based Biorefining – Case Studies of IEA Bioenergy Task 42 “Biorefining”
3. Proteins for Food, Feed and Biobased Applications: Biorefining of protein containing biomass IEA Bioenergy Task 42
4. The “The potential and challenges of drop-in biofuels”, IEA Bioenergy Task 39
5. Towards sustainable bioeconomy guidelines, FAO report (<http://www.fao.org/partnerships/resource-partners/investing-for-results/news-article/en/c/1030137/>)

**Course website:** Course website will be available that students are expected to use it for checking grades and obtaining lecture materials.

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Description of current, global, Oil-based economy	<ul style="list-style-type: none"> <li>Worldwide production, consumption, oil-based products, environmental impacts. Oil and Chemical companies. Role of organizations such as OPEC, IEA, IRENA. Growth of “unconventional” oil (Oil sands, fracking, shale revolution, etc.)</li> </ul>	Readings and discussions
Description of the current and possible future Bioeconomy sector	<ul style="list-style-type: none"> <li>Traditional uses of agriculture and forest based biomass, from charcoal and cookpots to composites, nanocrystalline cellulose through to drop-in biofuels. Why companies such as UPM, Borregaard, Coca-Cola, BASF, etc., are investing in this area.</li> </ul>	Readings and discussions
Agriculture based biorefineries	<ul style="list-style-type: none"> <li>The agriculture sector and how they are they are developing a food, feed, fiber, fuel and bioproducts (nutraceuticals through to composites) approach to value added</li> </ul>	Readings and discussion
Forest based biorefineries	<ul style="list-style-type: none"> <li>The forest sector and how they are developing a solid/composite wood, pulp and paper, biochemical and energy approach to developing the biorefinery</li> </ul>	Readings and discussion
Sources of feedstock such as wastes (MSW, Sewage sludge) sugar, starch, lipids, and biomass	<p>Likely sources of feedstock, types of wastes, there location and value, starch, proteins, lipids, chitin, chitosan, biomass (Cellulose, hemicellulose, lignin,). Assessing volume versus value. Examples of where different feedstocks are currently used in biorefinery applications</p>	Readings and discussion

Bioenergy	Comparison of developing and developed world uses of bioenergy. Examples of Finland and Sweden where bioenergy already constitutes more than 30% of each country's total energy production and use. Different routes to bioenergy, from combustion through to advanced thermochemical	Readings and discussion Multimedia video on bioenergy
Advanced Bioenergy	Description of bioenergy use at residential, municipal and regional levels and technologies such as combined heat and power, through to pellet boilers	Readings and discussion Tour of Bioenergy Research and Demonstration Facility
Conventional Biofuels	Production of Bioethanol from sugar and starch highlighting the Brazilian and US approaches, technical, economic and policy considerations	Readings/ case study
Conventional Biofuels	Production of Biodiesel from vegetables and animal lipids. Sources such as Canola, Palm, Used Cooking Oil (UCO), Tall Oil, etc. Similarities and differences of products such as FAME, HEFA, HVO. Cost, availability, sustainability and differences in Feedstocks	Readings/ case study
Conventional Biofuels/biogas	Growth in LNG use and ability of RNG to "green up" the use of "natural gas". Anaerobic production of methane, landfill gas, wastewater treatment, gas clean up. Commercial production and use of "renewable gas"	Readings/ case study
Advanced biofuels	Cellulosic ethanol. Pretreatment, enzyme hydrolysis, fermentation, ethanol/butanol, need for co-product value (lignin/hemicellulose). Commercial successes and failures	Readings/ tour of Process Development Unit
Advanced Biofuels	Drop-in biofuels. Their production via various thermochemical and biochemical routes. Pyrolysis, gasification and HTL routes to drop in production. Need for upgrading and refinery integration	Readings and discussion
Biochemicals from sugars, starch, lignin, biomass and extractives	Commercial examples such as BioAmber, Avantium, etc., and the production of Fine chemicals such as Glycolic, 3-Hydroxypropionic, succinic, levulinic, lactic acids. Pathways, value, current and future markets	News highlights
Nutraceuticals	Traditional (i.e., Salicylic acid) and	Readings and discussion

from sugars, starch, lignin, biomass and extractives	novel (taxol) Pharmaceuticals and bioactive materials,	
Biomaterials	Traditional Pulp and paper Kraft, Mechanical, Dissolving pulp, etc. Process description, chemistry, products, markets, value	Readings and discussion
	Novel/evolving products and markets. Nanocrystalline cellulose, nanofibrillated cellulose, etc., production, properties and markets	
	Bioplastics Carbohydrate-based/derived bioplastics Micro-organisms	
Biorefineries	Current Facilities (Borregaard, UPM, Alt Air) Comparison with petroleum refineries	Readings and discussion
	The volume (i.e., biofuels) versus value (i.e. nutraceuticals) dilemma. Using examples from sectors (agriculture) and processes (algae). Current major biorefineries plants, and the primary products	
Sustainability and Life Cycle Analysis (LCA)	Description of current bodies that monitor sustainability. (i.e SFI, FSC, SBP, RSB, etc.) and the criteria used to try to ensure sustainability (three legs of the economic, social and environmental “stool”)	Readings and discussion
	Overview of Life Cycle Analysis (LCA), from the work of Athena in building construction and use through to biofuels LCA models such as GREET, GHGenius, BioGrace and SimaPro.	Guest lecture
Policy considerations	It is likely that fossil derived products from the current oil and chemical sectors will be cheaper to produce than for biorefineries. Thus, policies such as Carbon tax, LCFS, RIN’s etc., will be described, to show how this price gap can be bridged in the short-to-mid term	Readings and discussion
Capstone lecture on the forest based	Review of companies and countries that will likely lead the development of the bioeconomy and how the current OECD	Class presentations

biorefinery	company lead approach will be superseded by non-OECD countries that have the feedstock and the markets,	
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**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:**

Mid-term exam

30%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

Quizzes

20%

Quizzes covering individual topics will be given after the completion of each topic to assess students' understanding of course material prior to moving on to the next topic. Quizzes will be approximately 15 minutes in length and students will be notified in advance of the quiz dates.

In-class participation / activities

10%

Students are expected to participate in class discussion and activities. Students will be graded based on their contribution to class discussions and completion of periodic in-class activities. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

Final lecture exam

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

## Attachment Forestry-2019-2

### **BEST 201, Plants, Carbon, and the Environment** 3 Credits

**Catalogue Description:** BEST 201 (3) *Plants, Carbon, and the Environment*. An introduction to plant biology, with special emphasis on growth and development, highlighting the biological mechanisms of radiation energy capture, and water and nutrient acquisition in the production of plant biomass.

**Instructor:** TBA

**Lecture time / location** – three, one hour lectures per week

**Office Hours:** TBA

**Prerequisites:** BIOL 111 or BIOL 121

**Course goals:** The course focuses on plant and their growing environment. The course will provide an introduction to biological processes that contribute to plant growth and development. It will focus on processes that help terrestrial, vascular plants to acquire and utilize environmental resources.

The biological process that underlie routine metabolism are crucially important for growth, survival and reproduction of plants, and contribute significantly to the overall performance of vegetation in natural and managed ecosystems. Plant functions will be explored at various levels, ranging from the molecular to the multi-species association.

**Learning objectives:** Upon completion of this course, students will have a foundation in fundamental plant biological processes and how interactions with their growing environment influences plant growth, development, and survivability. Students will be able to describe the sequence of events that takes place during the assimilation of carbon, and understand the principles of carbon allocation and partitioning. The student will ultimately have the knowledge of basic plant function, and be able to use this information to interpret and predict plant performance. Individual, specific learning outcomes will be specified for each general topic area. Learning outcomes are important as the targets of both instruction and examination.

**Required Texts:** Plant Biology. A.M. Smith, G. Coupland, L. Dolan, N. Harberd, J. Jones, C. Martin, Robert Sablowski, and A. Amey. Garland Science, Taylor and Francis, 2009.

**Recommended Texts:** Structure and Function of Plants. J.W. MacAdam. Wiley-Blackwell, 2009

**Course website:** TBA

#### **Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Land Plants	<ul style="list-style-type: none"> <li>• Eukaryotic cells</li> <li>• Genes, genomes and genetic regulation</li> <li>• Land Plant</li> <li>• Seed plants</li> <li>• Angiosperms</li> </ul>	



Cells and Tissues	<ul style="list-style-type: none"> <li>• Cell division</li> <li>• Organelles</li> <li>• Cell expansion and shape</li> <li>• Primary cell wall</li> <li>• Secondary cell wall</li> <li>• Specialty cells and tissues</li> </ul>	
Metabolism	<ul style="list-style-type: none"> <li>• Metabolic pathways</li> <li>• Photosynthesis</li> <li>• Photorespiration</li> <li>• Carbon assimilation</li> <li>• Sucrose transport</li> <li>• The transpirational stream (water movement)</li> <li>• Starch metabolism (carbon storage)</li> <li>• Non-photosynthetic generation of energy</li> <li>• Nutrient acquisition</li> <li>• Nitrogen assimilation</li> <li>• Phosphorus and Sulfur assimilation</li> </ul>	
Development	<ul style="list-style-type: none"> <li>• Plant development</li> <li>• Seed development</li> <li>• Root development</li> <li>• Shoot development</li> <li>• Transition from vegetative to reproductive growth</li> </ul>	
Domestication and Agriculture	<ul style="list-style-type: none"> <li>• Domestication</li> <li>• Plant breeding</li> <li>• Biotechnology</li> </ul>	

### **Expectations for student writing:**

All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content. Proper citation according to course guidelines of materials derived from other sources is mandatory. All wording should be the student's OWN and not that of another author.

As per UBC policies, make-up tests, quizzes, or assignments will only be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

### **Evaluation of student learning:**

#### **Lecture mid-term**

25%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

Lab / lecture reports / term paper

25%

Students will prepare a lab report for each topic module. The student lab reports will be marked separately from lab participation.

In-class participation / activities

10%

Students are expected to participate in class discussion and activities. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

Final lecture exam

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

## Attachment Forestry-2019-3

### **BEST 202 Alternative Energy Systems** 3 Credits

**Catalogue Description:** Introduction to safe, clean, and sustainable supplies of energy. Description of energy production from direct solar energy, bioenergy, liquid biofuels, hydro and tidal, wind, and geothermal. Economic, social, environmental, and policy issues raised by current systems of energy use and production.

**Instructor:** TBA

**Lecture time / location** – three, one hour lectures per week

**Office Hours:** TBA

**Prerequisites:** None

**Course goals:** The goal of this course is to introduce students to energy harvesting and conversion systems, energy delivery, and benefits and inefficiencies of different systems. The course will provide insight to energy consumption and geographical advantages and constraints of different systems.

**Learning objectives:**

- Define energy and power and compute conversion and efficiency
- Discuss the nature and availability of solar radiation from spatial and temporal perspectives
- Explain harvesting methods for passive and active solar thermal heating
- Demonstrate knowledge of principles of solar photovoltaics and environmental impact and safety
- Analyze the efficiency of the conversion methods of biomass into bioenergy and liquid biofuels
- Explain energy generation from turbines, wind and hydro, and associated impact of energy harvesting
- Debate policies that impact renewable energy adoption and costing of energy

**Required Texts:**

Renewable Energy. Power for a Sustainable Future, Godfrey Boyle, Oxford University Press, 3rd Edition. 2012.

**Recommended Texts:**

Energy Systems and Sustainability, Godfrey Boyle, Bob Everett, and Janet Ramage, Oxford University Press, 2003.

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Introduction (1 week)	<ul style="list-style-type: none"> <li>• Force, energy and power</li> <li>• Energy conservation</li> </ul>	Readings and problem set

	<ul style="list-style-type: none"> <li>• Forms of energy</li> </ul>	
Solar thermal energy (2 weeks)	<ul style="list-style-type: none"> <li>• Availability of solar radiation</li> <li>• Tilt and orientation</li> <li>• Low temperature solar applications</li> <li>• Active and passive solar heating</li> <li>• Solar thermal engines</li> </ul>	Readings and discussion Home lab activity
Solar photovoltaics (1 week)	<ul style="list-style-type: none"> <li>• PV in silicon</li> <li>• Thin film PV</li> <li>• Grid connected PVs</li> <li>• PV production cost, environmental impact and safety</li> </ul>	Readings and demonstration
Bioenergy and liquid fuels from biomass (3 weeks)	<ul style="list-style-type: none"> <li>• Biomass as a fuel</li> <li>• Variability of biomass and moisture</li> <li>• Combustion of solid biomass</li> <li>• Production of liquid fuels</li> <li>• Environmental impacts</li> </ul>	Readings and discussion In-class activity
Hydroelectricity and tidal power (2 weeks)	<ul style="list-style-type: none"> <li>• Stored potential energy</li> <li>• Types of hydroelectric plants</li> <li>• Francis turbine and impulse turbines</li> <li>• Tidal current turbine</li> <li>• Environmental considerations</li> </ul>	Readings and discussion Case study
Wind energy (1 week)	<ul style="list-style-type: none"> <li>• Wind turbine types and aerodynamics</li> <li>• Production rates of wind turbine energy</li> <li>• Estimating wind speed</li> <li>• Environmental impact and public attitudes</li> </ul>	Readings and discussion
Other technologies (1 week)	<ul style="list-style-type: none"> <li>• Wave energy</li> <li>• Geothermal energy</li> <li>• Energy harvesting</li> </ul>	Readings and discussion Group presentations
Future of energy (1 week)	<ul style="list-style-type: none"> <li>• Sustainable development and urbanization</li> <li>• Pragmatism and economic/environmental consideration</li> </ul>	Readings and discussion

### **Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:****Lecture mid-term**

30%

Students will be examined on basic concepts learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

**Quizzes**

20%

Short assessments of student progress will be given in the form of a quiz covering individual topics. These quizzes will be given after the completion of each topic to assess students' understanding of course material prior to moving on to the next topic. Quizzes will be approximately 15 minutes in length and students will be notified in advance of the quiz dates.

**In-class participation / activities**

10%

Students are expected to participate in class discussion and activities. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

**Final lecture exam**

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

## Attachment Forestry-2019-4

### **BEST 203, Ecology of Managed Ecosystems** 3 credits

**Catalogue Description:** Provides a foundation in managed ecosystems and community ecology. Includes material on forest ecology and agricultural ecosystems as managed environments.

**Instructor:** TBA

**Lecture time / location** – three, one hour lectures per week

**Tutorial times / locations** – one, two hour lab per week

**Office Hours:** TBA

**Prerequisites:** BIOL 111 or BIOL 121

**Course goals:** Terrestrial ecosystems are a key source of energy and materials that support human civilizations and are heavily managed for our uses. Through better understanding of how these complex adaptive ecosystems and their relationships to human activities, we can reduce the impacts of our resource extractions while meeting a diverse set of human needs. This course will examine the ecology of managed ecosystems that are of global importance to food, energy, and other resources that humans rely upon for survival. The importance of disturbance ecology, ecosystem interactions, and biodiversity will be the main themes of study.

**Learning objectives:**

Through this course, successful students will:

- Identify and describe global ecosystems of specific importance to resource and energy production
- Describe and apply ecosystem classification techniques, contrast among approaches for ecosystem classification
- Summarize and describe ecosystem components and their interactions, including regulating factors and emergent properties
- Explain how disturbances alter ecosystem productivity and pathways
- Explain how ecosystems are complex and adaptive systems
- Relate nutrient, energy, and water cycling in productive systems to their functioning
- Describe primary and secondary ecosystem succession
- Define biological diversity (alpha, beta, gamma) with relevance to ecosystem functions and drivers

**Course Resources:**

Levetin and McMahon (2006) 2015. Plants and Society

Chapin et al. 2003 Principles of terrestrial ecosystem ecology. Springer, New York (available for free online)

Online materials: This course will have a Canvas online site for the dissemination of some course materials, posting of quizzes, and other interactions with topics and discussions. Course materials posted to the online system are not intended to be comprehensive, nor sufficient to replace class attendance. Students must attend all lectures and tutorials in order to succeed in this course.

**Evaluation of student learning:****Lecture mid-term**

30%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

**Lab / lecture reports**

25%

Lab work will compliment material covered during weekly lectures. Students will work in pairs or groups to apply classroom theory to practical problems addressing complex adaptive ecosystems and their relationships to human activities. Students will prepare a lab report for each topic module. The student lab reports will be marked separately from lab participation.

**In-class participation**

10%

Students are expected to participate in class discussion and lab work. Students will be graded based on their contribution to discussion in both the lecture and lab components of the course. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

**Final exam**

35%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.** Students will be required to use Turnitin.com for some written assignments, to check for plagiarism in wording and content. Please consult UBC's policy on plagiarism for more detail.

As per UBC policies, make-up tests, quizzes, or assignments are **only** permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Course Schedule (organized by modules):**

*Each module would be ~2 weeks long, with at least one lab and small assignment tied to the labs.*

Topic	Potential lectures	Tutorial / Lab activity
Introduction to course scope and content	<ul style="list-style-type: none"> <li>• Productive ecosystems and societies</li> <li>• Ecosystem services and goods</li> <li>• Ecosystems and human health</li> </ul>	discussion-oriented lab
Nutrient and energy cycling	<ul style="list-style-type: none"> <li>• Primary productivity and carbon cycling</li> <li>• Energy (light) capture and cycling</li> <li>• Nitrogen and phosphorous cycling</li> <li>• Soil development and ecology</li> </ul>	Measurement of light intensity and quality in campus ecosystems Soils tour of campus
Disturbance	<ul style="list-style-type: none"> <li>• Primary and secondary succession</li> </ul>	Succession exercise + associated

ecology	<ul style="list-style-type: none"> <li>• Abiotic and biotic disturbances</li> <li>• Introduced species and novel ecosystems</li> </ul>	questions
Ecosystem interactions	<ul style="list-style-type: none"> <li>• Ecosystem components, interactions, and structures (e.g. niche)</li> <li>• Emergent properties of ecosystems</li> <li>• Cross-boundary ecosystem interactions (e.g. aquatic-terrestrial)</li> </ul>	Predator-prey model (Computer skills competency) + associated questions Potential case studies: 'Billion ton report 2016' <sup>1</sup> and 'global tree count' <sup>2</sup>
Biodiversity	<ul style="list-style-type: none"> <li>• Alpha, beta, and gamma diversity measures</li> <li>• Diversity and ecosystem resilience</li> <li>• Productivity and diversity</li> </ul>	Computer lab to calculate diversity indices (basic spreadsheet / data summary competency)
Ecosystem classification systems	<ul style="list-style-type: none"> <li>• Methods of classifying ecosystems</li> <li>• Biogeoclimatic zone classification</li> <li>• Measurements of forest ecosystems</li> <li>• Classification of ecosystems across varying scales</li> </ul>	Measurement and classification of ecosystems (data summarization / report writing competency)

Note: reserve one week for midterm exam + review

<sup>1</sup> [https://energy.gov/sites/prod/files/2016/12/f34/2016\\_billion\\_ton\\_report\\_12.2.16\\_0.pdf](https://energy.gov/sites/prod/files/2016/12/f34/2016_billion_ton_report_12.2.16_0.pdf) <sup>2</sup> Nature doi:10.1038/nature.2015.1828



## Attachment Forestry-2019-5

### **BEST 204, Land Use Management and Planning** 3 Credits

**Catalogue Description:** Global overview of land use management and planning, with a focus on principles and practice.

**Instructor:** TBA

**Lecture time / location** – three 1-hour lectures per week + one 2-hour tutorial: TBA

**Office Hours:** TBA

**Prerequisites:** None

**Course goals:** The goal of this course is to introduce students to the wide spectrum of land use issues occurring globally, as well as to tools used to plan and manage complex landscapes. This will position the student to better contextualize courses related to the production and use of bioproducts and bioenergy.

**Learning objectives:**

At the end of the course, the student will be able to:

- Situate land-use within an historical context, and recognize near- and long-term trends and be conversant on land-use issues from both western and Indigenous perspectives.
- Describe a variety of real-world land use problems, with an appreciation of their complexities, interactions, and nuances.
- Apply a variety of planning tools to land use management problems to make informed decisions at multiple scales.
- Evaluate a number of land-use initiatives through a variety of environmental perspectives and theoretical lenses.
- Inform the development of a land-use planning initiative that meets both socio-economic and environmental needs.
- Speak confidently about human-environment interactions, with a focus on community wellbeing.
- Appraise wicked environmental land-use problems in an integrative, holistic and critical manner.

**Required Texts:** Randolph, John (2011). *Environmental Land Use Planning and Management*, 2<sup>nd</sup> Edition. Island Press.

**Recommended Texts:** One or two topically relevant readings will be assigned on a weekly basis for discussion in the 2-hour tutorials.

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Introduction (1 weeks)	<ul style="list-style-type: none"> <li>• Global environmental issues</li> <li>• Sustainability</li> <li>• Climate change</li> <li>• Food security, biofuels</li> </ul>	Readings & Discussion
Land Use (4 weeks)	<ul style="list-style-type: none"> <li>• Indigenous perspectives on land use</li> <li>• Soils, topography</li> <li>• Forestry</li> <li>• Agriculture</li> <li>• Watersheds, groundwater</li> <li>• Natural hazards</li> <li>• Wildlife, biodiversity</li> <li>• Urbanization</li> </ul>	Readings & Discussion
Environmental Planning (4 weeks)	<ul style="list-style-type: none"> <li>• Theory and process</li> <li>• Temporal and spatial scales</li> <li>• Planning tools, remote sensing</li> <li>• Policy</li> </ul>	Readings & Discussion
Systems Thinking (2 weeks)	<ul style="list-style-type: none"> <li>• Human-environment interactions</li> <li>• Community wellbeing</li> <li>• Socio-ecological systems</li> <li>• Integrative landscape management</li> <li>• Landscapes and communities</li> </ul>	Readings & Discussion

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:****Lecture mid-term**

25%

Students will be examined on basic concepts learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

Term paper

25%

Students will write a term paper about a chosen topic covered in the course. The paper should include an introduction, main argument, and conclusion. It should be no longer than 20 pages (font 12, 1.5 spaced including references). The main criteria for grading this assignment will be the logical organization of the paper, demonstration of knowledge of the chosen topic, clarity of analysis of the topic, correct use of references, and a well-developed conclusion.

In-class participation / activities

10%

Students are expected to participate in class discussion and activities. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

Final lecture exam

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

## Attachment Forestry-2019-6

### **BEST 300, Biobased Polymers and Bioproducts** 3 Credits

**Catalogue Description:** Occurrence, synthesis, physical properties, processing, and application of major biobased polymers from biomass. Focus on current available products and potential new product development and commercialization in the bioeconomy.

**Instructor:** Dr. Emily Cranston; Dr. Feng Jiang, FSC 4038, 604-822-7667; [feng.jiang@ubc.ca](mailto:feng.jiang@ubc.ca)

**Lecture time / location** – three, one hour lectures per week

**Office Hours:** TBA

**Prerequisites:** CHEM 233 or CHEM 203

**Course goals:** Polymeric materials have played an essential role in our everyday life, in supporting our basic needs for food, clothing, transportation and housing. Before the introduction of petroleum-based synthetic polymers, people have been utilizing natural polymers synthesized by living organisms for thousands of years. With continuing efforts in transforming petro-economy back into a bioeconomy, biobased polymeric materials have once again received worldwide attention. It is therefore crucial to foster knowledge development of biobased polymeric materials for future generations. This course is designed to equip students with fundamental knowledge on the existing primary biobased polymeric materials. The course will start to introduce general aspects including how nature synthesizes these bio-based polymers, their physical and chemical properties, and biodegradability. This course will cover transformations of biobased polymers for industrial polymer processing techniques and highlight the primary applications of nature derived polymers in our daily life and the potential for use in new applications based on polymer structure property relationships.

**Learning objectives:** Upon completion of this course, successful students will be able to:

- Identify the primary bio-based polymeric materials existing in everyday life;
- Interpret the relationships between chemical structures and physical properties of bio-based polymers;
- Differentiate bio-based polymers from synthetic ones;
- Explain bio-based polymers synthesis;
- Describe chemical reactions to modify and/or synthesize new biopolymers with targeted properties and functionalities;

### **Recommended Texts:**

1. Polysaccharides: Structural Diversity and Functional Versatility, 2<sup>nd</sup> Edition. Severian Dumitriu
2. Polysaccharides I: Structure, Characterization and Use. Thomas Heinze
3. Polysaccharides II. Dieter Klemm.
4. Essentials of Carbohydrate Chemistry. John F. Robyt, Springer, 1998.
5. Methods in Lignin Chemistry. Stephen Y. Lin. Carlton W. Dence

6. Wood: Chemistry, Ultrastructure, Reactions. Dietrich Fengel, Gerd Wegener.
7. Chemistry of Natural Protein Fibers. R.S. Asquith.
8. Handbook of Biopolymers and Biodegradable Plastics - Properties, Processing and Applications. Sina Ebnesajjad.
9. Polylactic Acid - PLA Biopolymer Technology and Applications. Sin, Lee Tin
10. Biopolymers. A. Steinbuechel, M. Hofrichter.

**Course website:** Course website will be available that students are expected to use it for checking grades and obtaining lecture materials.

**Course Schedule (organized by modules):**

Topic	Potential lectures
Introduction of polymeric materials (Week 1)	<ul style="list-style-type: none"> <li>• Introduction to biomaterials               <ul style="list-style-type: none"> <li>– Origin, occurrence, classification</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Introduction to polymer chemistry               <ul style="list-style-type: none"> <li>– Definition, molecular weight, repeating unit</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Examples of synthetic polymers and principles of polymerization               <ul style="list-style-type: none"> <li>– Step-growth polymerization, chain-growth polymerization</li> </ul> </li> </ul>
Polysaccharides chemistry (Week 2)	<ul style="list-style-type: none"> <li>• Polysaccharide chemistry               <ul style="list-style-type: none"> <li>– History, origin, occurrence, structure</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Review nomenclature               <ul style="list-style-type: none"> <li>– Monosaccharides</li> <li>– Oligosaccharides &amp; polysaccharides, depiction, linkages and substitution</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Cellulose chemistry               <ul style="list-style-type: none"> <li>– Occurrence, molecular structure, supramolecular structure, crystalline structure, physical properties, dissolution</li> </ul> </li> </ul>
(Week 3)	<ul style="list-style-type: none"> <li>• Cellulose chemistry               <ul style="list-style-type: none"> <li>– Esterification</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Cellulose chemistry               <ul style="list-style-type: none"> <li>– Etherification</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Cellulose processing               <ul style="list-style-type: none"> <li>– Fibers spinning, films casting, commercial application</li> </ul> </li> </ul>
(Week 4)	<ul style="list-style-type: none"> <li>• Chitin               <ul style="list-style-type: none"> <li>– Occurrence, molecular structure, supramolecular structure, crystalline structure, physical properties, dissolution</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Chitin chemistry               <ul style="list-style-type: none"> <li>– Chitosan, esterification</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Chitin processing               <ul style="list-style-type: none"> <li>– Fibers spinning, films casting, commercial application</li> </ul> </li> </ul>
(Week 5)	<ul style="list-style-type: none"> <li>• Starch chemistry               <ul style="list-style-type: none"> <li>– Amylose, amylopectin, chemical structure, dissolution, physical properties</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Starch chemistry               <ul style="list-style-type: none"> <li>– Esterification, modification, biodegradability, processing</li> </ul> </li> </ul>
(Week 6)	<ul style="list-style-type: none"> <li>• Hemicellulose               <ul style="list-style-type: none"> <li>– Nature and classification</li> <li>– Primary structure</li> <li>– Xylan, Xyloglucan, Mannans</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Hemicellulose <ul style="list-style-type: none"> <li>– Modification, processing, modification, applications</li> </ul> </li> </ul>
(Week 7)	<ul style="list-style-type: none"> <li>• Alginate chemistry <ul style="list-style-type: none"> <li>– Chemical structure, monomers, chemical modification, biodegradation, processing</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Glycogen <ul style="list-style-type: none"> <li>– Structure, functions</li> </ul> </li> </ul>
Lignin chemistry (Week 8)	<ul style="list-style-type: none"> <li>• Lignin <ul style="list-style-type: none"> <li>– Occurrence, monomers, polymerization, structures, physical properties</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Lignin modification <ul style="list-style-type: none"> <li>– Hydroxyl group modification</li> <li>– Degradation</li> <li>– Oxidation</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Lignin processing <ul style="list-style-type: none"> <li>– Fiber spinning</li> <li>– Carbon fibers</li> <li>– Foams</li> <li>– Applications</li> </ul> </li> </ul>
Protein chemistry (Week 9)	<ul style="list-style-type: none"> <li>• Principle of protein chemistry <ul style="list-style-type: none"> <li>– Amino acids</li> <li>– Primary structure</li> <li>– Secondary structure</li> <li>– Tertiary structure</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Silk <ul style="list-style-type: none"> <li>– Sources, purification, chemical composition, chemical structure, applications</li> </ul> </li> </ul>
(Week 10)	<ul style="list-style-type: none"> <li>• Soy protein <ul style="list-style-type: none"> <li>– Sources, purification, chemical composition, applications</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Keratin Fibers <ul style="list-style-type: none"> <li>– Sources, purification, chemical composition, applications</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Wool <ul style="list-style-type: none"> <li>– Chemical structures, physical properties, chemical reactions</li> </ul> </li> </ul>
Biodegradable polymers (Week 11)	<ul style="list-style-type: none"> <li>• PLA <ul style="list-style-type: none"> <li>– Lactic acid, source, fermentation</li> <li>– Polymerization</li> <li>– Physical properties, chemical properties, degradation</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• PLA <ul style="list-style-type: none"> <li>– Processing, products, applications</li> </ul> </li> </ul>
(Week 12)	<ul style="list-style-type: none"> <li>• Polyhydroxyalkanoates <ul style="list-style-type: none"> <li>– Types, chemical structures, biosynthesis, physical properties, biodegradation, applications</li> </ul> </li> </ul>
(Week 13)	<ul style="list-style-type: none"> <li>• Amino acid based biodegradable polymers <ul style="list-style-type: none"> <li>– Monomers, synthesis, structure, physical properties, biodegradation, applications</li> </ul> </li> </ul>

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will only be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:**

Lecture mid-term

25%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

In-class participation / activities

10%

Students will be provided with several ways in which to engage in group discussions and peer feedback. Some in-class sessions will be spent either discussing a particular topic (e.g. industrially available cellulosic polymers) or engaging in an in-class activity. Students will be expected to have completed the readings ahead of time and to come prepared for discussion.

Project / written critical reviews

25%

Students will be required to write 3 reviews over the term related to innovative biobased products produced by industry and/or new scientific breakthroughs in the field. Instructor will guide students to appropriate ideas around innovation.

Final lecture exam

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

## Attachment Forestry-2019-7

BEST 301: Bioenergy

**Instructor:** Dr. Hisham Zerriffi (Forest Resources Management)

**Teaching Assistants:** TBA

**Lecture time / location** – three, one hour lectures per week

**Credits:** 3

**Prerequisite:** BEST 202

**Course Description:** The first source of energy that humans harnessed was wood for making fire. Not much has changed in the millennia that followed. Despite adding in animal power, wind power and river power, it was not until the industrial revolution that biomass was no longer the dominant form of energy. Globally, 2.5 billion people still rely on biomass to meet their basic household energy needs. At the same time, however, from conversion of forest residues into wood pellets for electricity generation to high-tech approaches to create liquid fuels from plants, bio-energy has a significant role to play in sustainable energy futures. The challenge is that every energy conversion and technology comes with advantages and disadvantages and bio-energy is no exception. Concerns about land conversion from native forest to energy crop plantations, questions around the carbon impacts of bio-energy vs. fossil fuels, and the food vs. fuel debate have all influenced both public perception and policies around bio-energy. Navigating the transition to a sustainable world is humanity's current challenge. The degree to which bio-energy systems play a role and the impacts of that are the focus of this course. To explore this topic in depth, students will utilize a suite of tools and ideas across disciplines to understand the technical underpinnings of bio-energy, its social and environmental implications and the role of policy and economics in bio-energy futures.

**Learning Objectives:** Upon completion of this course, successful students will be able to:

- 1) Evaluate the social, environmental and economic impacts of bioenergy production
- 2) Apply the concept of material processing chains to understand conversion of biomass to useful energy
- 3) Utilize simple life-cycle approaches to calculate and understand the environmental implications of bio-energy
- 4) Assess the impacts of policies and regulations on bio-energy utilization
- 5) Utilize models and statistical analyses to calculate forest impacts of bio-energy systems evaluate net-carbon impacts of bio-energy systems

**Evaluation:** The course emphasizes both critical analysis and constructive student engagement through active participation in class discussions and providing constructive criticism and feedback.

**Problem Sets (40%):** There will be two problem sets per module for Modules 2-4. The problem sets will provide students with the opportunity to work through specific problems related to the in-class material and gain experience in utilizing various approaches to evaluating bio-energy systems.

**Final Exam (40%):** There will be no mid-term exam but there will be a final exam. **Student must pass the final exam in order to pass the course.**

**Discussion Questions (10%):** For each of Modules 2-4 the instructor will pose a discussion question, related to the course materials, to which you must provide a written response on the course website (1 page). The response should



integrate the knowledge you've gained from the reading, the lectures and your problem sets to address the core question of each module.

**Student Engagement (10%):** Students will be provided with several ways in which to engage in group discussions and peer feedback. Some in-class sessions will be spent either discussing a particular topic (e.g. energy models) or engaging in an in-class activity. Students will be expected to have completed the readings ahead of time and to come prepared for discussion. In addition, students will participate in discussions online through "Viewpoints" in an assigned Discussion Group. Please be aware of the course's themes throughout the semester, as you read the newspaper, watch television or browse the Internet.

- Approximately every three weeks (five times in total), you will post a link to a news article, blog post or similar online item regarding current events relevant to the coursework (a Viewpoint).
- You will then comment on the articles posted by other members of your Discussion Group.

You need not write at length (a link with a paragraph will do with each of your original posts, and a quick reply to those of others), but you should demonstrate an understanding of the core issues and how they relate to topics covered in the lectures and readings.

Grading for Viewpoints/Participation will be assessed on the combination of each student's in-class and online participation to accommodate the different ways in which students may engage with the course materials. On-line and in-class contributions do not have to be balanced, but students should attempt to contribute in both fora. For the online viewpoints, the course instructor and TA will be able to see if people have posted and responded and will then conduct random spot checks to examine the content of posts and comments.

### **Course Resources**

The course website will be on Canvas. Assignments will be posted to Canvas and students will submit assignments via Canvas. Students will also use Canvas to for course communication and will be expected to login on regularly.

### **Recommended Reading:**

Li (2017) *Bioenergy: Principles and Applications*. John Wiley and Sons, NJ.

GEA. (2012). *Global Energy Assessment - Toward a Sustainable Future*. Cambridge University Press, Cambridge, UK and New York, NY, USA and the International Institute for Applied Systems Analysis, Laxenburg, Austria.

Additional readings will come from recent scientific papers in the field.

### **Course Policies**

***Attendance:*** Following university regulation, regular attendance is expected of students. Students who neglect their academic work and assignments may be excluded from the final examinations (note: there are no exams in this course). Students who are unavoidably absent because of illness or disability should report to their instructor on return to classes.

The University accommodates students with disabilities who have registered with the Disability Resource Centre. The University accommodates students whose religious obligations conflict with attendance, submitting assignments, or completing scheduled assignments. Please let me know in advance, preferably in the first week of class, if you will require any accommodation on these grounds. Students who plan to be absent for varsity athletics, family obligations, or other similar commitments, cannot assume they will be accommodated, and should discuss their commitments with the instructor before the drop date.

***Late assignments:*** This course is not intended to run or ruin your life. So when exceptional circumstances will prevent you from completing an assignment on time, you may request an extension and it will be granted where possible and appropriate. In the absence of a granted extension, grades will be reduced by 5% per day for the first four days and 2% per day thereafter.

***Academic Dishonesty:*** Please review the UBC Calendar "Academic regulations" for the university policy on cheating, plagiarism, and other forms of academic dishonesty. Students should retain a copy of all submitted assignments (in case of loss) and should also retain all their marked assignments in case they wish to apply for a

## Review of Assigned Standing.

**Course Schedule:** The course is divided into four modules. With the exception of the first module, which provides an overview of bioenergy, each module will be arranged around a particular challenge or controversy and that will be the basis for the various topics in the module. Students will approach the core problem for that module from a multi-disciplinary perspective (techno-economic, socio-political, environmental).

### Module 1: Energy Systems in Perspective (1 Week)

This module will be a global and historical overview of our energy systems and a refresher on basic energy terms and concepts.

### Module 2: Traditional Bio-Energy Systems (3 Weeks)

This module will focus on the use of biomass for basic household cooking and heating energy. This is generally done in inefficient basic stoves with impacts at the household level (indoor air pollution and women's time-use collecting), the local level (sustainability of biomass harvesting, forest degradation) and the global level (emissions of climate forcing gases and particles). Various solutions exist (from more efficient biomass stoves to more clean and modern fuels) and each would have differing impacts on households and on local biomass resources. The core problem through which traditional bioenergy will be analyzed in this course is how to properly measure and account for the impact household energy use on forests and whether we can use changes in forest impacts as a way to finance household energy solutions (e.g. through carbon credits)

### Module 3: Liquid Bio-Fuels for Transportation (4 weeks)

Transportation has always been considered a difficult sector of our energy system to decarbonize as it consists of a large number of very small mobile sources of CO<sub>2</sub>. More relevant for this course, it is also based on an existing infrastructure for fueling vehicles with liquids and there are not necessarily a lot of ready alternatives (though electric vehicles are beginning to demonstrate their potential value). One option that would keep much of the existing transportation infrastructure and technology the same is to utilize liquid fuels that derive from biomass rather than fossil fuels. This module will cover the various pathways from biomass to liquid fuels and their relative pros and cons. A key issue that arises in considering liquid biofuels is the impact on land use and the competition between energy crops and food crops. The food vs. fuel debate and the "carbon debt" needed to pay back changes in land-use for biofuels will form the core of this module.

### Module 4: Bio-Electricity (4 weeks)

Meeting the climate goals laid out in the Paris Agreements will require substantial changes in how electricity, currently dominated by coal and other fossil fuels, is currently produced. This will become even more critical as other sectors that also rely on fossil fuels (e.g. transportation) become increasingly electrified. Renewable energy technologies such as wind and solar provide one solution but are hampered by the fact that they are less predictable and controllable (they are known as intermittent electricity sources). Electricity production from biomass has the potential advantage of being both renewable and dispatchable (i.e. the output of a power plant can be easily controlled). The biomass from electricity can come from both agricultural lands and forests with either dedicated production or by using residues. However, bio-electricity is still based on a combustion process that releases CO<sub>2</sub> and other pollutants into the atmosphere. This has led to the contention, on the one hand, that biomass is worse for the climate (or at BEST no better than coal) and, on the other hand, that it is automatically better for the climate since the CO<sub>2</sub> is reabsorbed in growing biomass. The focus of this module will be on understanding bio-electricity supply and use chains in order to evaluate the net carbon impact of using biomass for electricity.

## Attachment Forestry-2019-8

### **BEST 302 Laboratory in Bioeconomy Technology I** 3 Credits

**Catalogue Description:** Laboratory modules for bioeconomy technologies; bioenergy and bioproducts

**Instructor:** TBA

**Lecture time / location –** One 1-hour lecture

**Lecture time / location –** One 3-hour lab per week

**Office Hours:** TBA

**Prerequisite:** BEST 200

**Co-requisites:** BEST 300 and BEST 301

**Course goals:** There are two overarching themes for this course: provide students with a sense of variability of different biomass sources for the bioeconomy; and show how biomass can be transformed into useful and innovative products.

**Learning objectives:**

- Analyze sources of variations in biomass and understand the impact on conversion into bioproducts
- Demonstrate knowledge of traditional bioenergy benefits and hazards
- Propose appropriate pretreatment for saccharification based on biomass type
- Organize experimental methods and procedures for aerobic yeast-based fermentation
- Measure ethanol production from aerobic yeast fermentation
- Set-up appropriate reactor for bacterial fermentation without cross-contamination
- Prepare cellulose nanocrystals and describe processing requirements to create materials
- Devise 3-D printed biopolymer object and recommend conditions for optimal performance in-use,

**Potential Texts or sections thereof:**

- Genetic Improvement of Bioenergy Crops. W. Vermerris. Springer (2008).
- Biotechnology: The Biological Principles. M.D. Trevan, S. Boffey, KH Goulding, P. Stanbury. Open University Press, Taylor and Francis (1987).
- Introduction to Biotechnology. W.J. Thieman, M.A. Palladino. Pearson Education Inc. (2004)

**Recommended Texts:** Laboratory manual will be generated to support this course

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Introduction to biomass handling	<ul style="list-style-type: none"> <li>• Laboratory safety</li> <li>• Sampling, reproducibility/variability, and error</li> <li>• Observations in scientific measurements</li> </ul>	Lab activity (1 week)
Biomass compositional analysis	<ul style="list-style-type: none"> <li>• Moisture content</li> <li>• Ash content</li> <li>• Klason lignin analysis</li> <li>• Structural carbohydrate analysis</li> </ul>	Lab activity (2 weeks)
Traditional bioenergy: cookstoves and emissions	<ul style="list-style-type: none"> <li>• Heat efficiency with various biomass sources (wood pellets, charcoal, rice straw) and moisture content</li> <li>• Emission measurements</li> </ul>	Lab activity (2 weeks)
Biomass deconstruction and liquid fuel production	<ul style="list-style-type: none"> <li>• Biomass pretreatment</li> <li>• Enzymatic hydrolysis</li> <li>• Yeast plating</li> <li>• Aerobic fermentation</li> </ul>	Lab activity (3 weeks)
Nanocellulose isolation and characterization	<ul style="list-style-type: none"> <li>• Cellulose nanocrystal isolation</li> <li>• Viscosity measurements</li> <li>• Film casting with latex and film properties</li> </ul>	Lab activity (2 weeks)
3-D printing of polylactic acid	<ul style="list-style-type: none"> <li>• Design based problem solving</li> <li>• Polylactic acid (PLA) as a commercial biopolymer</li> <li>• Thermal properties and fusibility</li> <li>• Autocad and scanner-based systems for system designs</li> </ul>	Lab activity (3 weeks)

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:**

Reports

80%

Laboratory reports will be evaluated based on the ability to communicate technical content in a written format that includes objectives and justification for the work, appropriate graphics, tables, and figures, along with data interpretation and discussion.

Quizzes

10%

Quizzes will be given to assess students' preparedness for laboratory modules prior to beginning experimental work. Quizzes will be approximately 15 minutes in length and students will be notified in advance of the quiz dates.

In-class participation / activities

10%

Students are expected to participate in laboratory activities. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

## Attachment Forestry-2019-9

### **BEST 303**

Applied Biotechnology for Bioproducts  
3 credits

**Catalogue Description:** Use of microbiology and enzymology for processing and enhancing value of forest and agro-based Bioproducts; saccharification of biomass, fermentation, and product upgrading with biocatalysts.

**Instructor:** Jack Saddler

**Lecture time / location** – three, one hour lectures per week

**Office Hours:** TBA

**Prerequisites:** BEST 200 and BEST 300

### **Course Outline:**

Biotechnology is a key component in the transformation of biomass that includes conversion into chemicals, tailoring of fibre properties, and creating new biobased materials. The utilization, benefits and constraints of enzymes and micro-organisms for transformation in industrial scenarios will be highlighted in order for students to have a theoretical framework for working with biotechnology in the forest products industry. The course will demonstrate how the disciplines of biotechnology, (i.e. microbiology, enzymology, biochemistry, immunology), can be used to enhance the process and value of forest and agro-based products.

### **Learning Outcomes:**

Upon successful completion of the course, students will be able to:

- Define nature's own tools for catalytic processes and indicate how to apply in the various areas of forest and agro-based products value chain
- Justify the use of biotechnology instead of synthetic routes in existing commercial processes to produce chemicals and products
- Identify the causes of lignocellulose biomass recalcitrance and propose processes to enhance enzyme accessibility for biomass conversion
- Explain types of cellulases and role in saccharification of biomass
- Design a fermentation procedure indicating conditions necessary for yeast and bacterial systems
- Describe the potential of gene editing and synthetic biology to impact forest products biotechnology

### **Course Schedule (organized by topics):**

Topic	Potential lectures	Tutorial activity
Introduction to microbiology	<ul style="list-style-type: none"> <li>• Overview of biological micro-organism and metabolic processes.</li> </ul>	Review of biological topics

	<ul style="list-style-type: none"> <li>• Biocatalysis</li> <li>• Extracellular enzymes and cellosomes</li> <li>• DNA mutation, gene expression, and micro-organism engineering</li> </ul>	
Industrial use of biocatalysts and micro-organisms	<ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Food and beverage</li> <li>• Household care</li> <li>• Bioenergy</li> </ul>	Examples of household items and food products that utilize biotechnology—yogurt to blue jeans
Recalcitrance of lignocellulose biomass	<ul style="list-style-type: none"> <li>• Plant cell wall architecture of various species</li> <li>• Supramolecular structure of cellulose</li> <li>• Methods for pretreatment</li> </ul>	Tour of the process development unit (PDU) of the Forest Biotechnology group
Introduction to enzyme kinetics for soluble and insoluble substrates	<ul style="list-style-type: none"> <li>• Diffusion and Binding</li> <li>• Rates of various substrates from solubilized starch to insoluble cellulose</li> <li>• Temperature and pH</li> </ul>	Discussion and questions
Enzyme cocktails for cell wall deconstruction and cell wall modification	<ul style="list-style-type: none"> <li>• Different types of cellulases</li> <li>• Accessory enzymes</li> <li>• Laccases and oxidative enzymes</li> <li>• Pulp bleaching</li> </ul>	Detailed discussion of discovery of <i>T. reesei</i> fungus and role in modern biotechnology research
Practical issues of lignocellulose based sugars; inhibitors and toxicity	<ul style="list-style-type: none"> <li>• Classification of compounds that inhibit saccharification and fermentation</li> <li>• Solid liquor ratios</li> </ul>	Discussion on biomass source and extractives
Aerobic yeast fermentation	<ul style="list-style-type: none"> <li>• Requirements for fermentation</li> <li>• <i>Saccharomyces cerevisiae</i></li> <li>• Titre/yield of processes</li> </ul>	Examination of other systems—home brewing beer to sourdough bread
Bacterial based fermentation, from compost and biogas to synthetic biology	<ul style="list-style-type: none"> <li>• Bacterial production of drop-in fuels</li> <li>• <i>Clostridium thermocellum</i>, <i>Escherichia coli</i>, <i>Zymomonas mobilis</i>, <i>Acetobacter xylinum</i></li> </ul>	Discuss the field of synthetic biology and potential for the bioeconomy

### **Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:****Lecture mid-term**

30%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

**Participation**

10%

Students are expected to participate in class discussion. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

**Project Presentation**

20%

Students will provide one oral presentation during the term on a class related topic. The presentation should last 10 minutes and incorporate learning objectives from lecture. Quality of presentations, thoroughness in responding to critique and questions posed by other students and instructor(s), and an evaluation by the individual's team members.

**Final lecture exam**

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.



## Attachment Forestry-2019-10

### **BEST 304 Laboratory in Bioeconomy Technology II**

3 Credits

**Catalogue Description:** Laboratory modules for bioeconomy technologies; plant breeding, transgenics and recombinant protein production.

**Instructor:** TBA

**Lecture time / location** – One 1-hour lecture

**Lecture time / location** – One 3-hour lab per week

**Prerequisite:** BEST 302

**Co-requisite:** BEST 303

**Course goals:** The course will provide understanding into the applied biotechnology for the production of designer plants and plant-based proteins. Students will be able to describe constraints to biological transformation along with the potential to form innovative strategies for breeding and generation of future plants and plant-derived products.

**Learning objectives:**

- Establish proper lab safety and aseptic techniques
- Identify potential sources of contamination in biological transformation
- Describe tools for plant breeding and selection
- Explain marker aided selection of plants
- Explain function of plasmid vectors in molecular cloning
- Evaluate techniques and tools for generating transgenic plants
- Select techniques for the production of recombinant protein production

**Potential Texts or sections thereof:**

- Genetic Improvement of Bioenergy Crops. W. Vermerris. Springer (2008).
- Applied Plant Genomics and Biotechnology. P. Poltronieri and Y. Hong (Eds). Woodhead Publishing (2015).
- Metabolic Engineering. S.Y. Lee and E.T. Papoutsakis (Eds.) Marcel Dekker, Inc. (1999).
- Metabolic Engineering: Principles and Methodologies. G.N. Stephanopoulos, A.A. Aristidou, J. Nielsen. Academic Press (1998).

**Recommended Texts:** Laboratory manual to be generated to support course material

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Introduction	<ul style="list-style-type: none"> <li>• Biological lab safety</li> <li>• Contamination</li> <li>• Strategies in biological transformation</li> </ul>	Lab activity (1 week)
Plant breeding	<ul style="list-style-type: none"> <li>• Breeding tobacco with strategic crosses</li> <li>• Validating crosses using markers and PCR detection</li> </ul>	Lab activity (3 weeks)
Transgenic Plant Production	<ul style="list-style-type: none"> <li>• Plant tissue culture</li> <li>• Generation of transgenic plants (stable and transient)</li> <li>• Visualization of marker proteins in plants (Green Fluorescent Protein; GFP)</li> </ul>	Lab activity (4 weeks)
Recombinant Protein	<ul style="list-style-type: none"> <li>• Transform bacterial strains</li> <li>• Produce recombinant protein from microorganisms and measure activity</li> </ul>	Lab activity (3 weeks)
Validate Breeding and Transgenic plants	<ul style="list-style-type: none"> <li>• Validate plant breeding</li> <li>• Validate transgenic plants</li> </ul>	Lab activity (2 weeks)

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:****Reports**

80%

Laboratory reports will be evaluated based on the ability to communicate technical content in a written format that includes objectives and justification for the work, appropriate graphics, tables, and figures, along with data interpretation and discussion.

**Quizzes**

10%

Quizzes will be given to assess students' preparedness for laboratory modules prior to beginning experimental work. Quizzes will be approximately 15 minutes in length and students will be notified in advance of the quiz dates.

**In-class participation / activities**

10%

Students are expected to participate in laboratory activities. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

## Attachment Forestry-2019-11

BEST 400 (3) Biomimicry and Biocomposites

**Catalogue Description:** Nature inspired material design. Applied chemical and physical aspects of natural material formation as template for biomimetic materials. Introduction to principles of self-assembly, hierarchical structures, biocomposites, and unique adaptive structures.

**Instructor:** Dr. Scott Renneckar, FSC 4034, 604-827-0637; [scott.renneckar@ubc.ca](mailto:scott.renneckar@ubc.ca)

**Lecture time / location** – three, one hour lectures per week

**Office Hours:** TBA

**Prerequisites:** BEST 300

**Course Overview:** Materials that are lightweight, tough and mechanically resilient are found throughout nature. These materials are created under ambient processing conditions with reactants that are non-toxic and can be recycled at the end of their life. Adopting these nature inspired designs and synthesis principles is the foundation of biomimicry. This course will offer students an introduction to the principles of structure-property relationships to describe the behaviour of natural materials. Additionally the students will be provided with the applied chemistry and physics background to discuss technical aspects of material design, natural material life cycles with impact on carbon, silica, and nitrogen fixation, and how natural materials have created solutions for highly interesting properties such as superhydrophobic surfaces, structural color, and stimuli responsive materials. Further the course will emphasize how biological diversity in the natural world provides an unparalleled resource to learn design clues for motifs for the efficient partitioning of limited resources to meet unique material functionality.

**Learning objectives:**

Through this course, successful students will:

1. Compare biomimetic design attributes with traditional design paradigms
2. Review natural systems and define biological need for given performance
3. Differentiate how selected functions of various organisms arise from structure of given tissue
4. Describe conditions and attributes that lead to the self-assembly of molecules into organized structures
5. Explain how natural materials use anisotropy and morphology to impact material properties
6. Justify basics of fibrous materials, including both natural based and synthetic fibers is a design motif repeated through structural systems
7. Interpret how nanotechnology provides opportunity for the production of biomimetic materials

**Evaluation of student learning:**

**Lecture mid-term**

30%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

Quizzes

10%

Short assessments of student progress will be given in the form of a quiz covering individual topics. These quizzes will be given after the completion of each topic to assess students' understanding of course material prior to moving on to the next topic. Quizzes will be approximately 15 minutes in length and students will be notified in advance of the quiz dates.

Participation

10%

Students are expected to participate in class discussion. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

Project presentation

10%

Students will develop a technical presentation on a commercially available product that utilized biomimicry; students will be evaluated on the ability to orally communicate key concepts from class utilized in the product

Multi-media report

10%

Students will be expected to create a multimedia report to convey conceptual information about multifunctional materials. The content must include animated, recorded, and/or dynamic information.

Final lecture exam

30%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

Course Resources:

Course website will be available that students are expected to use it for checking grades and obtaining lecture materials.

Baumeister, Dayna. Biomimicry resource handbook: a seed bank of BEST practices. Biomimicry 3.8, 2014. (286 pp.)

Bhushan, B., Biomimetics: lessons from nature—an overview. 2009. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 367(1893): 1445-1486. (41 pp.)

Chen, Po-Yu, Joanna McKittrick, and Marc André Meyers. (2012) "Biological materials: functional adaptations and bioinspired designs." Progress in Materials Science 57(8): 1492-1704. (212 pp.)

Lehn, Jean-Marie, and Janine Benyus. *Bioinspiration and biomimicry in chemistry: reverse-engineering nature*. John Wiley & Sons, 2012. (508 pp.)

Course Schedule (organized by modules):

Topic	Potential lectures
Methodology for Design (week 1 and 2)	<ul style="list-style-type: none"> <li>Methods for problem solving and design based thinking</li> </ul>
Biodiversity of materials in nature (week 3)	<ul style="list-style-type: none"> <li>Unique properties of natural materials and the survival problems they address</li> </ul>
Structural and functional materials in nature (week 4)	<ul style="list-style-type: none"> <li>Molecular and morphological aspects of shells, scales, spider web, skin, horn, hair, fibre, feather, bone, antler, and plant cell walls</li> </ul>
Building blocks of natural materials and self-assembly (week 5-7)	<ul style="list-style-type: none"> <li>Proteins and carbohydrates; nomenclature of amino acids and carbohydrates, colloidal systems; crystal structures of both polymer and inorganic systems;</li> </ul>

Physical properties (week 8)	<ul style="list-style-type: none"> <li>• Mechanics of materials: strength, stiffness, energy dissipation and viscoelasticity</li> </ul>
Fibres and fibre formation (week 9)	<ul style="list-style-type: none"> <li>• Plant, animal, and synthetic fibres</li> </ul>
Biocomposites (week 10-11)	<ul style="list-style-type: none"> <li>• Introduction to composite theory, stress transfer across interfaces, dissection of features of nacre and shell</li> </ul>
Multifunctional materials utilizing biomimetic design including structural color and superhydrophobicity (week 12-13)	<ul style="list-style-type: none"> <li>• Examples of how controlled structural features at nanoscale impact macroscale properties, including superhydrophobicity of lotus leaves, slippery surfaces of pitcher plants, and structural color of butterfly wings. Role of new nanotechnologies in mimicking natural materials.</li> </ul>

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

## Attachment Forestry-2019-12

### **BEST 401 Carbon and Energy Economics** 3 Credits

**Catalogue Description:** Understanding key issues for carbon management; protocols for carbon accounting and methodologies for emissions inventories and carbon costing. Economics and business response to climate change.

**Instructor:** Dr. Gary Bull

**Lecture time / location** – three, one hour lectures per week:

**Office Hours:** TBD

**Prerequisites:** ECON 101

**Course goals:** The goal of this course is to provide insight into the carbon economy covering aspects of carbon and emission accounting using industry standard models. Students will be able to exam carbon economics through the lens of economic theory along with insight into carbon finance such as cap and trade and carbon tax.

**Learning objectives:**

- Define basic principles of carbon accounting including units of measure
- Differentiate between biogenic carbon and carbon sinks
- Compare official international inventories and models used for carbon accounting
- Explain monetary inventories to determine cost of a tonne of a CO<sub>2</sub>
- Distinguish benefits and costs of various carbon finance scenarios
- Judge roles of various carbon institutions on impact for decarbonization
- Debate voluntary versus compliance markets for carbon regulation

**Required Texts:**

Brohé, A., 2017. *The handbook of carbon accounting*. Routledge.

**Recommended Texts:**

**The New Carbon Economy: Constitution, Governance and Contestation**

Peter Newell (Editor), Max Boykoff (Editor), Emily Boyd (Editor)

ISBN: 978-1-444-35022-7

Feb 2012, Wiley-Blackwell

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Carbon and Emission Accounting (3 week)	<ul style="list-style-type: none"> <li>• Forest – offsets, conservation</li> <li>• Manufacturing</li> <li>• Supply Chain</li> <li>• Products</li> <li>• Certification</li> <li>• GHG reporting</li> <li>• Models (CBM3, FORECAST, FPS, FCM, EFISCEN, IIASA-GFM, GLOBIOM)</li> </ul>	Readings and discussion
Carbon Finance (2 weeks)	<ul style="list-style-type: none"> <li>• Carbon tax</li> <li>• Carbon cap and trade</li> <li>• Carbon price</li> <li>• Market players</li> </ul>	Readings and discussion
Carbon Ownership (2 weeks)	<ul style="list-style-type: none"> <li>• Regulations</li> <li>• Contracts</li> <li>• Standards/protocol</li> <li>• -- Measurement/Statistics-quantification</li> <li>• -- Leakage</li> <li>• -- Uncertainty/Risk</li> <li>• -- Baseline/Additionality</li> <li>• --Buffering</li> <li>• --Social /Enviro Impacts</li> <li>• -- Ex-ante, Ex-post</li> </ul>	Readings and discussion
Carbon Institutions (2 weeks)	<ul style="list-style-type: none"> <li>• Registries and exchanges</li> <li>• Insurers</li> <li>• Regulators</li> <li>• NGOs/Industry</li> <li>• WB&lt; IFC, FT, IPCC- UN</li> </ul>	Readings and discussion In-class activity
Carbon Economics (3 weeks)	<ul style="list-style-type: none"> <li>• Economic theory</li> <li>• Transaction cost and neo-institutional economics</li> <li>• Marginal abatement/sequestration costs</li> <li>• Optimizing shareholder value/returns</li> <li>• Trade-offs</li> <li>• Voluntary versus compliance markets</li> <li>• Market demand curves –IATA</li> <li>• Competition of resources, opportunity costs, shadow pricing</li> </ul>	Readings and discussion Case study review

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:****Lecture mid-term**

30%

Students will be examined on basic concepts learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

**Quizzes**

20%

Quizzes will be given to assess students' understanding of individual topics prior to moving on to the next topic. Quizzes will be approximately 15 minutes in length and students will be notified in advance of the quiz dates.

**In-class participation / activities**

10%

Students are expected to participate in class discussion and activities. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

**Final lecture exam**

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.



## Attachment Forestry-2020-13

### **BEST 402 Industrial Ecology** 3 Credits

**Catalogue Description:** Concepts in sustainability around technology and material use; relevance of biological ecology to industrial ecology; life cycle analysis; components and applications; and approaches to design.

**Instructor:** TBA

**Lecture time / location** – 3 1-hour lectures per week + one 2-hour tutorial

**Lecture time / location** – TBA

**Prerequisites:** BEST 200

**Course goals:** Students will be introduced to systems analysis in order to understand how human activities such as energy and materials consumption, waste generation, and pollutants can be managed and tracked through material and energy flow analysis.

**Learning objectives:**

At the end of the course, the students will have a conceptual framework for sustainability and systems level thinking for industrial ecology, along with practical aspects of materials flow analysis. Students will be able to:

- Compare biological ecology to industrial ecology and describe key commonalities and differences
- Identify issues in quantifying sustainability
- Discuss the components of sustainability in relation to temporal and spatial boundaries
- Conceptualize individual elements of the bioeconomy as part of a system of complex systems
- Characterize social dimensions related to culture, governance and economics within industrial ecology
- Describe how to set boundaries for life cycle assessment
- Quantify material flow for a variety of bioeconomy processes
- Assess databases of material accounts and differences amongst common LCA software

**Required Texts or sections thereof:**

- Industrial Ecology and Sustainable Engineering, T.E. Graedel and B.R. Allenby, Prentice Hall, 2010. pp 403.
- Linking Industry and Ecology: A question of Design, R. Cote, J. Tansey, and A. Dale. UBC Press 2006.
- Materials Count: The Case for Material Flows Analysis, The National Academies Press, Washington DC. (2004)

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial / Lab activity
Introduction	<ul style="list-style-type: none"> <li>• Concepts of integrated systems</li> <li>• Defining sustainability</li> <li>• Analytical components, tools</li> </ul>	Lab activity (1 week)
Concepts in sustainability	<ul style="list-style-type: none"> <li>• Quantifying sustainability</li> <li>• Connecting industrial ecology to sustainability</li> </ul>	Discussions, student perspectives
Biological ecology relevance to industrial ecology	<ul style="list-style-type: none"> <li>• Biological and industrial ecosystems</li> <li>• Utility of biological approach</li> <li>• Industrial symbiosis and circular economy</li> </ul>	Case study, Circular economy
Social dimensions of industrial ecology	<ul style="list-style-type: none"> <li>• Social ecology</li> <li>• Consumption</li> <li>• Government and governance</li> </ul>	Discussion, personal consumption and outside factors
Lifecycle assessment	<ul style="list-style-type: none"> <li>• Life Cycle Inventory Analysis (LCI), Life Cycle Impact Assessment (LCIA), Life Cycle Interpretation</li> <li>• System boundaries</li> <li>• Software</li> </ul>	Software introduction
Materials flows accounting	<ul style="list-style-type: none"> <li>• Materials flow databases</li> <li>• Global databases</li> <li>• </li> </ul>	Software laboratory
Resources and material production	<ul style="list-style-type: none"> <li>• Energy</li> <li>• Water</li> <li>• Air</li> <li>• Rare earth elements</li> </ul>	Software laboratory
Product use and end of life management and business and policy incentives	<ul style="list-style-type: none"> <li>• Design strategies</li> <li>• Remanufacturing</li> <li>• Recycling</li> <li>• Disposal</li> </ul>	Software laboratory

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:****Lecture mid-term**

25%

Students will be examined on basic concepts in learned in lecture and lab covered in classes prior to the exam. The midterm exam will include a combination of multiple choice, short answer and essay questions.

**Term paper**

25%

Students will write a term paper about a chosen topic covered in the course related to the bioeconomy. The paper will be based on a traditional or emerging product in the bioeconomy and apply industrial ecology principles and tools to assess the environmental impacts associated with the product and identify opportunities for improvement. The paper should include an introduction, main analysis, and conclusion with the use demonstrated use of LCA software for analysis, as appropriate for the scope of the paper. It should be no longer than 10 pages (font 12, 1.5 spaced including references). The main criteria for grading this assignment will be the logical organization of the paper, demonstration of knowledge of the chosen topic, clarity of analysis of the topic based on topics covered in the course, correct use of references, and a well-developed conclusion.

**In-class participation / activities**

10%

Students are expected to participate in class discussion and tutorial activities. Students will be graded based on their contribution to class discussions and completing in class activities meant as formative assessments. . Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

**Final lecture exam**

40%

The final exam will be a comprehensive exam that integrates all learning outcomes gained throughout the course. The exam will cover basic concepts and incorporate scenarios and problem solving. The final exam will include a combination of multiple choice, short answer and essay questions.

## Attachment Forestry-2019-14

BEST 403  
Integrated Strategies for Bioproduct Innovation  
3 credits

**Catalogue Description:** Project-based course on development of bioeconomy products; demonstration of out-of-box thinking, service learning and teamwork.

**Instructor:** TBD

**Lecture time / location** – two, one hour lectures per week and one, three hour design lab

**Office Hours:** TBA

**Prerequisites:** Restricted to BEST majors

### **Course Outline:**

Students will integrate course curriculum to develop a novel bioproduct for a defined problem providing students opportunity to learn about project management. The course will highlight ways that design merges aesthetic and functional attributes utilizing new biobased materials and manufacturing in order to understand innovation in product development. Lectures will focus on project development strategies specific to the scope and scale of assigned projects including design based thinking, project management, time management, and allocation of responsibilities among group members. Written and oral assignments will reinforce comprehension of business-oriented skills and strategies that are necessary to a successful final project. The project will require students to draw on technical skills such as laboratory techniques, GIS application (if applicable), life cycle assessment, and technical writing as well as apply theory to support rationale for work.

### **Learning Outcomes:**

Upon successful completion of the course, students will be able to:

- Evaluate context for innovation within institutions
- Indicate design tools that should be shared amongst team members and stakeholders
- Define a problem that needs an innovative bioproduct solution, not the other way around of a “solution” needing a problem
- Plan the synthesis of a bioproduct and identify material flow analysis for the product
- Demonstrate the use of proper project management tools
- Prepare an in-depth technical report

### **Required Texts or sections thereof:**

- National innovation systems: a comparative analysis. Nelson, Richard R., ed. Oxford University Press on Demand, 1993.
- Design inspired innovation, Utterback, J. et al., World Scientific Publishing Co. Singapore, (2006) pp 259
- The Simplicity Shift: Innovative Design Tactics in a Corporate World, S. Jenson, Cambridge University Press (2002) pp 174.
- Project Management, Second Edition, G. Heerkens, McGraw Hill New York (2014)

**Course website:** TBA

**Course Schedule (organized by modules):**

Topic	Potential lectures	Tutorial activity
Introduction to innovation systems	<ul style="list-style-type: none"> <li>• Definitions of innovation and product/service examples</li> <li>• Internal factors in national innovative systems</li> <li>• Institutional culture in innovation</li> </ul>	Group discussion based on assigned topics
Design based thinking	<ul style="list-style-type: none"> <li>• Analytical thinking vs. design thinking for problem solving</li> <li>• Brain-storming methods and tools</li> </ul>	Brainstorming exercises
Utilizing design tools	<ul style="list-style-type: none"> <li>• Design classics</li> <li>• Integrating function and design</li> <li>• Managing the design process</li> </ul>	TED talk (IDEO) and discussion
Project management tools	<ul style="list-style-type: none"> <li>• Planning and estimating</li> <li>• Team building</li> <li>• Scope management</li> <li>• Risk and uncertainty</li> </ul>	Role playing exercise as managers
Technical report writing	<ul style="list-style-type: none"> <li>• Writing style</li> <li>• Report formats</li> <li>• Communication using graphics and illustrations</li> <li>• Use of appendices</li> <li>• Reports as a decision making tool</li> </ul>	Peer to peer review of writing samples

**Expectations for student writing:**

**All portions of all assignments and quizzes / tests must be the student's own, original work and must not contain the work of others in phrasing, format, or content.** Proper citation according to course guidelines of materials derived from other sources is mandatory. **All wording should be the student's OWN and not that of another author.**

As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

**Evaluation of student learning:**

**Participation**

10%

Students are expected to participate in class discussion. Students will be graded based on their contribution to class discussions. Regular attendance is required to obtain full understanding of the course materials thus, will be a consideration when assigning the participation mark.

Short essays

20%

For each of the topic areas (innovation systems, design based thinking, design tools, and project management tools) the instructor will pose a discussion question, related to the course materials, to which you must provide a written response on the course website (1 page). The response should integrate the knowledge the student has gained from the reading and the lecture materials to address the core question of each topic area.

Project Presentation

25%

Students will provide two oral presentations during the term on their project. The presentation should last 20 minutes. The first presentation will be related to the problem identified by the student group and plan to address it. The second presentation will summarize the solution, highlighting the design process used and innovative aspects of project. Quality of presentations, thoroughness in responding to critique and questions posed by other students and instructor(s), and an evaluation by the individual's team members. A rubric will be provided to the students prior to the presentation.

Project check-ins

15%

Students will provide short responses (500 words) during the first 6 weeks of the course to show they comprehend the required components of the final project. Examples include demonstrating understanding of innovation and design and proposing how these concepts will be included in their project and choice and utilization of project management tools for their project.

Technical Report

30%

Students will write a technical report about their group project. The paper should include an introduction, main analysis, and conclusion with recommendations. The work should reflect the corresponding content and style highlighted in the lecture materials, handouts, and discussions. It should be no longer than 20 pages (font 12, 1.5 spaced including references). The main criteria for grading this assignment will be the logical organization of the paper, demonstration of knowledge of the chosen topic, clarity of analysis of the topic based on topics covered in the course, correct use of references, and a well-developed message that can be used to make an informative decision about the project.



19 September 2018

To: Vancouver Senate

From: Senate Curriculum Committee

Re: Summer Curriculum Proposals (approval)

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In accordance with rule 28 (b) of the *Rules and Procedures of the Vancouver Senate*, this is to inform you that at its meeting of 16 July 2018, the Senate Curriculum Committee approved the attached proposals from the faculties of Arts, Education, Land and Food Systems, Law, Graduate and Postdoctoral Studies (Applied Science, Law, and Medicine), and Science.

The following is recommended to Senate:

**Motion:**       *“That Senate ratify the decisions of the Senate Curriculum Committee regarding the attached proposals.”*

Respectfully submitted,

Dr. Peter Marshall, Chair  
Senate Curriculum Committee



## FACULTY OF ARTS

### *New courses*

**ANTH 203** (3) Anthropology of Drugs; **ANTH 205** (3) The Anthropology of Insurrections and Revolution; **ANTH 206** (3) Witches, Vampires, and Zombies: Anthropology of the Supernatural; **ANTH 240** (3) Sport in Society and Culture; **ARTH 309** (3) Arts of Africa and the African Diasporas; **CLST 329** (3) Ancient Greek Warfare; **ECON 315** (3) Intermediate Microeconomics I; **ECON 316** (3) Intermediate Microeconomics II; **ENGL 382** (3-6) d Theory: Anti-/De-/Post-Colonization; **ENGL 390** (3-6) d Theory: Life Narrative; **HIST 240** (3) Health, Illness and Medicine I: From the Ancient World to the Early Modern Period; **HIST 241** (3) Health, Illness and Medicine II: The Modern World from 1700 to the Present; and **PHIL 351** (3) Philosophical Perspectives on Cognitive Systems Research.

### *New emphasis*

Major in English, Emphasis Language and Literature

## FACULTY OF EDUCATION

### *New courses*

**ECED 490** (2) Early Childhood Education Practicum & Seminar I; **ECED 491** (3) Early Childhood Education Practicum & Seminar II; **ECED 495** (3) Early Childhood Education Practicum & Seminar III; **KIN 265** (3) Nutrition, Physical Activity, and Health; and **KIN 357** (3) Laboratory Investigations in Neuromechanical Kinesiology.

## FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

### **Applied Science**

#### *New courses*

**MINE 586** (3) Advanced Mine Waste Management; **MINE 587** (3) Advanced Mine Site Management; **MINE 588** (3) Risk Assessment for Mine Waste Management; and **MINE 589** (3) Mine Waste Management Case Studies.

### **Law**



*New courses*

**LAW 519** (3) Individual Employment Law; **LAW 523** (1-3) d Topics in Intellectual Property; **LAW 537** (3) Commercial Transactions; **LAW 538** (3) Secured Transactions; **LAW 540** (3) Insurance Law; **LAW 539** (1-3) d Topics in Constitutional Law; **LAW 543** (1-3) d Topics in Public Law; **LAW 547** (1-3) d Topics in Commercial Law; **LAW 548** (3) Sports Law; **LAW 551** (3) Trusts; **LAW 558** (1-3) d Topics in First Nations Law; **LAW 559** (3/4) d Family Law; **LAW 570** (1-3) d Intellectual Property; **LAW 571** (3) Communications Law; **LAW 572** (3) Cyberspace Law; **LAW 573** (3) Media and Entertainment Law; **LAW 577** (3) Immigration Law; **LAW 574** (3) Succession; **LAW 575** (3) Equitable Remedies; **LAW 576** (3) Securities Regulation; **LAW 578** (3) Refugee Law; **LAW 586** (3) Sustainable Development Law; **LAW 587** (3/4) d Environmental Law; **LAW 590** (3) Civil Procedure; **LAW 591** (3) Environmental Law Workshop; **LAW 592** (3) Conflict of Laws; **LAW 594** (1-3) d Topics in Corporate Law; **LAW 595** (3) Forest Law; and **LAW 599** (3) Creditors' Remedies.

**Medicine***New courses*

**SPPH 569** (3) Industrial and Environmental Acoustics and Vibration.

**FACULTY OF LAND AND FOOD SYSTEMS***New minor*

Minor in Sustainable Food Systems

**FACULTY OF LAW***New J.D. Degree Requirement*

Experiential Learning Credit Requirement

**FACULTY OF SCIENCE***Revised requirements*

Science Breadth requirements

# Faculty of Arts

## Curriculum Committee Report Category **ONE** Proposals

**Faculty of Arts Meeting: April 19, 2018**  
**Forwarded to Senate Offices: May 9, 2018**

### Arts Curriculum Committee Members:

Christina Hendricks, *Chair*

Silvia Bartolic

Katherine Bowers

Stefania Burk *ex officio, voting*

Christine D'Onofrio

Nisha Malhotra

Keith Bunnell *ex-officio*

Nancy Campbell *ex-officio*

Heidi May *ex-officio*

Lois Nightingale *ex officio*

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## UNDER Graduate Course Proposals

### ANTH: Anthropology

#### ***ANTH 205 (3) The Anthropology of Insurrections and Revolution***

<b>Category: (1) Faculty:</b> Arts <b>Department:</b> Anthropology <b>Faculty Approval Date:</b> April 19, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2018	<b>Date:</b> November 30, 2017 <b>Contact Person:</b> Gaston Gordillo <b>Phone:</b> 2-3797 <b>Email:</b> gordillo@mail.ubc.ca
<b>Proposed Calendar Entry:</b>  <b>ANTH 205 (3) The Anthropology of Insurrections and Revolution</b>  <b>Analysis of insurrections and revolutions from a comparative perspective.</b>	<b>URL:</b> N/A  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New course  <b>Rationale for Proposed Change:</b> Insurrections and revolutions have been crucial events in world history that have profoundly shaped the contemporary world. And as the 2011 Arab Spring showed, these events continue being part of the political landscape of the 21 <sup>st</sup> century. UBC, however, currently offers no courses devoted to examining this subject matter.  This course will therefore cover an important and timely topic that will be of interest to students not only in anthropology but also across the Faculty of Arts, especially in political science, sociology, and history. This course will complement existing courses in the Faculty of Arts on politics, social movements, protests, and violence, such as POLI 100 (Introduction to Politics), POLI 260 (Introduction to Global Politics), SOCI 425 (Social Movements) and HIST 425 (War and Society).

#### ***ANTH 206 (3) Witches, Vampires, and Zombies: Anthropology of the Supernatural***

<b>Category: (1) Faculty:</b> Arts <b>Department:</b> Anthropology <b>Faculty Approval Date:</b> April 19, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2018	<b>Received:</b> January 23, <b>Contact Person:</b> Sabina Magliocco <b>Phone:</b> (604) 822-6798 <b>Email:</b> sabina.magliocco@ubc.ca
	<b>URL:</b> N/A

<p><b>Proposed Calendar Entry:</b></p> <p>ANTH 206 (3) Witches, Vampires, and Zombies: Anthropology of the Supernatural</p> <p>Anthropological approaches to supernatural beliefs in both traditional and contemporary societies.</p>	<p><b>Present Calendar Entry:</b> None</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale for Proposed Change:</b></p> <p>Meets student need for 200-level elective (enrollment in 200-level courses has increased by 25% in the last 10 years).</p> <p>Contributes to undergraduate critical thinking, reading, and writing skills to make sense of a cultural landscape in which the supernatural is prominently featured in media productions and popular belief systems.</p> <p>Adds a lower-division elective on the anthropology of religion, now covered only at the 400 level.</p>
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***ANTH 240 (3) Sport in Society and Culture***

<p><b>Category: 1 Faculty:</b> Arts  <b>Department:</b> Anthropology  <b>Faculty Approval Date:</b> April 19, 2018  <b>Effective Session (W or S):</b> W  <b>Effective Academic Year:</b> 2018</p>	<p><b>Date:</b> October 12, 2017  <b>Contact Person:</b> Bruce Miller  <b>Phone:</b> 604-822-6336  <b>Email:</b> bgmiller@mail.ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p>ANTH 240 (3) Sport in Society and Culture</p> <p>Sport within the context of historic and contemporary society.</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New Course</p> <p><b>Rationale for Proposed Change:</b></p> <p>This lower-level Anthropology course considers sport within the context of historic and contemporary society. The role of sport in contested social and cultural change is a theme as is the varieties and meanings of sports cross-culturally. Anthropological methods, including</p>

	ethnography, applied to the study of sport makes this course distinctive.
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**CNRS: Classical, Near Eastern, and Religious Studies (for Re-Review)**


**CLST 329 (3) Ancient Greek Warfare**

Category: 1 Faculty: ARTS Department: CNERS Faculty Approval Date: November 19, 2017 Effective Session (W or S): W Effective Academic Year: 2018	Date: January 8, 2018 Contact Person: Carl Johnson Phone: 604-822-7975 Email: carl.johnson@ubc.ca
<b>Proposed Calendar Entry:</b>  <b>CLST 329 (3) Ancient Greek Warfare</b>  Ancient Greek methods and tactics of war plus underlying social, religious and philosophical concepts relating to warfare, through sources in translation.	URL: “CLST” <b>Present Calendar Entry:</b> NONE  <b>Type of Action:</b> NEW COURSE  <b>Rationale for Proposed Change:</b> The study of war and warfare is a fundamental part of almost all studies of ancient Greek and Roman antiquity. From Homer through the Greek lyric poets, tragedians, historians, rhetorician and philosophers, the subject and nature of war is examined and discussed. A course which pays specific attention to the phenomenon of war and warfare will greatly add to the knowledge and understanding of any student of the ancient Classics. It will also be of interest to students who study ancient Rome considering the great impact of Greek culture and society on Roman civilization. Finally, the course is of contemporary interest seeing that the modern wars of the West and the current “global war on terror” continue to be examined based upon the narratives of the ancient world relating to war.


**ECON: Vancouver School of Economics**

**ECON 315 (3) Intermediate Microeconomics I**

<b>Category: (1) Faculty:</b> Arts <b>Department:</b> Vancouver School of Economics	<b>Recd:</b> January 25, 2018 <b>Contact Person:</b> Triny Shen <b>Phone:</b> 604-827-9819 <b>Email:</b> triny.shen@ubc.ca
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<p><b>Faculty Approval Date:</b> April 19, 2018</p> <p><b>Effective Session (W or S):</b> W</p> <p><b>Effective Academic Year:</b> 2018</p>	
<p><b>Proposed Calendar Entry:</b></p> <p><b>ECON 315 (3) Intermediate Microeconomics I</b></p> <p>Consumer behaviour, producer theory, exchange, monopoly, oligopoly, externalities, public goods, general equilibrium and welfare economics. Registration restricted to students in the Bachelor of International Economics Program. Credit will be granted for only one of ECON 315 and ECON 201, ECON 204, ECON 301, ECON 304, ECON 308, COMM 295, FRE 295. <i>This course is not eligible for Credit/D/Fail grading.</i></p> <p><i>Prerequisite:</i> All of ECON 101, ECON 102, MATH 105, and one of MATH 104, MATH 184.</p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> Create new course</p> <p><i>Note: These new courses are more of an administrative addition. Previously the BIE program was offering this subject area as one 6 credit course. This proposal creates two 3 credit courses to allow greater flexibility for students. The original course (ECON 308) will be kept active for use in the Spring/Summer sessions.</i></p> <p><b>Rationale for Proposed Change:</b> BIE students are currently required to take ECON 308 (6) Intermediate Microeconomic Analysis. The year-long course design causes difficulty with instructor(s) scheduling, teaching, student transfer, registration, evaluation, and concession. Therefore we propose to split the 6-credit course into two 3-credit courses, both of which BIE students will be required to take (ECON 315 and 316 as proposed). The two new courses will cover all the contents in the original ECON 308 (6). The proposed change will in no way reduce the quality and rigor of the BIE curriculum.</p> <p> <b>Not available for Cr/D/F grading (undergraduate courses only)</b></p> <p><b>Rationale for not being available for Cr/D/F:</b> Course is restricted to students in the BIE for whom it is a core requirement. It is used in calculation of student core average to determine continuation eligibility and graduation standing and cannot be taken without a grade.</p>

***ECON 316 (3) Intermediate Microeconomics II***

<p>Category: (1) Faculty: Arts  Department: Vancouver School of Economics  Faculty Approval Date: April 19, 2018  Effective Session (W or S): W  Effective Academic Year: 2018</p>	<p>Recd: January 25, 2018  Contact Person: Triny Shen  Phone: 604-827-9819  Email: triny.shen@ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>ECON 316 (3) Intermediate Microeconomics II</b></p> <p>Advanced topics in intermediate microeconomics: risk and uncertainty, some concepts in game theory, adverse selection, moral hazard, bargaining, auctions. Registration restricted to students in the Bachelor of International Economics Program.  Credit will be granted for only one of ECON 316 and ECON 303, ECON 306 or ECON 308.  <i>This course is not eligible for Credit/D/Fail grading.</i></p> <p><b>Prerequisite:</b> One of ECON 301, ECON 304, ECON 315</p>	<p><b>URL: “ECON”</b></p> <p><b>Present Calendar Entry:</b>  N/A</p> <p><b>Type of Action:</b>  Create new course.</p> <p><i>Note: These new courses are more of an administrative addition. Previously the BIE program was offering this subject area as one 6 credit course. This proposal creates two 3 credit courses to allow greater flexibility for students. The original course (ECON 308) will be kept active for use in the Spring/Summer sessions.</i></p> <p><b>Rationale for Proposed Change:</b>  BIE students are currently required to take ECON308 (6) Intermediate Microeconomic Analysis. The year-long course design causes difficulty with instructor(s) scheduling, teaching, student transfer, registration, evaluation, and concession. Therefore we propose to split the 6-credit course into two 3-credit courses, both of which BIE students will be required to take (ECON315 and 316 as proposed). The two new courses will cover all the contents in the original ECON308 (6). The proposed change will in no way reduce the quality and rigor of the BIE curriculum.</p> <p> <b>Not available for Cr/D/F grading (undergraduate courses only)</b></p> <p><b>Rationale for not being available for Cr/D/F:</b> Course is restricted to students in the BIE for whom it is a core requirement.</p>



	It is used in calculation of student core average to determine continuation eligibility and graduation standing and cannot be taken without a grade.
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**ENGL: English Department (New)****ENGL 390 (3-6) d Theory: Life Narratives**

<b>Category: (1) Faculty:</b> Arts <b>Department:</b> English <b>Faculty Approval Date:</b> April 19, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2019	<b>Acknowledged:</b> March 15, 2017 <b>Contact Person:</b> Laurie McNeill/Scott MacKenzie and Lois Nightingale <b>Email:</b> <a href="mailto:laurie.mcneill@ubc.ca">laurie.mcneill@ubc.ca</a> ; <a href="mailto:macscott@mail.ubc.ca">macscott@mail.ubc.ca</a> ; <a href="mailto:Arts.Curriculum@ubc.ca">Arts.Curriculum@ubc.ca</a> ; <b>URL:</b> N/A
<b>Proposed Calendar Entry:</b>  <b>ENGL 390 (3-6) d Theory: Life Narratives</b> Analysis of modes of self-representation through theoretical, critical, historical, and methodological frameworks.  <i>Prerequisite:</i> (Pre-requisites must be met by the first day of class or students will be withdrawn). Third-year standing; and 3 credits of 100- and/or 200-level English or one of WRDS 150 or 350; ASTU 100 or 101; ARTS 001. Recommended: 6 credits of 100- and/or 200-level English and/or writing courses.	<b>Type of Action:</b> New Course  <b>Rationale for Proposed Change:</b> This course, <b>Theory: Life Narratives</b> , contributes to this curriculum revision by acknowledging the significant place of autobiographical texts in literary studies and of autobiography studies as a robust field within the discipline. The addition of this course is another avenue through which to diversify the literatures and the literary subjects taught in the department, and address student interest in these genres.  This course forms part of an extensive revision by the Department of English to its undergraduate curriculum. New course offerings reflect current developments in the discipline of English Literary Studies; they respond vigorously to faculty teaching interests, allowing the development of new curricular approaches with enough flexibility to accommodate the ongoing transformation of our strategy for achieving the pedagogical goals articulated in our departmental learning outcomes;; and they articulate relevance to student needs, preparing learners to engage the contemporary world with critical acuity and robust cultural literacy.

**PHIL: Philosophy Department*****PHIL 351 (3) Philosophical Perspectives on Cognitive Systems Research***

<b>Category: (1) Faculty:</b> Arts <b>Department:</b> Philosophy <b>Faculty Approval Date:</b> April 19, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2018	<b>Rec'd:</b> 2018 Mar 01 <b>Contact Person:</b> Lois Nightingale for Paul Bartha <b>Phone:</b> <b>Email:</b>
<b>Proposed Calendar Entry:</b>  <b>PHIL 351 (3) Philosophical Perspectives on Cognitive Systems Research</b>  Philosophical exploration of questions and theories arising from research into the mind, as conducted in psychology, linguistics, and computer science.  <i>Prerequisites:</i> 3 credits selected from any of PHIL 211, 212, 220, 230, 235, 240, 250, 260, or COGS 200	<b>URL:</b>  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New Course  <b>Rationale for Proposed Change:</b>  This course introduces an alternative route – in addition to PHIL 451 – by which students can make a philosophical study of the mind. Whereas the existing Philosophy of Mind course tends to focus on questions from the western and eastern philosophical traditions, this new course would focus on questions arising in the course of current scientific research.  The course will be of particular interest to those students in the cognitive systems program (who have wide ranging knowledge of such research).

# Faculty of Arts

## Curriculum Committee Report Category **ONE** Proposals - UNDERGRADUATE

**Faculty of Arts Meeting: May 17, 2018**  
**Forwarded to Senate Offices: June 13, 2018**

Arts Curriculum Committee Members:

Christina Hendricks, *Chair*

Silvia Bartolic  
Katherine Bowers  
Stefania Burk *ex officio, voting*  
Christine D'Onofrio  
Nisha Malhotra

Keith Bunnell *ex-officio*  
Nancy Campbell *ex-officio*  
Heidi May *ex-officio*  
Lois Nightingale *ex officio*

## THE UNIVERSITY OF BRITISH COLUMBIA

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**UNDER Graduate Proposals****Anthropology Department: ANTH****ANTH 203 (3) Anthropology of Drugs**

<b>Category: (1) Faculty: Arts</b> <b>Department: Anthropology</b> <b>Faculty Approval Date: May 17, 2018</b> <b>Effective Session (W or S): W</b> <b>Effective Academic Year: 2018</b>	<b>Rec'd: Feb 8, 2018</b> <b>Contact Person: Vinay Kamat for Shaylih Muehlmann (course author)</b> <b>Email: <a href="mailto:Arts.Curriculum@ubc.ca">Arts.Curriculum@ubc.ca</a>;</b>
<b>Proposed Calendar Entry:</b>  <b>ANTH 203 (3) Anthropology of Drugs</b> <b>Illicit and/or licit drugs through historical, political, cultural and societal examples.</b>	<b>URL: "ANTH"</b>  <b>Present Calendar Entry:</b> N/A <b>Type of Action:</b> New course (Please create for 2018W)  <b>Rationale for Proposed Change:</b>  The "war on drugs" is one of the most important contemporary causes of violence and suffering across the world and remains one of the most heatedly contested issues of the 21 <sup>st</sup> century. And the use of legal and illegal substances called "drugs" is culturally and socially important in countless settings across the world. Yet UBC does not offer courses focused on this important and timely topic. This course will complement existing courses that

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	examine anthropological approaches to health and illness, namely ANTH 227 (Introduction to Medical Anthropology) and ANTH 427 (Topics in Medical Anthropology). In particular, it will offer students critical tools to denaturalize the very idea of what constitutes a “drug” and to understand the legal, political, cultural, gender, and racialized dimensions of the use of drugs in the contemporary world and, in particular, of the “war on drugs.”
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**Art History and Visual Art: ARTH*****ARTH 309 (3) Arts of Africa and African Diasporas***

<b>Category:</b> (1) Faculty: Arts <b>Department:</b> AHVA <b>Faculty Approval Date:</b> May 17, 2018 <b>Effective Session (W):</b> 2019 <b>Effective Academic Year:</b> S	<b>Date:</b> February 27, 2018 <b>Contact Person:</b> Greg Gibson <b>Phone:</b> 604-822-1282 <b>Email:</b> <a href="mailto:greg.gibson@ubc.ca">greg.gibson@ubc.ca</a> (on behalf of Nuno Porto)
<b>Proposed Calendar Entry:</b>  ARTH 309 (3) Arts of Africa and the African Diasporas  Comparative exploration of art practices and their relationship to colonial and postcolonial histories.	<b>URL:</b> “ARTH”  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New course  <b>Rationale for Proposed Change:</b> This course will further develop our course offerings and meet a long-standing need for a 300-level undergraduate lecture course focused on African arts and the diaspora.

**English Language and Literature: ENGL*****ENGL 382 (3-6) d Theory: Anti-/De-/Post-Colonization***

<b>Category:</b> (1) Faculty: Arts <b>Department:</b> English <b>Faculty Approval Date:</b> May 17, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2019	<b>Acknowledged:</b> March 16, 2017 <b>Contact Person:</b> Lorraine Weir and Lois Nightingale <b>Email:</b> <a href="mailto:Lorraine.Weir@ubc.ca">Lorraine.Weir@ubc.ca</a> ; <a href="mailto:Arts.Curriculum@ubc.ca">Arts.Curriculum@ubc.ca</a> ;
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<p><b>Proposed Calendar Entry:</b>  <b>ENGL 382 (3-6) d Theory: Anti-/De-/Post-Colonization</b></p> <p>Theoretical work concerned with confronting, resisting and overcoming various forms of colonialism and globalization.</p> <p><i>Prerequisite:</i> (Pre-requisites must be met by the first day of class or students will be withdrawn). Third-year standing; and 3 credits of 100- and/or 200-level English or one of WRDS 150 or 350; ASTU 100 or 101; ARTS 001. Recommended: 6 credits of 100- and/or 200-level English and/or writing courses.</p>	<p><b>Type of Action:</b>  New course</p> <p><b>Rationale for Proposed Change:</b></p> <p>This course, <b>Theory: Anti-/De-/Post-Colonization</b>, will draw its focus from various significant movements toward decolonization among Indigenous, diasporic and colonized populations around the globe. It will focus on thinking through practices of resistance and resurgence, addressing responses to colonial dispossession that involve the recovery of traditional knowledge systems, language revitalization and direct action. Students will discover, by engaging with contemporary theoretical and political discourse, how their own senses of citizenship and belonging are both challenged and revitalized by global struggles for recognition.</p> <p>This course comprises one of a suite of “Theory” courses offers faculty and students opportunities to engage with significant contemporary critical practices, with emphases on the conceptual. There is no single methodology, ideology or approach that characterizes literary and cultural studies in English, and no single course can accommodate our discipline’s theoretical and methodological work. These courses organize the study of theory in manageable, viable and productive trajectories that reflect and accommodate the conceptual plurality of teaching and research in our current curriculum.</p> <p>This course forms part of an extensive revision by the Department of English to its undergraduate curriculum. New course offerings reflect current developments in the discipline of English Literary Studies; they respond to faculty teaching interests, allowing the development of new curricular</p>
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	approaches with enough flexibility to accommodate the ongoing transformation of our strategy for achieving the pedagogical goals articulated in our departmental learning outcomes; and they articulate relevance to student needs, preparing learners to engage the contemporary world with critical acuity and cultural literacy.
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*Emphasis in Language and Literature*

<b>Category: (1) Faculty:</b> Arts <b>Department:</b> English Language and Literatures <b>Faculty Approval Date:</b> May 17, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2019	<b>Date:</b> April 10, 2018 <b>Contact Person:</b> Alexander Dick, Associate Professor and Chair, Majors Program, Department of English <b>Phone:</b> 822-4225 <b>Email:</b> Alex.Dick@ubc.ca
<b>Proposed:</b>  Major in English, <b>Emphasis Language and Literature</b>	<b>Type of Action:</b> <ul style="list-style-type: none"> <li>• Create a new emphasis.</li> <li>• This new emphasis will be available to any undergraduate student specializing in a “Major in English.”</li> </ul> <p>Note: Presently the Academic Records reflect the following,</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>Bachelor of Arts (UBC Vancouver) - Year 3 - Major in English, Emphasis Literature</b> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <b>Bachelor of Arts (UBC Vancouver) - Year 3 - Major in English, Emphasis Language</b> </div> <p><b>Rationale:</b>          All students specializing within the Major in English must select an emphasis. At present there are two options to select from: Emphasis Language or Emphasis English.</p> <p>Students have requested an option that allows them to focus on both Language and Literature courses. This new emphasis offers them this opportunity.</p>
<b>Calendar Navigation:</b> <a href="#">Faculties, Colleges, and Schools &gt; The</a>	URL; <a href="http://www.calendar.ubc.ca/vancouver/index.html">http://www.calendar.ubc.ca/vancouver/index.html</a>

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<p><a href="#">Faculty of Arts</a> &gt; <a href="#">Bachelor of Arts</a> &gt; <b>English</b></p> <p><b>Proposed Calendar Entry:</b></p> <p>English ...</p> <p>Major in English</p> <p>Admission</p> <p>Students <b>must</b> declare <b>an emphasis in either</b> Language, Literature, <b>or Language and Literature</b>. Students should consult the <a href="#">English Department website</a> or speak with an advisor for more information about these options and the <a href="#">admissions process</a>.</p> <p>Literature Emphasis Program ...</p> <p>Language Emphasis Program ...</p> <p><b>&lt;b&gt;Language and Literature Emphasis Program&lt;b&gt;</b></p> <p><b>&lt;Lower Level Requirements&lt;b&gt;</b></p> <ul style="list-style-type: none"> <li>• 6 credits of 100-level English: OR ARTS ONE; OR 6 credits of ASTU 100; OR 3 credits of ASTU 101 and 3 credits of 100-level English; OR 3 credits of WRDS 150/350 and 3 credits of 100-level English.</li> <li>• 6 credits: ENGL 220 and ENGL 229</li> </ul> <p><b>&lt;b&gt;Upper-level Requirements&lt;b&gt;</b></p> <p><b>The combined Language and Literature Emphasis Program requires students complete at least 30 credits in courses numbered 304 or higher. Students must complete:</b></p>	<p><a href="#">x.cfm?tree=12,197,282,71</a></p> <p><b>Present Calendar Entry:</b></p> <p>English ...</p> <p>Major in English</p> <p>Admission</p> <p>Students <del>may either</del> declare a Language <del>or a Literature emphasis or take a program of courses combining both emphases</del>. Students should consult the <a href="#">English Department website</a> or speak with an advisor for more information about these options and the <a href="#">admissions process</a>.</p> <p>Literature Emphasis Program ...</p> <p>Language Emphasis Program ...</p>
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<ul style="list-style-type: none"> <li>• <b>15 credits in Language:</b> <ul style="list-style-type: none"> <li>○ ENGL 310, 330, and 331</li> <li>○ 6 additional credits selected from ENGL 307-331, or 340</li> </ul> </li> <li>• <b>12 credits in Literature:</b> <ul style="list-style-type: none"> <li>○ 3 credits selected from ENGL 343-369 (Literature Groups A or B)</li> <li>○ 3 credits selected from ENGL 462-480 (Literature Group D)</li> <li>○ 6 credits selected from courses in Literature Groups A-D. A course in Canadian Literature is recommended.</li> </ul> </li> <li>• <b>3 credits of Majors Seminar:</b> <ul style="list-style-type: none"> <li>○ either ENGL 489 (Language) or ENGL 490 (Literature)</li> </ul> </li> </ul> <p><b>Note:</b> <i>Students are required to seek Majors Advising before registering for upper-level courses.</i></p> <p>Honours in English ...</p>	<p>Honours in English ...</p> <p><b>Type of Action:</b> Include the new Language and Literature Emphasis in the calendar.</p> <p>Note: The Language and Literature groups referred to are already listed on the calendar page.</p> <p><b>Rationale:</b> In the last several years, developments in both scholarship and pedagogy toward more diverse and inclusive curricula and the increasingly competitive field of offerings available to students across the disciplines at UBC have inspired extensive revisions in the department's curriculum, approach, and identity. In meeting these challenges, the department has sought to maintain its distinctive profile.</p>
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	This new emphasis combines the intellectual vigor and skills development of both areas, something students have been requesting in recent years.
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Faculty of Arts, Department of English Language and Literatures  
Major in English

**Proposed new “Emphasis Language and Literature”**

## Executive Summary:

### Background:

Since 1974, UBC English has had the distinction of being the only department of its kind in Canada to offer two emphases in its major program, one in **literature** and one in **language**. Working with a wide range of historical and contemporary materials, in a variety of media, and using many different theoretical approaches, the English department’s world-renowned literature faculty challenge their students, as its program objectives make clear, to “articulate the relevance of literary scholarship to the strengthening of individual capacity, to interdisciplinary thinking, and to life beyond the classroom.” Our language faculty likewise “articulate the connections between language and cognition, between language and action, and between language and society” to students through the application of “structural, generative, discourse-analytic, sociolinguistic, lexicographical, and cognitive perspectives” and theories.

In the last several years, developments in both scholarship and pedagogy toward more diverse and inclusive curricula and the increasingly competitive field of offerings available to students across the disciplines at UBC have inspired extensive revisions in the department’s curriculum, approach, and identity. In meeting these challenges, the department has sought to maintain its distinctive profile. It has a new name: *The Department of English Language and Literatures*. As of 2019, it will offer an array of new courses, especially in areas that straddle the goals and outcomes of both fields including literary and linguistic theory, diasporic writing, media studies, and indigenous literatures. **The next step in this ongoing revision process is to introduce formally into the UBC calendar a new, combined emphasis within our English major program: Language and Literature.** This emphasis combines the intellectual vigor and skills development of both areas.

In 2015, the department’s majors committee accepted a proposal to develop a new emphasis to combine the approaches, pedagogies, and methodologies of our language and literature programs. The combined program has been offered to students as a “pilot” since 2016. In its first year, it attracted 25 students, exceeding the number of new majors in the language program. That number has increased to 52 students in 2017. The Department is confident that this combined program will continue to attract new students to English and, once approved, will become a vital part of the Faculty of Arts curriculum.

### Rationale:

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1. The new program is consistent with the change of the Department name and ethos to the *Department of English Language and Literatures*. In the same way that our department is unique in Canada for its double emphasis on literary and linguistic research (as reflected in our new name), the combined language and literature program will embody the distinctive strength and diversity of our department and our faculty.
2. The new program will increase the size of the major. Some students are attracted to both literature and language streams and do not want to limit their program or courses to either area. Students are also excited about exploring the ways that the methodologies and outlooks of literature and language study can overlap.
3. The new program opens prospects for students' careers. Current and prospective offerings in the literature and language programs offer our students many opportunities to fashion their majors to intellectual goals and career ambitions. Combining the linguistic orientation of the language program and the cultural-historical orientation of the literature program will provide these students a strong base for careers in law, media, marketing, or education that demand expertise in both.

### **Program Objectives:**

After completing the Major in English, Emphasis Language and Literature, students will be able to

- interpret critically the linguistic dynamics and features of a range of literary and non-literary texts, genres, and media, along with their historical, psychological, and social implications
- evaluate scholarship by both literary and linguistic researchers, and integrate their scholarly findings and approaches into original critical interventions
- access a portable set of concepts of and approaches to both linguistic (structural, discourse-analytic, lexicographic, cognitive) and literary (historical, political, theoretical) analysis
- appreciate the particular points of contact and dissent between English literature and language scholars and develop strategies for recognizing and adapting those disputes to productive research
- explain the role that linguistic and literary choices play in achieving communicative and/or artistic goals in a range of discourses.
- explicate creative strategies used in a range of expressive contexts (literary, textual, colloquial, etc.) and different forms of creativity in fiction and non-fiction
- establish a critical claim grounded in disciplinary discourses and substantiate that claim with evidence from several sources, methodologies, data sets, and/or texts
- prepare written and oral work that meets the analytical, stylistic, and formal expectations of both literature and language scholarship and employs methods of close reading, literary and linguistic theory, archival and/or corpus research.

### **Student Consultations:**

In March of 2018, we conducted an informal poll of students currently enrolled in our pilot language and literature program about what attracted them to the program, its strengths and weaknesses, and the advantages it will give them after graduation. The response was entirely

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positive. On what attracted them to the program, the students explained that they were drawn to the program's "comprehensive" diversity. One student told us that she had intended to major in linguistics or speech sciences but did not want to abandon one of her "lifelong passions" and enrolled in the English language and literature emphasis (pilot) instead. Another student explained that she "wanted to gain a more holistic background of English as well as a wider appreciation and set of skills"; yet another said that she "decided to take the combined emphasis because I want flexibility for my future." The students all saw opportunities for "diverse learning" and "skills development" in the new program.

In the students' minds, the English language and literature emphasis is, as one said, "strong" not only "because it combines the best of both worlds" of literary and linguistic analysis but also because the program "enhance[s] the learning of both emphases." One explained that her "interest in literature analysis has been made more complex now that I can recognize rhetorical patterns and linguistic features, and my English language classes are exciting because they have given me the tools to dissect grammar of not only English, but other language structures as well!" Most of the students who responded to the survey told us that they were planning to apply to education programs after completing their undergraduate degrees and that this program will be an especially advantageous foundation for that career path. As one student wrote, "this program will be beneficial for me in the working field as a teacher because I will have touched on both the grammatical and literary aspects of English." More broadly, though, one student reported that her "practice... in writing analytical essays for both language and literature courses will be useful in establishing a solid foundation for developing both creative and technical writing skills." Another said that the program will "equip me to solve problems and understand issues with a range of linguistic and analytical skills." Overall, the students recognized and appreciated the intellectual and the professional benefits of the program.

*Note: The pilot program was offered on an individual basis. Students were required to select either the Literature or Language emphasis with permission to replace elective coursework with courses from the alternate emphasis. This was managed with permission and advice required from the English Major Advisor.*

**Timing:**

Students will begin graduating from this new Emphasis in Language and Literature as early as May 2019, but it would not appear in the Calendar until the 2019-20 Academic Year.

**Program Requirements:**

The English Major, Emphasis Language and Literature, will be structured similarly to our existing Language and Literature emphases. Students will need the same first-year requirements as all English majors. They will also complete both of the two courses, *ENGL 200 Principles of Literary Studies* and *ENGL 229 Topics in the Study of Language and/or Rhetoric*, individually required of English literature and language emphases: if students decide at the end of 2<sup>nd</sup>-year that they would rather enroll in one of either the literature or language emphasis instead of the combined specialization, they will be able to do so without penalty or delay. Upper-level requirements blend those of our language and literature emphases and feature the core courses of the language program with a broad set of historical and contemporary courses from the literature program. Students in the combined emphasis will also take 12 credits of ENGL electives distributed evenly between language and literature courses and complete **one** majors seminar, choosing to do this seminar in **either** literature or language.

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## *Lower Level Requirements*

- 6 credits of 100-level English: OR Arts ONE; OR 6 credits of ASTU 100; OR 3 credits of ASTU 101 and 3 credits of 100-level English; OR 3 credits of WRDS 150/350 and 3 credits of 100-level English
- 6 credits: ENGL 200 and ENGL 229

## *Upper-level Requirements*

The Combined Language and Literature Emphasis Program requires that students complete at least 30 credits in ENGL courses numbered 304 or higher. They must complete:

1. Language Courses (15 credits)
  - a. 9 credits: ENGL 310, ENGL 330, and ENGL 331
  - b. 6 credits selected from ENGL 307-331, 340
2. Literature Courses (12 credits)
  - a. 3 credits selected from either
    - Literature Group A Medieval and Early-Modern Literature; or,
    - Literature Group B 18<sup>th</sup>- and 19<sup>th</sup>-Century Literature
  - b. 3 credits selected from
    - Literature Group D Modern and Contemporary Literature
  - c. 6 credits selected from courses in Literature Groups A – D. A course in Canadian Literature is recommended.
- 
3. Majors seminar (3 credits)
  - a. either ENGL 489 (Language) or ENGL 490 (Literature)

The Literature Groups appear on the English calendar page under the *Emphasis in Literature*. They are:

- A. **Medieval and Early-Modern Literature:** ENGL 343, 344, 346, 347, 348, 349, 354
- B. **18th- and 19th-Century Literature:** ENGL 357, 358, 359, 362, 364, 369
- C. **Genre and Theory:** ENGL 332, 402, 405, 406, 407, 408, 409, 412, 417, 418, 419
- D. **Modern and Contemporary Literature:** ENGL 462, 464, 466, 468, 470, 472, 474, 476, 478, 480

The Language Groups appear on the English calendar page under the *Emphasis in Language*. They are:

1. **History of the English Language:** ENGL 326, 340, 343, 344, 346, 347, 348, 352
2. **Structure of the English Language:** ENGL 321, 323, 326, 328
3. **Approaches to Discourse:** ENGL 308, 312, 322, 326
4. **Rhetorical Theory:** ENGL 307, 308, 309, 310, 311

## **Consultations:**

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At this time the Department has not sought consultations. This emphasis is created as a merger of our existing Language and Literature emphasis. We see this request as more administrative in nature. However, consultations may be gathered if a need is seen.

<b>Category: [1] Faculty: Arts</b> Department: History Faculty Approval Date: 2018 Feb 15 Effective Session (W or S): W Effective Academic Year: 2018W	<b>Date:</b> 30 October 2017 <b>Contact Person:</b> Lois Nightingale <b>Email:</b> <a href="mailto:Arts.Curriculum@ubc.ca">Arts.Curriculum@ubc.ca</a> ;
<b>Proposed Calendar Entry:</b>  <b>HIST 240 (3) Health, Illness and Medicine I: From the Ancient World to the Early Modern Period</b>  History of western medicine, from the Ancient World to the Enlightenment, with a focus on social and cultural ideas surrounding the body, health, and disease, and the development of medical institutions.	<b>URL: "HIST"</b>  <b>Present Calendar Entry:</b> None  <b>Type of Action:</b> New course  <b>Rationale for Proposed Change:</b> To date UBC does not offer a chronologically structured survey and introduction to the history of western medicine.  This course adds to the Department of History and the University's offerings in three important ways:  1) It will be an important component of the Department's developing curriculum in the history of science and medicine  2) As a 200 level survey, this course should be of great interest to students in History, the humanities and social sciences, but also to students in medicine, nursing, and pharmacy; the health and life sciences; and perhaps the pure and applied sciences, looking for a stimulating elective in a relevant field  3) This course is part of a foundational sequence in the history of health, illness and medicine. It is also integrated in the curricula of three interdisciplinary programs at UBC: the Health & Society (HESO) Minor, the History and Philosophy of Science Major, and the Science Studies Minor.
<b>Category: 1 Faculty: Arts</b>	<b>Date:</b> 30 October 2017

<p>Department: History  Faculty Approval Date: Feb 15, 2018  Effective Session (W or S): W  Effective Academic Year: 2018</p>	<p><b>Contact Person:</b> Lois Nightingale  <b>Phone:</b>  <b>Email:</b> <a href="mailto:Lois.Nightingale@ubc.ca">Lois.Nightingale@ubc.ca</a>;</p>
<p><b>Proposed Calendar Entry:</b></p> <p>HIST 241 (3) Health, Illness and Medicine II: The Modern World from 1700 to the Present</p> <p>Western medicine from 1700 to the present, with a focus on social and cultural ideas surrounding the body, health and disease, and the development of medical institutions.</p>	<p><b>URL:</b></p> <p><b>Present Calendar Entry:</b> None</p> <p><b>Type of Action:</b> New course</p> <p><b>Rationale for Proposed Change:</b></p> <p>To date UBC does not offer a chronologically structured survey and introduction to the history of western medicine.</p> <p>This course adds to the Department of History and the University's offerings in three important ways:</p> <ol style="list-style-type: none"> <li>1) It will be an important component of the Department's developing curriculum in the history of science and medicine</li> <li>2) As a 200 level survey, this course should be of great interest to students in History, the humanities and social sciences, but also to students in medicine, nursing, and pharmacy; the health and life sciences; and perhaps the pure and applied sciences, looking for a stimulating elective in a relevant field</li> <li>3) This course is part of a foundational sequence in the history of health, illness and medicine.</li> </ol>



## UBC Curriculum Proposal Form Change to Course or Program

**Category: (1)**

<p><b>Faculty:</b> Education  <b>UNIT:</b> ECED  <b>Faculty Approval Date:</b> March 29, 2018  <b>Effective Session (W or S):</b> W  <b>Effective Academic Year:</b> 2018</p>	<p><b>Date:</b> November 20, 2017  <b>Contact Person:</b> Dr. Margot Filipenko  <b>Phone:</b> 7 - 5680  <b>Email:</b> margot.filipenko@ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>ECED 490 (2) Early Childhood Education Practicum &amp; Seminar I</b></p> <p><b>Pass/Fail. This course is not eligible for Credit/D/Fail grading</b></p> <p><b>Prerequisites: All of ECED 400 and 438.</b></p> <p><i>Supporting Document: ECED Practica-ECED-490-491-495</i></p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New course</p> <p><b>Rationale for Proposed Change:</b> In order for students in the Education minor or an Education diploma with a specialization in early childhood education, to qualify for certification as an early childhood educator (ECE) with the Ministry of Children and Families, they must complete a total of 425 hours of practicum experience. Three practica, which are organized in a developmental progression (ECED 490, 491, and 495), will achieve this total.</p> <p>During ECED 490 (90 hours in total), early childhood educator (ECE) candidates engage in observation, interaction, and reflection with limited care and instructional duties. The focus for the ECE candidates is on developing experiential knowledge of young children and how they learn and develop across all domains; building positive relationships with children; and cultivating professional understandings toward early learning and care, teaching, learning, inquiry and reflection.</p> <p><b>X      Not available for Cr/D/F grading (undergraduate courses only)</b></p>

	<p><b>Rationale for not being available for Cr/D/F:</b> This course is part of a set of three practica and seminars designed to be taken as a group, following a developmental progression.</p> <p><input checked="" type="checkbox"/> <b>Pass/Fail or</b> <input type="checkbox"/> <b>Honours/Pass/Fail grading</b></p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>ECED 491 (3) Early Childhood Education Practicum &amp; Seminar II</b></p> <p><b>Pass/Fail. This course is not eligible for Credit/D/Fail grading.</b></p> <p><b>Prerequisite: All of ECED 490, 400, 401, 438, and EPSE 406</b></p> <p><i>Supporting Document: ECED Practica-ECED-490-491-495</i></p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New course</p> <p><b>Rationale for Proposed Change:</b></p> <p>In order for students in the Education minor or an Education diploma with a specialization in early childhood education, to qualify for certification as an early childhood educator (ECE) with the Ministry of Children and Families, they must complete a total of 425 hours of practicum experience, including observation and seminars. Three practica, which are organized in a developmental progression (ECED 490, 491, and 495), will achieve this total.</p> <p>ECED 491 – 140 hours in total (4-week practicum) – is a sustained period of apprenticeship in professional practice that includes collaborating with mentors in caring for young children, the intentional planning of early learning experiences, supporting early learning, and observation and documentation of learning. Central to this experience are the questions: How do diverse children develop and learn across</p>

	<p>time? How do ECEs develop positive and supportive relationships with children and families? How do ECEs use observation and pedagogical documentation and narration to inform their practice?</p> <p><b>X Not available for Cr/D/F grading (undergraduate courses only)</b></p> <p><b>Rationale for not being available for Cr/D/F:</b></p> <p>This course is part of a set of three practica and seminars designed to be taken as a group, following a developmental progression.</p> <p><b>X Pass/Fail or Honours/Pass/Fail grading</b> <input type="checkbox"/></p>
<p><b>Proposed Calendar Entry</b></p> <p><b>ECED 495 (3) Early Childhood Education Practicum &amp; Seminar III</b></p> <p><b>Pass/Fail. This course is not eligible for Credit/D/Fail grading.</b></p> <p><b>Prerequisite: All of ECED 490, 491, 400, 401, 406, 407, 438, EPSE 406</b></p> <p><i>Supporting Document: ECED Practica-ECED-490-491-495</i></p>	<p><b>URL:</b> N/A</p> <p><b>Present Calendar Entry:</b> N/A</p> <p><b>Type of Action:</b> New course</p> <p><b>Rationale for Proposed Change:</b></p> <p>In order for students in the Education minor or an Education diploma with a specialization in early childhood education, to qualify for certification as an early childhood educator (ECE) with the Ministry of Children and Families, they must complete a total of 425 hours of practicum experience, including observation and seminars. Three practica (ECED 490, 491, and 495) will achieve this total. The practica are organized in a developmental fashion.</p> <p>The ECED 495 field experience – 195</p>

hours in total (6-week practicum)– is a sustained period of apprenticeship in professional practice in which ECE candidates take on increasing responsibilities for young children's early learning and care, finding ways to address the care and learning needs of all children, and the observation and pedagogical documentation and narration for diverse children across contexts.

**X Not available for Cr/D/F grading (undergraduate courses only)**

**Rationale for not being available for Cr/D/F:**

This course is part of a set of three practica and seminars designed to be taken as a group, following a developmental progression.

**X Pass/Fail or Honours/Pass/Fail grading**



## UBC Curriculum Proposal Form Change to Course or Program

### Category: (1)

<b>Faculty:</b> Education <b>Department:</b> Kinesiology <b>Faculty Approval Date:</b> March 29, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2018	<b>Date:</b> April 16, 2018 <b>Contact Person:</b> Paul Kennedy <b>Phone:</b> 604-822-9204 <b>Email:</b> paul.kennedy@ubc.ca
<b>Proposed Calendar Entry:</b>  <b>KIN 265 (3) Nutrition, Physical Activity, and Health</b>  Study of nutrition and its application to physical activity and health. Macro- and micronutrient classification and recommended daily intakes, their digestion, functions in the body and their role in supporting physical activity and health will be discussed. [3-0]  Prerequisites: Completion of KIN 190 and KIN 191 (or similar), and second-year standing	<b>URL:</b> N/A  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New Course  <b>Rationale for Proposed Change:</b> Students in the BKIN degree program take courses in anatomy and physiology, exercise physiology, exercise prescription, and contemporary health issues. These courses deal with, but do not cover in detail, concepts relating to nutrition and metabolism. By adding KIN 265 Nutrition, Physical Activity, and Health to the curriculum, students will learn important foundational concepts in nutrition that are applied in other KIN courses. KIN 265 will also serve as an important prerequisite for the KIN 489a seminar course in Sports Nutrition.  <input type="checkbox"/> <b>Not available for Cr/D/F grading (undergraduate courses only)</b>

## UBC Curriculum Proposal Form Change to Course or Program

### Category: (1)

<b>Faculty:</b> Education <b>Department:</b> Kinesiology <b>Faculty Approval Date:</b> March 29, 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2018	<b>Date:</b> April 16, 2018 <b>Contact Person:</b> Paul Kennedy <b>Phone:</b> 604-822-9204 <b>Email:</b> paul.kennedy@ubc.ca
<b>Proposed Calendar Entry:</b>  KIN 357 (3) Laboratory Investigations in Neuomechanical Kinesiology  Integration and application of laboratory principles and techniques for experimental investigations of topics in neuomechanical kinesiology, including biomechanics, motor behaviour, and neurophysiology. [1-2]  Prerequisites: Restricted to students registered in the BKIN program, third-year standing.	<b>URL:</b> N/A  <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> New Course  <b>Rationale for Proposed Change:</b> Students in the BKIN program have the option of taking courses in motor learning and control (330), biomechanics (KIN 351), and neurophysiology (389). Although these courses have laboratory components, due to the high enrolment, laboratory time has decreased and most of the activities have been changed to demonstrations. The proposed KIN 357 course will provide students with an opportunity to gain hands-on experience with tools and techniques related to neuomechanical kinesiology. Each lab activity is designed around a basic research question drawn from topics within the areas of neuomechanical kinesiology, which will expose students to the practical and theory applications to the field of study.  <input type="checkbox"/> <b>Not available for Cr/D/F grading (undergraduate courses only)</b>



<p><b>Proposed Calendar Entry:</b></p> <p><b>MINE 586 (3)- Advanced Mine Waste Management</b></p> <p>Advanced geotechnical, hydrological, and water management aspects of mine waste management.</p>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE">http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE</a></p> <p><b>Present Calendar Entry:</b> None.</p> <p><b>Type of Action:</b> create new course.</p> <p><b>Rationale for Proposed Change:</b>          The recent attention to tailings management initiated by the Mount Polley Tailings Dam Failure and the subsequent catastrophic failure in Brazil at Samarco has created a demand for more advanced course work for engineers in Mine Waste Management.          This course has been offered for several years under MINE 590Q.</p> <p><input checked="" type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>
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<p><b>Proposed Calendar Entry:</b></p> <p><b>MINE 587 (3) Advanced Mine Site Management</b></p> <p>Advanced mine site management topics including site and corporate governance and responsibility for mine waste facilities, specifically tailings; the role and responsibilities of the Engineer of Record; geochemistry of mine waste and mine closure realities.</p>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE">http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE</a></p> <p><b>Present Calendar Entry:</b> None.</p> <p><b>Type of Action:</b> New course.</p> <p><b>Rationale for Proposed Change:</b>  The recent attention to tailings management initiated by the Mount Polley Tailings Dam Failure and the subsequent catastrophic failure in Brazil at Samarco has created a demand for more advanced course work for engineers in Mine Waste Management. This new course will examine mine site management topics associated with mine waste and tailings.</p> <p><input checked="" type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>
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<p><b>Proposed Calendar Entry:</b></p> <p><b>MINE 588 (3)- Risk Assessment for Mine Waste Management</b></p> <p>Risk assessment and management topics including risk assessment methodologies, risk management, and decision-making under risk</p>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE">http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE</a></p> <p><b>Present Calendar Entry:</b> None.</p> <p><b>Type of Action:</b> New course creation</p> <p><b>Rationale for Proposed Change:</b>  The recent attention to tailings management initiated by the Mount Polley Tailings Dam Failure and the subsequent catastrophic failure in Brazil at Samarco has created a demand for more advanced course work for engineers in Mine Waste Management. This new course</p>
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	<p>will examine risk in the context of mine waste management.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>
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<p><b>Proposed Calendar Entry:</b></p> <p><b>MINE 589 (3)- Mine Waste Management Case Studies</b></p> <p>Case study analysis including design, construction, operations and closure of mine waste facilities.</p>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE">http://www.calendar.ubc.ca/vancouver/courses.cfm?page=code&amp;code=MINE</a></p> <p><b>Present Calendar Entry:</b> None.</p> <p><b>Type of Action:</b> New course.</p> <p><b>Rationale for Proposed Change:</b>  The recent attention to tailings management initiated by the Mount Polley Tailings Dam Failure and the subsequent catastrophic failure in Brazil at Samarco has created a demand for more advanced course work for engineers in Mine Waste Management. This new course will examine mine waste management case studies.</p> <p><input type="checkbox"/> <b>Not available for Cr/D/F grading</b></p>
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## UBC Curriculum Proposal Form Change to Course or Program

Category: 1

Faculty: Law Department: Graduate Faculty Approval Date: April 19, 2018 Effective Session (W or S): W Effective Academic Year: 2018	Date: April 11 2018 Contact Person: Matisse Emanuele Phone: 604 827 0389 Email: emanuele@allard.ubc.ca
Proposed Calendar Entry:  <b>LAW 543 (1-3) d Topics in Public Law</b> Credit will only be granted for one of LAW 543 or LAW 343.	Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a>  Type of Action: Create new course and add cross-listing  Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.
Proposed Calendar Entry: <b>LAW 539 (1-3) d Topics in Constitutional Law</b> Credit will only be granted for one of LAW 349 or LAW 539	Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a>  Type of Action: Create new course and add cross-listing  Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.
Proposed Calendar Entry: <b>LAW 558 (1 - 3) d Topics in First Nations Law</b> Credit will only be granted for one of LAW 358 or LAW 558.	Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a>  Type of Action:



	<p>Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 559 (3/4) d Family Law</b></p> <p>The law relating to family relationships, including the law of marriage, divorce, maintenance, custody, matrimonial property, and related matters. Credit will only be granted for one of LAW 359 or LAW 559.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 577 (3) Immigration Law</b> Admission of immigrants into Canada; refugee protection; practice and procedure before immigration tribunals and the courts Credit will only be granted for one of LAW 577 or LAW 377.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 578 (3) Refugee Law</b></p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p>



<p>International and Canadian refugee law; the Refugee Convention and its implementation in Canada; the practice of refugee law in Canadian courts and tribunals. Course content does not duplicate Law 377. This course is not eligible for Credit/D/Fail grading. Credit will only be given to one of LAW 578 or LAW 378.</p>	<p><a href="#">urses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 586 (3) Sustainable Development Law</b> The linkages, intersections, and tensions between the legal regulation of the environment and competing social and economic priorities. Credit will only be granted for one of LAW 586 or LAW 386.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 587 (3/4) d Environmental Law.</b> A foundation course dealing with the regulatory and policy framework for the protection of the environment in Canada, such as pollution control and biodiversity conservation. Credit will only be granted for one of LAW 587 or LAW 387.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are</p>



	open to graduate students.
<p>Proposed Calendar Entry:  <b>LAW 595 (3) Forest Law</b>  Acquisition of timber interests; development, financing and organization of timber companies; regulation of exploitation industry interests; management taxation. Not offered each year; consult Faculty.  Prerequisite: LAW 392 is recommended.  Credit will only be granted for one of LAW 595 or Law 395.</p>	<p>Present Calendar Entry:  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action:  Create new course and add cross-listing</p> <p>Rationale for Proposed Change:  We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:  <b>LAW 519 (3) Individual Employment Law</b>  Legal aspects of employment relationships other than those arising by collective bargaining. Not offered each year, consult Faculty.  Credit will only be granted for one of LAW 519 or LAW 419.</p>	<p>Present Calendar Entry:  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action:  Create new course and add cross-listing</p> <p>Rationale for Proposed Change:  We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:  <b>LAW 523 (1-3) d Topics in Intellectual Property</b></p>	<p>Present Calendar Entry:  <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p>



<p>Not offered each year, consult Faculty. Credit will only be granted for one of LAW 523 or LAW 423.</p>	<p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 570 (3) Intellectual Property</b> Copyright, patents, trade marks, industrial design, the protection of computer software, and torts such as passing-off and breach of confidence. Credit will only be granted to one of LAW 570 or LAW 422.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry: <b>LAW 571 (3) Communications Law</b> Selected legal issues relating to the communications industries and their regulation. Not offered each year, consult Faculty. Credit will only be granted for one of LAW 571 or LAW 424.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p>	<p>Present Calendar Entry:</p>



<p><b>LAW 572 (3) Cyberspace Law</b> Legal issues arising from the development of the Internet and cyberspace. This course is not eligible for Credit/D/Fail grading. Credit will only be granted for one of LAW 572 or LAW 425.</p>	<p><a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 537 (3) Commercial Transactions</b> The law of sale of goods, bills of exchange, promissory notes, and cheques. [3-0]</p> <p>Credit will only be granted for one of LAW 537 or LAW 437.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 538 (3) Secured Transactions</b> The law governing the creation, perfection and enforcement of security interests in personal property. Credit will only be granted for one of LAW 538 or LAW 438.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>



<p>Proposed Calendar Entry:</p> <p><b>LAW 540 (3) Insurance Law</b> The general legal principles of life, automobile, fire and other types of insurance; the regulation of the insurance industry. Credit will only be granted for one of Law 540 or Law 440.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 599 (3) Creditors' Remedies</b> Remedies of an unsecured creditor; fraudulent conveyances and preferences; builders' liens; bankruptcy. Prerequisite: LAW 437 and LAW 438 are recommended Credit will only be granted for one of LAW 599 or LAW 443.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 547 (1-3) d Topics in Commercial Law</b> Not offered each year, consult Faculty. Credit will only be granted for one of LAW 447 or LAW 547.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses</p>





	are already run at the JD level and are open to graduate students.
<p>Proposed Calendar Entry:</p> <p><b>LAW 548 (3) Sports Law</b> Legal issues relating to the sports industry and those who participate in it. Not offered each year, consult Faculty. Credit will only be granted for one of LAW 548 or LAW 448.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 573 (3) Media and Entertainment Law</b> Selected legal issues relating to the media and entertainment industries and their regulation. Not offered each year, consult Faculty. Credit will only be granted for one of LAW449 or LAW 573.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 551 (3) Trusts</b> History and nature of trusts; express, resulting, implied and constructive trusts; charitable and purpose trusts; administration of trusts; breach of trust.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p>



<p>Credit will be granted for only one of LAW 250 or LAW 451.</p> <p>Credit will only be granted for one of LAW 551 or LAW 451.</p>	<p>Rationale for Proposed Change:</p> <p>We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 574 (3) Succession</b></p> <p>The law of wills and intestate succession, variation of wills, principles of probate and administration of estates.</p> <p>Prerequisite: LAW 250 or LAW 451 is recommended.</p> <p>Credit will only be granted for one of LAW 452 or LAW 574.</p>	<p>Present Calendar Entry:</p> <p><a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action:</p> <p>Create new course and add cross-listing</p> <p>Rationale for Proposed Change:</p> <p>We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 575 (3) Equitable Remedies</b></p> <p>The history and development of equitable remedies such as specific performance, injunctions, declarations, relief against forfeiture, and tracing.</p> <p>Credit will only be granted for one of LAW 575 or LAW 453.</p>	<p>Present Calendar Entry:</p> <p><a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action:</p> <p>Create new course and add cross-listing</p> <p>Rationale for Proposed Change:</p> <p>We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>



<p>Proposed Calendar Entry:</p> <p><b>LAW 576 (3) Securities Regulation</b> The law relating to the distribution of securities. Continuous and timely disclosure requirements and civil liability. Credit will only be granted for one of LAW 576 or LAW 463.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 590 (3) Civil Procedure</b> Problems in the conduct of civil litigation including: ethical considerations; substantive problems such as notice, pleading, and discovery; and selected procedural problems. Credit will be granted for only one of LAW 270 or LAW 469. [2-0] or [3-0] Credit will only be granted for one of LAW 590 or LAW 469.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 594 (1-3) d Topics in Corporate Law</b> Not offered each year, consult Faculty. This course is not eligible for Credit/D/Fail grading. Credit will only be granted to one of LAW 467 or LAW 594.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change:</p>



	<p>We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 592 (3) Conflict of Laws</b> A study of the private legal problems arising in cases in which the relevant facts cut across provincial or national boundaries. Credit will only be granted to one of Law 325 or LAW 592.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>
<p>Proposed Calendar Entry:</p> <p><b>LAW 591 (3) Environmental Law Workshop</b> Legal research and writing for environmental agency or NGO under supervision of faculty member and lawyer. Not offered every year, consult Faculty. Credit will only be granted to one of LAW 591 or LAW 390.</p>	<p>Present Calendar Entry: <a href="http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW">http://www.calendar.ubc.ca/vancouver/courses.cfm?code=LAW</a></p> <p>Type of Action: Create new course and add cross-listing</p> <p>Rationale for Proposed Change: We are permanently cross listing courses for graduate LLM CL students. The courses are already run at the JD level and are open to graduate students.</p>



## UBC Curriculum Proposal Form Change to Course or Program

<b>Faculty:</b> Medicine <b>Department:</b> SPPH <b>Faculty Approval Date:</b> 12 June 2018 <b>Effective Session (W or S):</b> W <b>Effective Academic Year:</b> 2018	<b>Date:</b> 08/01/2018 <b>Contact Person:</b> Shaine Meghji <b>Phone:</b> 604-822-2827 <b>Email:</b> shaine.meghji@ubc.ca
<b>Proposed Calendar Entry:</b>  <div style="background-color: yellow; padding: 5px;"> <b>SPPH 569 (3) – Industrial and Environmental Acoustics and Vibration</b>          Fundamentals of acoustics and vibrations, physiologic effects, measurement, instrumentation, interpretation of data, industrial standards, and control. For students in Occupational and Environmental Hygiene; other graduate students may enroll with permission of the instructor.       </div>  <div style="background-color: yellow; padding: 5px;">         Credit will only be given for one SPPH 569 or MECH 505       </div>	<b>URL:</b> <b>Present Calendar Entry:</b> N/A  <b>Type of Action:</b> Create new course  <b>Rationale for Proposed Change:</b>  Create course number SPPH 569 to replace MECH 505 Fundamentals of acoustics and vibrations is a core competency for occupational and environmental health practice. This course (MECH 505) was developed for OEH by a faculty member cross appointed in Mechanical Engineering. This was a specialized course which only OEH students (not Engineering) students were eligible to receive credit for. As of 2017, SPPH has the expertise and faculty to deliver this course, and the mechanical Engineering faculty is no longer involved.  <input type="checkbox"/> <b>Not available for Cr/D/F grading (undergraduate courses only)</b> (Check the box if the course is NOT eligible for Cr/D/F grading and provide the rationale for this below. Note: Not applicable to graduate-level courses.)  <b>Rationale for not being available for Cr/D/F:</b> The default is that undergraduate courses are offered for Cr/D/F unless there is a significant reason as to why it should not be so.  <input type="checkbox"/> <b>Pass/Fail or</b> <input type="checkbox"/> <b>Honours/Pass/Fail grading</b> (Check one of the above boxes if the course will be graded on a P/F or H/P/F basis. Default grading is percentage.)

## UBC Curriculum Proposal Form Change to Course or Program

### Category: (1)

<b>Faculty:</b> Land and Food Systems <b>Department:</b> Dean's Office <b>Faculty Approval Date:</b> March 22, 2018 <b>Effective Session (W or S):</b> Winter <b>Effective Academic Year:</b> 2018	<b>Date:</b> January 26, 2018 <b>Contact Person:</b> Hannah Wittman <b>Phone:</b> (604) 822-1644 <b>Email:</b> Hannah.Wittman@ubc.ca
<b>Proposed Calendar Entry:</b>  Dual Degree and Minor Options ...  Minor in Science .....  <b>Minor in Sustainable Food Systems</b>  <b>The Minor in Sustainable Food Systems</b> emphasizes an interdisciplinary perspective and experiential learning.  <b>The Sustainable Food Systems Minor</b> consists of LFS 350, 12 credits from 300- or 400-level courses from an approved list of courses available on the Faculty website (link added to <a href="http://www.landfood.ubc.ca/academics/undergraduate/ug-admissions/">http://www.landfood.ubc.ca/academics/undergraduate/ug-admissions/</a> ), and 3 credits selected from APBI 465, LFS 450, or LFS 496 for a total of 18 credits. Students must have their course of studies approved by an LFS advisor.  <b>Upon successful completion of the minor program, the notation "Minor in Sustainable Food Systems" will be added to the student's transcript.</b>	<a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,194,909,0">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,194,909,0</a>  <b>Present Calendar Entry:</b>  Dual Degree and Minor Options  ...  Minor in Science  <b>Type of Action:</b> Add a new Sustainable Food Systems minor to the list of minors offered by the Faculty of Land and Food Systems  <b>Rationale for Proposed Change:</b> At UBC, many students seek formal training in food systems thinking and sustainability assessment through internships, volunteering at UBC Farm, elective courses and directed studies. However, there is no formal, non-major mechanism to receive academic recognition of food systems sustainability training outside of a single disciplinary specialization. The Minor in Sustainable Food Systems aims to provide students in Land and Food Systems with a recognized pathway to gain knowledge and understanding of the connections between

	<p>food, health, society, and the environment, thereby providing the tools needed to solve complex food systems problems at the local and global scale. This new minor leverages existing experiential and interdisciplinary learning opportunities at UBC (across several departments and faculties, and with off-campus partners) to meet the growing student demand for sustainable food systems education.</p>
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Website information:

Proposed List of Courses: Students are required to select a total of 12 credits from the courses below. A minimum of 1 course from each set must be selected.

**Set 1**

<a href="#">APBI 314</a>	Animals and Society
<a href="#">APBI 315</a>	Animal Welfare and the Ethics of Animal Use
<a href="#">BIOL 343</a>	Plants and Peoples
<a href="#">EDCP 329</a>	Agriculture in the Curriculum
<a href="#">FNH 342</a>	Critical Perspectives on Consumer Food Practices
<a href="#">FNH 355</a>	International Nutrition
<a href="#">FNH 455</a>	Applied International Nutrition
<a href="#">SOCI 342</a>	Consumers and Consumption
<a href="#">SOCI 360A</a>	Sociology and Natural Resources - RESOURCES
<a href="#">SOCI 423</a>	Sociology of Food
<a href="#">GEOG 410</a>	Environment and Society

**Set 2**

<a href="#">APBI 360</a>	Agroecology II
<a href="#">APBI 402</a>	Sustainable Soil Management
<a href="#">APBI 428</a>	Integrated Pest Management

<a href="#"><u>APBI 444</u></a>	Agroforestry
<a href="#"><u>ENVR 430</u></a>	Ecological Dimensions of Sustainability
<a href="#"><u>ENVR 440</u></a>	Analytical Methods in Sustainability Science
<a href="#"><u>FNH 313</u></a>	Microorganisms in Food Systems
<a href="#"><u>FNH 309</u></a>	Food Process Science
<a href="#"><u>GEOG 310</u></a>	Environment and Sustainability
<a href="#"><u>GEOG 318</u></a>	Sustainability in a Changing Environment

### Set 3

<a href="#"><u>APBI 361</u></a>	Key Indicators of Agroecosystem Sustainability
<a href="#"><u>APBI 414</u></a>	Animals and Global Issues
<a href="#"><u>FNH 415</u></a>	Business Concepts in Food, Nutrition, and Health
<a href="#"><u>FRE 302</u></a>	Small Business Management in Agri-food Industries
<a href="#"><u>FRE 306</u></a>	Introduction to Global Food Markets
<a href="#"><u>FRE 340</u></a>	International Agricultural Development
<a href="#"><u>FRE 374</u></a>	Land and Resource Economics
<a href="#"><u>FRE 460</u></a>	Economics of Food Consumption
<a href="#"><u>GEOG 311</u></a>	Urban Environments





## UBC Curriculum Proposal Form Change to Course or Program

### Category: (1)

<p><b>Faculty:</b> Law  <b>Department:</b> Law  <b>Faculty Approval Date:</b> April 12, 2018  <b>Effective Session (W or S):</b> W  <b>Effective Academic Year:</b> 2018</p>	<p><b>Date:</b> May 23, 2018  <b>Contact Person:</b> Nikos Harris  <b>Phone:</b> 604-827-5340  <b>Email:</b> nharris@allard.ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>Regular Program</b></p> <p>...</p> <p><b>Seminar or Directed Research:</b> A student must undertake, in either the second or third year, at least one independent research project and submit a substantial paper (or series of papers) embodying the results of this research. This obligation usually will be satisfied within a 3 credit seminar but students may fulfill this obligation by completing a project, for at least 3 credits, under LAW 493, 494, 495, or 496 (Directed Research).</p> <p><b>Experiential Learning Credit Requirement:</b> Beginning with the entering class of 2018, J.D. students in the Peter A. Allard School of Law are required to complete one experiential course or program before graduation. This experiential requirement is met through successfully completing:</p> <ul style="list-style-type: none"> <li>• a for-credit clinical program;</li> <li>• a for-credit competitive moot; or</li> <li>• one of the courses approved by the Associate Dean Academic and the Faculty's Curriculum Committee as having a substantial experiential component and listed on the</li> </ul>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,207,358,329">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,207,358,329</a></p> <p><b>Present Calendar Entry:</b></p> <p><b>Regular Program</b></p> <p>...</p> <p><b>Seminar or Directed Research:</b> A student must undertake, in either the second or third year, at least one independent research project and submit a substantial paper (or series of papers) embodying the results of this research. This obligation usually will be satisfied within a 3 credit seminar but students may fulfill this obligation by completing a project, for at least 3 credits, under LAW 493, 494, 495, or 496 (Directed Research).</p>



<p><b>Faculty's website.</b>  <a href="http://www.allard.ubc.ca/student-resources/academic-services">http://www.allard.ubc.ca/student-resources/academic-services</a></p> <p><b>The Experiential Learning Credit does not change the number of credits required for the J.D. degree.</b></p> <p>Maximum Credits for Experiential Learning: Commencing for students entering second-year Law in September 2017, students are limited to a total of 20 credits of clinical offerings, competitive mootings and Law 486 Law Review Credit; and students may not take more than two clinical offerings during their Juris Doctor program.</p> <p>...</p>	<p><b>Maximum Credits for Experiential Learning:</b> Commencing for students entering second-year Law in September 2017, students are limited to a total of 20 credits of clinical offerings, competitive mootings and Law 486 Law Review Credit; and students may not take more than two clinical offerings during their Juris Doctor program.</p> <p><b>Type of Action:</b></p> <p>New J.D. Degree Requirement</p> <p><b>Rationale for Proposed Change:</b></p> <p>This new degree requirement for J.D. students has two central rationales. The first is to ensure that all J.D. law students have the many pedagogical benefits of experiential learning in their legal education. The second is to assist in providing access to justice in the community as many of Allard's experiential programs involve providing legal services to low income and marginalized persons.</p> <p>The rationales for the proposal are set out in more detail in the attached memorandum.</p>
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THE UNIVERSITY OF BRITISH COLUMBIA

## Faculty of Science

### Curriculum Committee Report

# PROGRAM AND SPECIALIZATIONS CATEGORY ONE

**MAY 2018**

### Curriculum Committee

N. Hutchinson	Chair
C. Pang	Anesthesia, Pharmacology and Therapeutics
W. Williams	Biochemistry and Molecular Biology
A. O'Neill	Botany
S. Osborne	Cellular & Physiological Sciences
M. Thachuk	Chemistry
G. Tsiknis	Computer Science
J. Iqbal	Co-op Education Programs
M. Jellinek	Earth, Ocean and Atmospheric Sciences
C. Addison	Gateway Programs
I. McKendry	Geography
G. Oberg	Inst. for Resources, Environment and Sustainability
M. McAllister	Institute for the Oceans and Fisheries
L. Groat	Integrated Sciences
W. Nagata	Mathematics
W. Bingle	Microbiology and Immunology
T. Mattison	Physics and Astronomy
S. Barnes	Psychology
B. Dunham	Statistics
A. O'Neill	Zoology
J. Chai	SUS Representative
P. Johnson	SUS Representative
M. Milner-Bolotin	Faculty of Education, Curriculum Studies
S. Smukler	Faculty of Land & Food Systems
C. Nahm	Science Information Centre
S. Harris	Dean's Office

May 10, 2018

## DEAN'S OFFICE

**Category: (1)**

<b>Faculty:</b> Science <b>Department:</b> Dean's Office <b>Faculty Approval Date:</b> May 10, 2018	<b>Date:</b> May 10, 2018 <b>Contact Person:</b> Norm Hutchinson <b>Phone:</b> 604-822-8818 <b>Email:</b> norm@cs.ubc.ca
<b>Effective Date for Change:</b> 19S  <b>Proposed Calendar Entry:</b>  General Degree Requirements  ...  The requirements applicable to all B.Sc. degree options and specializations include the Communication, Lower-level, Upper-level, Science, Arts, <b>and Science Breadth [Link-to new page containing Science Breadth Requirement]</b> Requirements.	<a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,408">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,408</a> <b>Present Calendar Entry:</b>  General Degree Requirements  ...  The requirements applicable to all B.Sc. degree options and specializations include the Communication, Lower-level, Upper-level, Science, <del>and Arts Requirements. In addition, the Science or Arts Breadth Requirement applies to Major options and may also apply to Combined Major and Double Major options, depending on the fields studied.</del>  <b>Action:</b> Add the new Science Breadth requirement to the list of General Degree requirements. Remove the reference to the now obsolete Science or Arts Breadth Requirement.  <b>Rationale:</b> The proposed introduction of a new Science Breadth requirement and retirement of the old Breadth Requirement (here called the Science of Arts Breadth Requirement) requires updating this page of general degree requirements.  <b>Supporting Documents:</b> SCI-17-2

**Category: (1)**

<b>Faculty:</b> Science <b>Department:</b> Dean's Office <b>Faculty Approval Date:</b> May 10, 2018	<b>Date:</b> May 10, 2018 <b>Contact Person:</b> Norm Hutchinson <b>Phone:</b> 604-822-8818 <b>Email:</b> norm@cs.ubc.ca
<b>Effective Date for Change:</b> 19S  <b>Proposed Calendar Entry:</b>  Science <b>and</b> Arts Requirements  ...	<a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1464">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1464</a> <b>Present Calendar Entry:</b>  Science <b>and</b> Arts <del>and Breadth</del> Requirements  ...  <del><b>Breadth Requirement</b>  This requirement applies only to major options and is intended to encourage students to expand their studies outside of the area of specialization. Double major and combined major options satisfy the Breadth Requirement unless one specialization or area falls within the field of major of the other (e.g., computer science and mathematics are within each other's field of major; see table below). In such cases, the Breadth Requirement must be satisfied with additional credits. Majors in Cognitive Systems and Environmental Sciences satisfy the breadth requirement using their specialization requirements. Honours, combined honours, and General Science options are not subject to the Breadth requirement.</del>  <del>The Breadth Requirement must be fulfilled with courses with either science or Arts credit. Of the electives available after the Lower level Requirements, Arts Requirement, and the specific courses required by the student's specialization have been met, at least 9 credits must be in science courses outside the field of the major or in additional Arts courses (or in a combination of science and Arts courses). Refer to the following table for definitions of the field of the major. All ISCI courses, excluding ISCI 300, may count as breadth electives in all major specializations, except for Integrated Science. SCIE 120 and ASIC 220 (SCIE 220) may count as breadth in all majors. Major specializations other than Psychology may also count COGS 200 as a breadth elective.</del>

	<p><del>Courses in the field of major</del>  <del>Astronomy ASTR, MATH, PHYS</del>  <del>Atmospheric Science ATSC, EOSC</del>  <del>(Oceanography), GEOB, PHYS</del>  <del>Behavioural Neuroscience PSYC, BIOC, BIOL,</del>  <del>CAPS, COGS, PCTH, PHYL</del>  <del>Biochemistry BIOC, BIOL, CHEM, MICB, and</del>  <del>all courses offered for science credit by</del>  <del>departments in the Faculty of Medicine</del>  <del>Biology BIOC, BIOL, MICB, MRNE, EOSC</del>  <del>270, 470, 471, 474, 475, 478; PSYC 304, 306;</del>  <del>PSYC (science), and science credit courses in</del>  <del>the Faculties of Medicine and Land &amp; Food</del>  <del>Systems</del>  <del>Chemistry CHEM, PHYS, BIOC</del>  <del>Computer Science CPSC, MATH, STAT</del>  <del>Earth &amp; Ocean Sciences EOSC, ATSC</del>  <del>Geography GEOB, GEOG</del>  <del>Geology EOSC, GEOB</del>  <del>Geophysics EOSC, MATH, PHYS</del>  <del>Integrated Sciences The combination of all</del>  <del>fields of major listed in this table that include</del>  <del>one or more upper level course(s) in the</del>  <del>student's contract (e.g., the field of major for an</del>  <del>IS contract consisting of upper level CHEM and</del>  <del>MATH courses is all of CHEM, PHYS, BIOC,</del>  <del>MATH, STAT, and CPSC).</del>  <del>Mathematics MATH, STAT, CPSC</del>  <del>Microbiology &amp; Immunology MICB, BIOL, and</del>  <del>science credit courses in the Faculty of Medicine</del>  <del>Pharmacology BIOC, BIOL, CAPS, PCTH,</del>  <del>PHYL, and science credit courses in the Faculty</del>  <del>of Medicine</del>  <del>Physies PHYS, ASTR, MATH</del>  <del>Statistics STAT, MATH, CPSC</del></p> <p><b>Action:</b> Eliminate the Breadth Requirement and the field of major table.</p> <p><b>Rationale:</b> With the proposed changes replacing the Computational Sciences, Physical Sciences, and Biology Requirements with the new Science Breadth Requirement, the Breadth requirement is no longer necessary. Every student satisfying the new Science Breadth Requirement will have sufficient breadth in Science.</p> <p><b>Supporting Documents:</b> SCI-17-2</p>
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**Category: (1)**

<p><b>Faculty:</b> Science  <b>Department:</b> Dean's Office  <b>Faculty Approval Date:</b> May 10, 2018</p>	<p><b>Date:</b> May 10, 2018  <b>Contact Person:</b> Norm Hutchinson  <b>Phone:</b> 604-822-8818  <b>Email:</b> norm@cs.ubc.ca</p>
<p><b>Effective Date for Change:</b> 19S</p> <p><b>Proposed Calendar Entry:</b></p> <p><b>Science Breadth Requirement</b></p> <p>All B.Sc. students are required to have reasonable breadth in their understanding of science.</p> <p>For the purposes of this requirement, courses for Science credit are separated into 7 categories by course codes:</p> <ol style="list-style-type: none"> <li>1. <b>Mathematics:</b> All MATH courses, except MATH 302</li> <li>2. <b>Chemistry:</b> All CHEM courses, except CHEM 100, CHEM 300</li> <li>3. <b>Physics:</b> All PHYS courses, except PHYS 100</li> <li>4. <b>Life Science:</b> All BIOL courses except BIOL 140, BIOL 300; all BIOC, PSYC (courses numbered from 60 to 89 in the last 2 digits), and MICB courses and GEOB 207</li> <li>5. <b>Statistics:</b> BIOL 300, DSCI 100, MATH 302, all STAT courses</li> <li>6. <b>Computer Science:</b> All CPSC courses</li> <li>7. <b>Earth &amp; Planetary Science:</b> All ASTR, ATSC, ENVR, EOSC, GEOB courses except EOSC 111 and GEOB 207.</li> </ol> <p>Students in a major or honours specialization must successfully complete at least 3 credits from any 6 of the 7 categories. Students in a combined major or combined honours specialization must successfully complete at least 3 credits from any 5 of the 7 categories.</p> <p>These courses can be at any level.</p>	<p>A new url must be created. It is linked to from the Faculty of Science B.Sc. table of contents, the General Degree Requirements, and the Promotion Requirements.</p> <p><b>Present Calendar Entry:</b></p> <p><b>Action:</b> Add the new Science Breadth Requirement.</p> <p><b>Rationale:</b> The Faculty of Science lower level requirement has been in place since 2001, and currently requires 9 credits of computational science, 6 credits of physical science, and 3 credits of "other science": either BIOL, ASTR, ATSC, EOSC, or GEOB. This requirement is not exposing students to the breadth of science in first year as well as it might, as students may satisfy the requirement by taking courses from as few as 3 science disciplines. Of the 1944 4<sup>th</sup> year students in Science in 2016, 120 of them have taken courses in 4 or fewer of the broad categories in Science described in the new Science Breadth requirement.</p> <p>The new breadth requirement balances a desire to expose students to as many of the disciplines that make up the Faculty of Science as possible, while not putting too much burden on students who are pursuing specializations (like combined specializations) that leave students with very few</p>

**Students must satisfy at least all but one of the required categories before they can be promoted to fourth year. That is, students in a combined specialization must satisfy 4 of the required 5 categories and students in a non-combined specialization must satisfy 5 of the required 6 categories.**

**Students who successfully complete Science One (SCIE 001) are credited with having successfully completed at least 3 credits from the Mathematics, Chemistry, Physics and Life Science categories.**

elective choices.

The new requirement recognizes the increasing importance of computer and statistical methods in science research, as well as increases the fairness with which students in the many disciplines within the Faculty of Science are treated by placing, as much as practical, all areas of Science on an equal footing with respect to how they contribute to students' breadth.

Over the last 20 years (we have data from 1996 – 2016) the percentage of students who have completed at least one course from only 4 of the 7 categories has decreased from 14.1% to 6.2%, while the percentage of students who have completed at least one course in all 7 categories has increased from 4.1% to 23.1%. For completeness, the percentage of students completing 5 categories has decreased from 55.7% to 25.9% and those completing 6 categories has increased from 26.1% to 44.9%. This data suggests that students overall have recognized the value of breadth, but there are some students that are still very narrow. The new Science Breadth requirement will require these students to increase the breadth of their exposure to Science and thus better prepare them for today's more interdisciplinary work and research environments.

We have also examined the burden that implementing this proposal will place on students. Looking again at the 1944 4<sup>th</sup> year B.Sc. students in 2016, 265 students were in a combined major or combined honours specialization and would be required to satisfy 5 of the 7 categories. Only 6 students (2.2%) did not satisfy 5 categories, and 223 of them (84.2%) satisfied 6 or more categories. Of the 1679 students in a single major or honours specialization who would be required to satisfy 6 categories, 1106 (65.9%) did so, 465 (27.7%) were one category short, and only 108 (6.4%) were two or more categories short. These numbers are conservative in the sense that we have only looked at courses that appear on the transcript and have not included students whose experience has granted them exemptions or other considerations.



	<p>Implementing the proposed Science Breadth requirement will require a few disciplines to deliver courses to more students. Looking at data from 2016, of the 1944 4<sup>th</sup> year students pursuing a B.Sc., 383 students did not satisfy the Statistics category, 697 students did not satisfy the Earth &amp; Planetary Science category, and 992 students did not satisfy the Computer Science category. Both Computer Science and Statistics have confirmed their commitment to expanding their ability to deliver the required courses, and the Earth &amp; Planetary Science load will be distributed across a number of departments and should be manageable.</p> <p><b>Supporting Documents: SCI-17-2</b></p>
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**Category: (1)**

<b>Faculty:</b> Science <b>Department:</b> Dean's Office <b>Faculty Approval Date:</b> May 10, 2018	<b>Date:</b> May 10, 2018 <b>Contact Person:</b> Norm Hutchinson <b>Phone:</b> 604-822-8818 <b>Email:</b> norm@cs.ubc.ca
<b>Effective Date for Change:</b> 19S  <b>Proposed Calendar Entry:</b>  Lower-level Requirements  <b>Foundational Requirement</b>  <b>All B.Sc. students must successfully complete appropriate foundational courses in Biology, Chemistry, and Physics.</b>  <b>Students admitted to the B.Sc. with credit for neither Biology 11 nor Biology 12 must successfully complete 3 credits of 100-level BIOL (usually BIOL 111). Students without credit for Chemistry 12 must successfully complete CHEM 100 or CHEM 111. Students without credit for Physics 12 must successfully complete 3 credits of 100-level PHYS (usually PHYS 100).</b>	<a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1465">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1465</a> <b>Present Calendar Entry:</b>  Lower-level Requirements  <del>Every student must complete (or have advance credit or placement in) the minimum requirements in physical sciences, computational sciences, biology or another science, and in laboratory science described below. See also the note on Science One below.</del>  <del>Advance credit or placement may be granted where appropriate when the equivalent of any or all of these courses is completed at another institution prior to admission to the University.</del>  <del>Note: All Lower-Level Requirements must be fulfilled before a student will be given fourth-year standing. See Promotion Requirements.</del>  <del>Students intending to apply for entry to another degree program at UBC or elsewhere should refer to the entrance requirements for each of those academic units. These requirements must be included within an option and specialization that meet the requirements of the Faculty of Science.</del>

	<p><del>Students intending to do graduate work in the sciences are reminded that competence in the reading of scientific literature in one or two languages other than English is sometimes required.</del></p> <p><del>Students are reminded that the regulations listed under Academic Performance and Continuation apply.</del></p> <p><del>Computational Sciences</del>  <del>Students take one of MATH 100, 102, 104, 110, 180, 184, or 120 and 6 computational credits. These courses are normally in CPSC, MATH, or STAT. Some specializations may allow the completion of other computational courses to satisfy 3 credits of the requirement. These alternative courses are specified in the specialization descriptions.</del></p> <p><del>Students who intend to pursue an honours specialization requiring 6 credits of calculus should consider MATH 120/121, as these enriched courses provide a foundation for such specializations.</del></p> <p><del>Physical Sciences</del>  <del>Students take CHEM 111 if credit was not obtained for Chemistry 12 and 3 credits of 100-level PHYS (normally PHYS 100) if credit was not obtained for Physics 12. CHEM 111 and PHYS 100 do not count toward the minimum number of physical sciences credits required. All students take 6 to 8 credits of CHEM and/or PHYS lecture courses at the 100-level beyond CHEM 111 and PHYS 100.</del></p> <p><del>Students who intend to pursue an honours specialization should consider PHYS 107/108/109, as these enriched courses provide a foundation for such specializations.</del></p> <p><del>Biology Requirement</del>  <del>Students who do not have credit for Biology 11 or 12 take 3 credits of 100-level BIOL (usually BIOL 111). Students with credit for Biology 11 or 12 must successfully complete 3 credits of an ASTR, ATSC, BIOL, EOSC, or GEOB lecture</del></p>
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<p>Laboratory Science <b>Requirement</b></p> <p><b>All students are required to have experience with scientific thinking and practice in a lab course where they observe or interact with the real world. Students must complete one course selected from the following list: ASTR 101, ASTR 102, BIOL 140, CHEM 111, CHEM 121, CHEM 123, EOSC 111, PHYS 101, PHYS 107, PHYS 109, PHYS 119, PHYS 159, SCIE 001.</b></p> <p><b>Advance credit or placement, or transfer credit, may be granted where appropriate when the equivalent of any or all of these courses is completed at another institution prior to admission to the University.</b></p> <p><b>Students intending to apply for entry to another degree program at UBC or elsewhere should refer to the entrance requirements for each of those academic units. These requirements must be included within an option and specialization that meet the requirements of the Faculty of Science.</b></p> <p><b>Students are reminded that the regulations listed under Academic Performance and Continuation apply [link to <a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1459#18650">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1459#18650</a>].</b></p> <p>Additional Lower-level Courses</p> <p>Students take additional courses chosen from Science or Arts as required to fulfill prerequisites for the intended area or areas of study. A B.Sc. program may include up to 18 credits from a faculty other than Science or Arts; see Credit at UBC and Elsewhere.</p>	<p><del>course:</del></p> <p>Laboratory Science</p> <p><del>Students take two one-term laboratory courses chosen from ASTR, BIOL, CHEM, EOSC, GEOB, PHYS, and PSYC. These may be stand-alone labs or parts of lecture-lab courses included in other requirements listed above.</del></p> <p>Additional Lower-level Courses</p> <p><del>The requirements above set the minimum number of 100-level courses required.</del> Students take additional courses chosen from Science or Arts as required to fulfill prerequisites for the intended area or areas of study. A B.Sc. program may include up to 18 credits from a faculty other than Science or Arts; see Credit at UBC and Elsewhere.</p> <p><del>Science One (SCIE 001)</del>  <del>Students with credit for Science One (SCIE 001) and BIOL 140 have met all first-year biology, chemistry, mathematics, and physics</del></p>
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~~requirements for specializations in the Faculty of Science, and satisfy the lower level requirements for physical sciences, biology, and laboratory science and 6 of the required 9 credits in computational science.~~

**Action:** Reword the Lower-level Requirements to emphasize the Foundational Requirement. Delete the Computational Sciences, Physical Sciences, and Biology Requirements. Redefine the Laboratory Science Requirement.

**Rationale:** The Faculty of Science lower level requirements have been in place since 2001, and currently require 9 credits of computational science, 6 credits of physical science, and 3 credits of “other science”: either BIOL, ASTR, ATSC, EOSC, or GEOB. These requirements are not exposing students to the breadth of science in first year as well as it might, as students may satisfy the requirements by taking courses from as few as 3 science disciplines. Of the 1944 4<sup>th</sup> year students in Science in 2016, 120 of them have taken courses in 4 or fewer of the broad categories in Science described in the new Science Breadth requirement.

The new foundational requirement collects in one place the expectation that students have an appropriate foundation in pre-university courses in Biology, Chemistry, Math, and Physics. The requirement does not place any new requirements on students.

The new Science Breadth Requirement balances a desire to expose students to as many of the disciplines that make up the Faculty of Science as possible, while not putting too much burden on students who are pursuing specializations (like combined specializations) that leave students with very few elective choices. The new requirement recognizes the increasing importance of computer and statistical methods in science research, as well as increases the fairness with which students in the many disciplines within the Faculty of Science are treated by placing, as much as practical, all areas of Science on an equal footing with respect to

	<p>how they contribute to students' breadth.</p> <p>Over the last 20 years (we have data from 1996 – 2016) the percentage of students who have completed at least one course from only 4 of the 7 categories has decreased from 14.1% to 6.2%, while the percentage of students who have completed at least one course in all 7 categories has increased from 4.1% to 23.1%. For completeness, the percentage of students completing 5 categories has decreased from 55.7% to 25.9% and those completing 6 categories has increased from 26.1% to 44.9%. This data suggests that students overall have recognized the value of breadth, but there are some students that are still very narrow. The new Science Breadth requirement will require these students to increase the breadth of their exposure to Science and thus better prepare them for today's more interdisciplinary work and research environments.</p> <p>We have also examined the burden that implementing this proposal will place on students. Looking again at the 1944 4<sup>th</sup> year B.Sc. students in 2016, 265 students were in a combined major or combined honours specialization and would be required to satisfy 5 of the 7 categories. Only 6 students (2.2%) did not satisfy 5 categories, and 223 of them (84.2%) satisfied 6 or more categories. Of the 1679 students in a single major or honours specialization who would be required to satisfy 6 categories, 1106 (65.9%) did so, 465 (27.7%) were one category short, and only 108 (6.4%) were two or more categories short. These numbers are conservative in the sense that we have only looked at courses that appear on the transcript and have not included students whose experience has granted them exemptions or other considerations.</p> <p>Implementing the proposed Science Breadth requirement will require a few disciplines to deliver courses to more students. Looking at data from 2016, of the 1944 4<sup>th</sup> year students pursuing a B.Sc., 383 students did not satisfy the Statistics category, 697 students did not satisfy the Earth &amp; Planetary Science category, and 992</p>
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	<p>students did not satisfy the Computer Science category. Both Computer Science and Statistics have confirmed their commitment to expanding their ability to deliver the required courses, and the Earth &amp; Planetary Science load will be distributed across a number of departments and should be manageable.</p> <p>The changes to the Laboratory requirement are to clarify that the purpose of the requirement is to give students an opportunity to learn by observing or interacting with the real world, and to reduce the quantity of laboratory experience that is required to a single experience. The last decade has seen lecture courses with integrated labs replaced by separate lecture and lab courses in a number of disciplines. In this environment, requiring two lab experiences has caused significant difficulties for some students, unnecessarily restricting the courses options that are available to them. Reducing the number of required lab experiences from two to one will place one less barrier in the way of students' choices, while still giving them an introduction to the more experimental or experiential mode of learning that a lab experience provides.</p> <p><b>Supporting Documents: SCI-17-2</b></p>
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**Category: (1)**

<b>Faculty:</b> Science <b>Department:</b> Dean's Office <b>Faculty Approval Date:</b> May 10, 2018	<b>Date:</b> May 10, 2018 <b>Contact Person:</b> Norm Hutchinson <b>Phone:</b> 604-822-8818 <b>Email:</b> norm@cs.ubc.ca
<b>Effective Date for Change:</b> 19S  <b>Proposed Calendar Entry:</b>  Promotion Requirements  ...  Promotion to Fourth Year  Promotion to fourth year requires successful completion of a total of 72 or more credits. Of these, 50 or more credits must be science credits, including: <b>(1)</b> all of the Faculty of Science Lower-Level Requirements; <b>(2) at least all but one of the courses required to satisfy the Science Breadth Requirement;</b> <b>(3)</b> all required courses specified in the first and second years by the specialization (but not all general electives); and <b>(4)</b> at least 40% of the credits specified in the upper years by the specialization. In addition, the Communication Requirement must be complete.  ...	<a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1467">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1467</a> <b>Present Calendar Entry:</b>  Promotion Requirements  ...  Promotion to Fourth Year  Promotion to fourth year requires successful completion of a total of 72 or more credits. Of these, 50 or more credits must be science credits, including all of the Faculty's Lower-Level Requirements; all required courses specified in the first and second years by the specialization (but not all general electives); and at least 40% of the credits specified in the upper years by the specialization. In addition, the Communication Requirement must be complete.  ...  <b>Action:</b> Add the Science Breadth Requirement to the list of requirements that must be satisfied before promotion to fourth year.  <b>Rationale:</b> The proposed introduction of a new Science Breadth requirement requires updating the requirement for promotion to fourth year.  <b>Supporting Documents:</b> SCI-17-2





19 September 2018

To: Vancouver Senate  
From: Senate Curriculum Committee  
Re: September Certificate Proposals (information)

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Please find attached the following certificate programs for your information:

*Graduate Certificate in Global Mine Waste Management*

*Graduate Certificate in Higher Education*

*Supplemental Certificate for Joint PhD between the University of British Columbia  
and the University of Stuttgart (UoS)*

Respectfully submitted,

Dr. Peter Marshall, Chair

Senate Curriculum Committee



## Graduate Certificate in Global Mine Waste Management

### Proposed name of Certificate Program:

Graduate Certificate in Global Mine Waste Management (GCGMWM)

### Date of Submission:

January 21, 2018

### Sponsoring Faculty/ Department/ School:

Faculty of Applied Science/ Department of Mining Engineering

### Contact Person:

Name: Dr. Dirk van Zyl  
Title: Professor, Mining Engineering  
Phone: 604-827-3462

Name: Dr. Davide Elmo  
Title: Curriculum Representative, Mining Engineering  
Phone: 604-822-9304

Name: Dr. Marek Pawlik  
Title: Graduate Advisor, Mining Engineering  
Phone: 604-827-5034

Name: Ms. Carmen Jensen  
Title: Director, MEng Program, Mining Engineering  
Phone: 604-822-4642

### Program Description:

The Graduate Certificate in Global Mine Waste Management (GCGMWM) is designed to meet the growing need for professional development of mining industry professionals focusing on tailings and mine waste management. Students will complete four 3 credit courses. Each course will be offered in a blended format with three parts:

- Part 1: online/ distance learning: 2 months
- Part 2: 2 weeks intensive campus session at UBC
- Part 3: final project online/ distance learning: 6 weeks

During year 1, students will complete:

- MINE 586 (3) - Advanced Mine Waste Management will be formalized (currently operating as MINE 590Q.) Topics include: production and material behavior of slurry, thickened, paste and filtered tailings; in-situ and laboratory characterization of tailings, mine waste rock and heap leach materials; life cycle management strategies of tailings, mine waste rock and heap leach facilities, including spent ore; and water management aspects of mine waste management facilities. Students will develop material characterization programs for mine waste materials; design an appropriate mine waste management program for a mine; and outline the basics of a water management system for mine waste management facilities.



- MINE 587(3) - Advanced Mine Site Management (new course); Topics include site and corporate governance and responsibility for mine waste facilities (specifically tailings), the role of the Engineer of Record; geochemistry of mine waste and mine closure realities. Students will develop a corporate governance and stewardship program for mine waste management; compile characterization and mitigation measures of acid drainage and metal leaching based on appreciation of the geochemistry of mine waste facilities; and develop and implement mine closure plans for mine waste management facilities.

During year 2, the students will complete:

- MINE 588 (3) - Risk Assessment for Mine Waste Management (new course); Topics include: Introduction to risk assessment; risk assessment methodologies- qualitative and quantitative; risk management; and decision-making under risk. Students will identify risks associated with mine waste facilities; develop risk assessments for mine waste facilities; and develop risk management plans for mine waste facilities.
- MINE 589 (3) - Mine Waste Management Case Studies (new course); The objective is to give students an understanding of the range of topics that require attention during the design, construction, operations and closure of mine waste facilities. Students will gain an understanding of the complexities of the mine waste management field, develop skills in integrated management and develop a better understanding of successes and failures in the industry.

After completing the certificate program, students have the option to ladder the course work into a master of engineering or master of applied science in mining engineering assuming that the student meets the admission requirements for the program. Both masters are offered by the Mining Engineering Department. The admission requirements are the same. The only difference is the master of applied science degree requires supervisor willing to take the student.

### **Rationale for the Program:**

Interest in Mine Waste Management is growing rapidly. The recent attention to tailings management initiated by the Mount Polley Tailings Dam Failure and the subsequent catastrophic failure in Brazil at Samarco has created a demand for more advanced course work for professionals in Mine Waste Management. This is an ideal topic for a Graduate Certificate Program as it is an opportunity for working professionals to upgrade their education and training to be able to address the more stringent requirements that are being put in place for tailings management, globally.

Currently there are no accredited graduate-level degree or certificate courses of study available that address this topic in the world. This proposed Certificate would be unique in the world.

### **Proposed length/ duration:**

12 credits- four required 3 credit courses.

Year 1- 2 courses

Year 2- 2 courses



Each 3 credit course is offered through a blended delivery program which includes online pre-meeting activities, an intensive two-week interactive face-to-face session, followed by a 6-8 week project.

The two-week face to face session will include presentations, tutorials and design activities plus a site visit to a local mine, examining the tailings facility. The face-time session is a great opportunity for students in the program to network with other professionals and share best practices. We recognize that the value of a cohort-based program is not only in the academic material provided and presented to students but also the sharing of expertise and best practices of professionals from around the world. The opportunity for students to be engaged in learning with regulators and professionals from all over the world is part of the value of the two-week face-to-face session.



### **Proposed curriculum topics:**

Required courses:

MINE 586- (3 credits) Advanced Mine Waste Management

MINE 587- (3 credits) Advanced Mine Site Management

MINE 588- (3 credits) Risk Assessment for Mine Waste Management

MINE 589- (3 credits) Mine Waste Management Case Studies

### **Target Learners:**

1. Engineers and geoscientists in the mining industry who are involved or seek to be involved in the mine waste and tailings management.
2. Students who have successfully completed MINE 480 or have the equivalent in experience and wish to complete the certificate.
3. Students who already have a master's degree in a related field who are interested in incorporating mine waste and tailings management into their careers.
4. Students who want to pursue further studies leading to a possible Master of Engineering in Mining Engineering.
5. Students who want to pursue further studies leading to a possible Master of Engineering in Tailings Management when it is available.

### **Student Admission Criteria:**

Criteria for admission to the certificate program will be the same as those required for admission to masters programs offered by the Mining Engineering Department at UBC. Currently the department offers a master of engineering degree and a master of applied science degree. Students admitted to M.A.Sc. and M.Eng. degree program normally possess a bachelor degree in mining engineering or a related area, and must meet general admission requirements for master's degree programs set by the Faculty of Graduate and Postdoctoral Studies. In addition, students should have taken an introductory course in soil mechanics like CIVL 210. Students should have a minimum GPA equivalent to B+.

### **Student Assessment/ Grading Methods:**

(from the UBC Department of Educational Studies, Order of Marking Standards

<http://edst-educ.sites.olt.ubc.ca/files/2013/05/Order-ofMarkingStandards-2013.pdf> )

### **A Level (80% to 100%)**

- A+ is from 90% to 100%. It is reserved for exceptional work that greatly exceeds course expectations. In addition, achievement must satisfy all the conditions below. \
- A is from 85% to 89%. A mark of this order suggests a very high level of performance on all criteria used for evaluation. Contributions deserving an A are distinguished in virtually every aspect. They show that the individual (or group) significantly shows initiative, creativity, insight, and probing analysis where appropriate. Further, the achievement must show careful attention to course requirements as established by the coordinator.
- A- is from 80% to 84%. It is awarded for generally high quality of performance, no problems of any significance, and fulfillment of all course requirements. However, the achievement does not demonstrate the level of quality that is clearly distinguished relative to that of peers in class and in related courses.



### **B Level (68% to 79%)**

This category of achievement is typified by adequate but unexceptional performance when the criteria of assessment are considered. It is distinguished from A level work by problems such as:

- one or more significant errors in understanding
  - superficial representation or analysis of key concepts
  - absence of any special initiatives
  - lack of coherent organization or explication of ideas
  - The level of B work is judged in accordance with the severity of the difficulties demonstrated.
- B+ is from 76% to 79%.
  - B is from 72% to 75%.
  - B- is from 68% to 71%

### **C Level (60% to 67%)**

The Faculty of Graduate Studies considers 60% as a minimum passing grade for graduate students. Students should check the University Calendar for information on what constitutes “Satisfactory Progress” for masters and doctoral students. In general, a grade of 68% must be maintained to remain in good standing. See the Faculty of Graduate Studies section of Calendar for more information.

(<https://www.grad.ubc.ca/faculty-staff/policies-procedures/grading-practices>)

- C+ is from 64% to 67%
- C is from 60% to 63%

### **Program Delivery Format:**

The GCGMWM program builds upon some existing courses and some courses that are in development. The courses will be offered in a blended format, which includes online material through Connect/ Canvas.

### **Marketing/ promotion Strategy:**

The GCGMWM program will be advertised on the Department website. Flyers will be distributed to mining companies and through InfoMine. The program will be promoted at mining academic conferences and conventions such as: AME BC Exploration Roundup, CIM, Metsoc CIM, CMP (Ottawa), PDAC, Minexpo, Tailings Management, Mine Sustainability, SAG, IMPC and SME. Alumni will be contacted and provided with updates and encouraged to promote within their companies.

### **Assessment of Impact on Departmental and University Resources:**

The GCGLMWM students will enroll in two existing MINE courses. Two additional courses will be required by year 2 of the program.

The target cohort size will be 25 participants per course, ensuring a manageable workload for faculty. Faculty involvement will include monitoring and participating in on-line discussion forums and assessment as well as lecturing during the two week intensive on-campus session. Grading of the final project for each course will be handled by the faculty. A team of two faculty members will work together on two courses in the first year. The second year they will be working on two additional courses. This will allow for effective team-teaching and facilitating if and when someone is required to travel or some other situation arises where they will have limited time or accessibility.



Applications will be directed to the Mining Master of Engineering Program Office and reviewed by the Director of the Master of Engineering Program in Mining Engineering and the Graduate Student Advisor.

**Assessment of Financial Viability:**

Given that this certificate builds on some existing resources the program is deemed to be financially sustainable and operate on a cost-recovery basis. If any revenue is incurred it will be used to support updating the curriculum.

**Fees:**

The program will charge a single tuition rate for international and domestic students. There will be a credit based tuition fee of \$1670 per credit.

In addition to per credit tuition students will be expected to pay a fieldtrip/ activity fee of upto \$3000 which will cover the following additional activities: 2 -3days, 1-2 nights fieldtrip (including accommodation, transportation and meals), networking event, and program swag. The amount will vary depending on the costs of the fieldtrip and cohort activities that are planned. The amount of this activity/fieldtrip fee will be listed in the admission letter each year.

**Current Program Advisory Committee Members**

Dr. Dirk van Zyl, Academic Lead and Professor, UBC Mining

Dr. Marek Pawlik, Graduate Advisor and Professor, UBC Mining

Dr. Michael Davies, Senior Advisor- Tailings and Mine Waste, Teck Resources Limited.

**Final Approval expected from the following Deans/ Department Heads**

Dr. James Olson, Dean, Faculty of Applied Science

Dr. Scott Dunbar, Head, Mining Engineering Department



## UBC Curriculum Proposal Form Change to Course or Program

### Category: 1

<p><b>Faculty:</b> Applied Science  <b>Department:</b> Mining Engineering  <b>Faculty Approval Date:</b> 1 March, 2018  <b>Effective Session (W or S):</b> S  <b>Effective Academic Year:</b> 2018</p>	<p><b>Date:</b> January 21, 2018  <b>Contact Person:</b> Dr. Dirk van Zyl          Academic Lead  <b>Phone:</b> 604-827-3462  <b>Email:</b> <a href="mailto:dvanzyl@mining.ubc.ca">dvanzyl@mining.ubc.ca</a>  <b>Contact Person:</b> Ms. Carmen Jensen          Director, Mining MENG Program  <b>Phone:</b> 604-822-4642  <b>Email:</b> <a href="mailto:carmen@mining.ubc.ca">carmen@mining.ubc.ca</a></p>
<p><b>Proposed Calendar Entry:</b></p> <p><i><b>The Faculty of Applied Science</b></i></p> <p><b>Contents</b></p> <p>Introduction→          Bachelor of Applied Science→          Co-operative Education Program→          Professional Associations→          Joint UNBC/UBC Program:          Environmental Engineering→  <b>Graduate Certificates Programs→</b>              • <b>Graduate Certificate in Global Mine Waste Management</b>              • <b>&lt;&lt;link to page created by the following proposal&gt;&gt;</b></p> <p>Master of Engineering→          Master of Engineering Leadership in Advanced Materials Manufacturing→          Master of Engineering Leadership in Clean Energy Engineering→          Master of Engineering Leadership in Dependable Software Systems→          Master of Engineering Leadership in Green BioProducts→          Master of Engineering Leadership in High Performance Buildings→          Master of Engineering Leadership in Integrated Water Management→          Master of Engineering Leadership in Naval Architecture and Marine</p>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,0,0">http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,0,0</a></p> <p><b>Present Calendar Entry:</b></p> <p><i><b>The Faculty of Applied Science</b></i></p> <p><b>Contents</b></p> <p>Introduction→          Bachelor of Applied Science→          Co-operative Education Program→          Professional Associations→          Joint UNBC/UBC Program:          Environmental Engineering→          Master of Engineering→          Master of Engineering Leadership in Advanced Materials Manufacturing→          Master of Engineering Leadership in Clean Energy Engineering→          Master of Engineering Leadership in Dependable Software Systems→          Master of Engineering Leadership in Green BioProducts→          Master of Engineering Leadership in High Performance Buildings→          Master of Engineering Leadership in Integrated Water Management→          Master of Engineering Leadership in Naval Architecture and Marine Engineering→          Master of Engineering Leadership in Smart Grid Energy Systems→          Master of Engineering Leadership in Urban Systems→</p>





Engineering→

Master of Engineering Leadership in

Smart Grid Energy Systems→

Master of Engineering Leadership in

Urban Systems→

Master of Health Leadership and Policy in

Clinical Education→

Master of Health Leadership and Policy in

Seniors Care→

Master of Software Systems→

Academic Staff→

Master of Health Leadership and Policy in  
Seniors Care→

Master of Software Systems→

Academic Staff→

**Type of Action:**

(e.g., new course, delete course, etc.)

- Add Graduate Certificates to Faculty of Applied Science section of Calendar
- Add Graduate Certificate in Global Mine Waste Management
- 

**Rationale for Proposed Change:**

- 1) The Faculty of Applied Science does not have Graduate Certificates listed in the Calendar, thus this section must be added to the calendar. Graduate Certificates will be administered by the Faculty of Applied Science so it is appropriate to list it in the Faculty's section.



<p><b>Proposed Calendar Entry:</b></p> <p><b>Graduate Certificate in Global Mine Waste Management</b></p> <p>The Graduate Certificate in Global Mine Waste Management is a 2 year, 12 credit specialized program for engineers and geoscientists on tailings and mine waste management.</p> <p>The program aims to prepare engineers from relevant disciplines and geoscientists to address challenges with mine waste management and contribute to finding solutions to issues associated with mine waste management, globally.</p> <p>Students who complete the certificate have the option of laddering the course work into masters programs offered by the Mining Engineering Department (master of engineering or master of applied science degree in Mining Engineering).</p> <p>To facilitate laddering, criteria for admission to the certificate program will be the same as those required for admission to master's programs offered by the Mining Engineering Department.</p> <p><b>Admissions Requirements:</b></p> <p>Criteria for admission to the certificate program will be the same as those required for admission to masters programs offered by the Mining Engineering Department at UBC. Currently the department offers a master of engineering (M.Eng.) degree and a master of applied science (M.A.Sc.) degree. Students admitted to M.A.Sc. and M.Eng. degree program normally possess a bachelor degree in mining engineering or a related area, and must meet general admission requirements for master's degree programs set by the Faculty of Graduate and Postdoctoral Studies. In addition, students should have taken an introductory course in soil mechanics like</p>	<p><b>URL: N/A</b></p> <p><b>Present Calendar Entry: N/A</b></p> <p><b>Type of Action:</b> Create new graduate certificate.</p> <p><b>Rationale for Proposed Change:</b> The Graduate Certificate in Mine Waste Management is a new program to be administered by the Faculty of Applied Science. Tailings and waste rock are ongoing management problems for the mining industry, yet there is no formalized training in the subject anywhere in the world. The Mount Polley tailings impoundment failure in British Columbia and the subsequent catastrophic tailings impoundment failure at the Samarco mine in Brazil have created an awareness of the need for more focused and advanced training of engineers in Mine Waste Management.</p>
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CIVL 210. Students should have a minimum GPA equivalent to B+.

**Certificate Requirements:**

All students must complete the following four courses (12 credits): MINE 586 (3), MINE 587 (3), MINE 588 (3), and MINE 589 (3).

Satisfactory progress as defined by the Faculty of Graduate Studies and Postdoctoral Studies for master's students must be maintained.

The requirements from

<https://www.grad.ubc.ca/current-students/managing-your-program/satisfactory-progress-masters-students> are listed below:

A minimum of 60% must be obtained in any course taken by a student enrolled in a master's program for the student to be granted pass standing. However, only 6 credits of pass standing may be counted towards a master's program. For all other courses, a minimum of 68% must be obtained.

If you have to repeat a failed required course, you must obtain a minimum mark of 74%. Higher minimum marks may be required by your graduate program or the Faculty of Graduate and Postdoctoral Studies.

If you do not improve your grade by repeating the course or taking an alternate course and obtaining a satisfactory grade, you may be required to withdraw from your graduate program.

If you obtain grades of 60-67% in an excessive number of courses (more than 6 credits) you may be required to withdraw. You will be informed of unsatisfactory academic progress in writing before any action regarding withdrawal is taken.

For master's students registered in the Faculty of Graduate and Postdoctoral Studies, a standing of Fail (F) will be assigned to courses with grades that fall below 60%.



Students must complete their requirements within 4 years of starting the program.

**Required:** CIVL 210 (4) or Introductory Soils Mechanics course;

**Recommended:** MINE 480 (3) (or applicable mine waste management design or operations experience or approval of the faculty).

**Proposed Name of Certificate Program: Graduate Certificate in Higher Education  
(version June 19, 2018)**

Approved by Faculty of Education March 29, 2018

**Sponsoring Faculty/Department/School**

Faculty of Education/Department of Educational Studies

**Contact Person**

Name	Lesley Andres
Title	Professor, Educational Studies
Telephone	604-822-8943
Email	lesley.andres@ubc.ca

**Supporting UBC Partners or External Partners**

We have not sought support from UBC Partners or External Partners.

**Program Description (maximum 250 words)**

The Graduate Certificate in Higher Education (GCHIED) is designed to meet the continuing professional development needs of those involved in the field of higher education. This certificate is designed for individuals teaching, supporting, or in monitoring roles in public and private institutions of higher education in British Columbia and beyond. Such individuals may include faculty; staff working in higher education (e.g., academic advisors, registrar's office staff, student services staff); and employees from government or funding agencies. Students will complete 12 credits of coursework on the following topics: an introduction to the field of higher education; the historical, philosophical, economic, and sociological foundations of higher education; organization and administration of higher education; and higher education systems in Canada. Three courses will be face to face and one will be offered online. Face to face sessions will be held on the UBC-V campus in the evenings (or some weekends) to allow for participation of students who are working during the day.

There are many people involved in the provision of higher education who wish to strengthen and deepen their knowledge base in this area. Others want to complete a series of courses shorter than a complete full graduate degree program. Many professionals who are actively engaged in the day-to-day activities of universities, colleges, other institutions of higher education, and related institutions, would benefit from increasing their knowledge of the key principles underpinning higher education. This certificate would meet their continuing professional learning needs. The certificate could ladder into a full master's degree program for those wishing to complete their graduate degree. Students completing the certificate will acquire a credential that is recognized by employers and thus could improve their career prospects and broaden their employment opportunities.

This graduate certificate has important revenue implications for the Department, Faculty and University. It introduces a new revenue stream by adding an intermediary credential between undergraduate and graduate degrees that will be accessible and of particular interest to practicing professionals who wish an academically focused form of professional development. The certificate will also recruit students to the M.Ed. in Higher Education and the higher education concentration in the MA in the Department of Educational Studies, as well as increasing the number of students enrolled in our courses. This certificate fits well with the University's flexible and professional learning initiatives, and establishes an important model for other programs. The graduate certificate is a credential that is recognized by employers and thus could improve their career prospects and broaden their employment opportunities.

**Proposed Length (indicate hours, credits, months, etc.)**

12 credits (four required 3-credit courses)

Each three-credit course involves 39 hours of classroom time. Winter term courses are usually held one evening a week for three hours for 13 weeks. Summer term 1 courses are held twice a week for 6-7 weeks and summer term 2 courses run daily, Monday to Friday, 3 hours each day for three weeks. For students taking one course per term, the certificate could be completed in four terms as outlined below. It could be completed in less time for those able to take more than one course per term.

**Required Courses**

EDST 493	Introduction to the Study of Higher Education
EDST 511	Organization and Administration of Higher Education
EDST 521	Foundations of Higher Education
EDST 536	Higher Education Systems in Canada

**Target Learners**

1. Students who want to pursue graduate studies in Higher Education at the Certificate level;
2. Students who already have a master's degree in an area other than Higher Education who are taking on adult learning responsibilities in their current work and desire additional education related to their duties;
3. Students who want to take higher education courses prior to applying for a M.Ed. or M.A.

**Student Admission Criteria**

Criteria for admission to the Certificate program will be the same as those required for admission to masters programs at UBC as outlined by the Faculty of Graduate Studies and the requirements for admission to the M.Ed. program in Higher Education. Graduates of the Certificate program will be required to apply to the M.Ed. or the M.A. program if they wish to pursue further studies in this area (i.e., admission to the master's program is not automatic once the Certificate is completed). Once admitted to the M.Ed. or to the M.A. program,

19 Students may apply to have their 12 credits of their GCHIED courses transferred to the degree program into which they were admitted.<sup>1</sup>

### **Program Delivery Format**

The GCHIED program builds upon existing courses. Courses will be delivered on the UBC-V campus. The required courses are already offered on campus on a flexible schedule (they are normally offered on weekday evenings, sometimes on weekdays and sometimes on Saturdays) designed to enable greater student participation.

### **Marketing/Promotion Strategy**

The GCHIED will be advertised on the EDST website and flyers will be developed and distributed to relevant organizations such as post-secondary institutions, government, and other institutions related to higher education endeavours.

### **Assessment of Impact on Departmental and University Resources**

GCHIED students will attend existing courses and thus no new curriculum development is required; if large numbers of students are accepted into GCHIED this may result in the hiring of sessional faculty to teach extra sections. Involvement of faculty and staff in the compilation and assessment of applications will increase slightly. Applications will be directed to the Department of Educational Studies. Academic oversight and review of applicants will be undertaken by faculty members in the Higher Education program in the Department of Educational Studies. Revenue generated may help to provide bursaries and curriculum development such as the possibility of summer institutes.

### **Assessment of Financial Viability**

Given that this certificate builds on existing resources, the program is deemed to be financially sustainable and may generate additional resources to assist with upgrading and updating the curriculum. (The SDS budget spread sheet is being prepared).

### **Fees**

The total cost of the program is \$5555.76 for domestic students and \$6964.56 for international students.

**Program Description:** Graduate Certificate in Higher Education  
**Start Date of the Program:** 2019 Summer Session 1

**Program Description:** Graduate Certificate in Higher Education  
**Start Date of the Program:** 2019 Summer Session 1

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	Domestic	International
Proposed Tuition Fees – Note 1		
EDST 493, EDST 511, EDST 521, EDST 536	\$462.98 per credit	\$580.38 per credit
Minimum No. of Instalments	Not Applicable	Not Applicable
Amount per Instalment	Not Applicable	Not Applicable
Continuing Fees per Instalment	Not Applicable	Not Applicable
Application Fees – Note 2	\$102.00	\$165.00

Note 1. The tuition for each course will be subject to annual tuition increases as established by the University.

Note 2. This is the current standard rate for applications for Faculty of Education certificate programs and is subject to annual increases.

Note 3: Certificate may require a payment to the department offering the certificate.

### ***Costs of comparable programs***

The University of Manitoba's Certificate in University and College Administration fee per course is \$560 (each course is 25 hours long vs. the UBC GCHIED where each course is 39 hours long). The University of Toronto, OISE, offers a Certificate in Leadership in Higher Education Half Course Fee is \$1,495.

### **Current Program Advisory Committee Members (list names and affiliations)**

Lesley Andres, Professor, Higher Education

Amy Metcalfe, Associate Professor of Higher Education

### **Final Approval Expected from the Following Deans/Department Heads**

Dr. Blye Frank, Dean of Education

Ali Abdi, Head of the Department of Educational Studies



## UBC Curriculum Proposal Form Change to Course or Program

### Category: 1

<p><b>FACULTY:</b> EDUCATION  <b>Department:</b> Educational Studies  <b>Faculty Approval Date:</b> March 29, 2018  <b>Effective Session (W or S):</b> W  <b>Effective Academic Year:</b> 2018</p>	<p><b>Date:</b> June 12, 2017  <b>Contact Person:</b> Lesley Andres  <b>Phone:</b> 604-822-8943  <b>Email:</b> lesley.andres@ubc.ca</p>
<p><b>Proposed Calendar Entry:</b></p> <p><b>Graduate Certificate in Higher Education</b></p> <p>The Graduate Certificate in Higher Education GCHIED is designed to meet the continuing professional development needs of those involved in the field of higher education. This certificate is intended for individuals teaching, supporting, or monitoring roles in public and private institutions of higher education in British Columbia and beyond. Students will complete coursework on the following topics: an introduction to the field of higher education; the historical, philosophical, economic, and sociological foundations of higher education; organization and administration of higher education; and the Canadian systems of higher education.</p> <p><b>Admission</b></p> <p>Language proficiency requirements, will be the same as for the Master of Higher Education <a href="http://www.grad.ubc.ca/prospective-students/graduate-degree-programs/master-of-education-educational-studies">www.grad.ubc.ca/prospective-students/graduate-degree-programs/master-of-education-educational-studies</a></p> <p>Students studying in the GCHIED program may apply for admission to the MEd in Higher Education and transfer up to four certificate courses (12 credits) towards completion of the MEd program.</p>	<p><b>URL:</b>  <a href="http://www.calendar.ubc.ca/Vancouver/index.cfm?tree=12,202,430,0">http://www.calendar.ubc.ca/Vancouver/index.cfm?tree=12,202,430,0</a></p> <p><b>Present Calendar Entry:</b>  n/a</p> <p><b>Type of Action:</b>  New graduate certificate</p> <p><b>Rationale for Proposed Change:</b>  There are many people involved in the provision of higher education who wish to strengthen and deepen their knowledge base in this area. Others want to complete a series of courses shorter than a complete full graduate degree program. Many professionals who are actively engaged in the day-to-day activities of universities, colleges, other institutions of higher education, and related institutions, would benefit from increasing their knowledge of the key principles underpinning higher education. This certificate would meet their continuing professional learning needs. The certificate could ladder into a full master's degree program for those wishing to complete their graduate</p>

**Certificate Requirements**

All students must complete EDST 493 (3); EDST 521(3); EDST 511 (3); and EDST 536 (3).”

Satisfactory progress as defined by the Faculty of Graduate Studies for master’s programs must be maintained. Students must complete their requirements within 5 years of admission.

# memo

To: Graduate Curriculum Committee

From: Susan Porter, Dean, Faculty of Graduate and Postdoctoral Studies

Date: May 23, 2018

Re: Supplemental Certificate for Joint PhD between the University of British Columbia and the University of Stuttgart (UoS)

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I am writing to request approval of the attached document (Appendix A) in relation to joint PhD graduates under the partnership between UBC and the UoS.

## Background

Since 2009, UBC has offered the ability for individual students to enter a collaborative academic program of scholarship and research, jointly designed, supervised and examined by faculty from UBC and another university. It is a single doctoral degree offered jointly by the two universities. Each joint doctoral program is based on an existing PhD, EdD, or DMA program at UBC and all existing program requirements must be met in order to be awarded a joint PhD.

Per the Joint PhD Agreement, already approved by Senate, graduates can choose between a single degree certificate with crests from each university or separate certificates from each university. Wording on the certificate(s) and transcripts must state the degree is “Awarded as a single degree under a Joint PhD arrangement” and include the names of both universities.

No change is being requested to this approach nor is a new program being proposed. Request

The Memorandum of Understanding attached as Appendix B was developed in consultation with representatives of:

- Faculty of Graduate and Postdoctoral Studies
- Office of the Vice-Provost, International
- UBC Department of Physics and Astronomy
- Stewart Blusson Quantum Matter Institute at UBC
- Max Planck Institute for Solid State Research (MPI)

The MOU relates to the implementation of a joint PhD arrangement between UBC and UoS, with the support of MPI.

Because the traditional UBC parchment recognizes only the involvement of the two universities, a supplemental document has been proposed in recognition of the invaluable contributions of MPI in this strategic partnership. The parties to the MOU therefore request Senate approval to offer joint PhD graduates the document attached as Appendix A in addition to the traditional form of degree.



19 September 2018

a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

Vancouver Senate

Docket Page 252 of 267



Stewart Blusson

Quantum Matter Institute

THE UNIVERSITY OF BRITISH COLUMBIA

Max Planck Institute for Solid State Research  
Stuttgart, GermanyUniversity of Stuttgart  
Germany

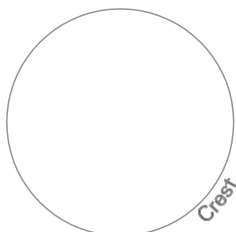
# Joint PhD Certificate

This is to certify that

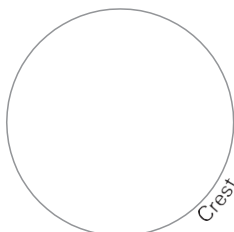
**Jörg Mustermann**

born September 15, 2017 in Stuttgart has undertaken and fully completed the graduate training programme offered at the Max Planck – UBC – UTokyo – Centre for Quantum Materials in the course of his Ph.D. studies at the University of Stuttgart - Germany / University of British Columbia - Canada.

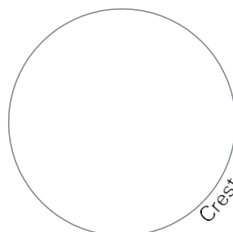
## Angle-Resolved Photo imaging of Novel Quantum Materials

**Dr. Susan Porter**Dean and Vice-Provost  
Graduate and Postdoctoral Studies  
University of British Columbia  
Vancouver/Canada**Prof. Dr. Andrea Damascelli**Co-Director UBC Quantum Matter Institute  
Stewart Blusson Quantum Matter Institute  
Vancouver/Canada**Prof. Dr. Bernhard Keimer**Co-Director UBC Quantum Matter Institute  
Max Planck Institute for Solid State Research  
Stuttgart/Germany**Prof. Dr.-Ing Dr.h.c. Wolfram Ressel**Rector  
University of Stuttgart  
Stuttgart/Germany

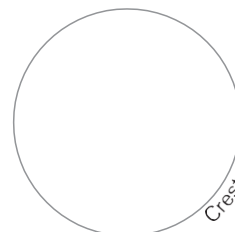
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Crest



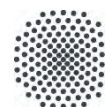
Crest

Stuttgart, April 4, 2018

The University of British Columbia 170-6371 Crescent Road Vancouver, BC V6T 1Z2, Canada  
Stewart Blusson Quantum Matter Institute 2355 East Mall Vancouver, BC, V6T 1Z4, Canada  
Max Planck Institut for Solid State Research, Heisenbergstrasse 1, 70569 Stuttgart, Germany  
University of Stuttgart, Keplerstrasse 7, 70174 Stuttgart, Germany



THE UNIVERSITY  
OF BRITISH COLUMBIA



Universität Stuttgart

## MEMORANDUM OF UNDERSTANDING BETWEEN

### THE UNIVERSITY OF BRITISH COLUMBIA ("UBC")

6328 Memorial Road, Vancouver, BC, V6T 1Z2 Canada

AND

### THE UNIVERSITY OF STUTTGART ("UoS")

Keplerstraße 7, 70174 Stuttgart, Germany

AND

### THE MAX PLANCK INSTITUTE FOR SOLID STATE RESEARCH ("MPI")

Heisenbergstraße 1, 70569 Stuttgart, Germany

Each Party an "Institution" and all Parties the "Institutions"

IN ORDER to strengthen the relationship between the Institutions and in order to encourage cooperation between the Institutions in the areas of Quantum Materials in Condensed Matter Science education and research through a Joint PhD;

#### 1) PURPOSE AND DEFINITIONS

- i. The Institutions agree to support the implementation of a Joint PhD in the areas of Quantum Materials in Condensed Matter Science in accordance with the terms and regulations laid out in this Memorandum of Understanding including its supporting documents.
- ii. This Memorandum of Understanding defines a general framework for a Joint PhD between UBC, UoS, and MPI.

- iii. MPI being a non-degree granting Institution, the PhD degree will be awarded jointly by the two participating universities, UBC and UoS.
- iv. For each student pursuing a Joint PhD between UBC, UoS and MPI, a separate and legally binding agreement must be signed by both UBC and UoS as the degree granting institutions, prior to the student advancing to candidacy. This separate and legally binding document, or most recent version thereof per the UBC Faculty of Graduate and Postdoctoral Studies, is entitled "JOINT PHD AGREEMENT" (See Appendix A).

## **2) IMPLEMENTATION GUIDELINES**

- i. The selection procedure for Joint PhD students shall follow all institutional procedures, but the quality requirements should in no case be lower than those for any one of the Institutions. A joint PhD student's application, enrolment, and academic program must meet the PhD requirements of both UBC and UoS.
- ii. Each joint PhD student and their course of study/research project will be approved on an individual basis by the Institutions. The completion and approval of the JOINT PHD AGREEMENT (see Appendix A) is required for each Joint PhD student.
- iii. Each Joint PhD student is required to spend a minimum of one year at each university. During this period, the Joint PhD student will share the same rights and obligations as regular PhD students of the university.
- iv. The progress of each Joint PhD student should be assessed annually by a joint thesis advisory committee.
- v. Each joint PhD research project should be formulated in collaboration between scientists at UBC, UoS and MPI. Each joint PhD student must have supervisors and research supervisory committee members from each of the two universities (ie: UBC and UoS). Details will be developed by a joint working group composed of members of the Institutions and set out in the completed JOINT PHD AGREEMENT.
- vi. The joint PhD student shall submit his/her thesis for assessment at both UBC and UoS following each of the Institution's procedures and requirements. However, a single common assessment and thesis defense must be conducted in order to qualify for a joint PhD degree.

## **3) PROVISIONS REGARDING STUDENTS**

- i. The Institutions agree that the implementation of each student's Joint PhD is governed by the JOINT PHD AGREEMENT executed by UBC and UoS without reference to provisions in this Memorandum of Understanding, in accordance with each university's academic requirements and regulations.

- ii. While the Institutions agree to identify potential Joint PhD students, nothing in this Memorandum of Understanding obligates any of the Institutions to accept a certain number of students.

#### **4) GENERAL PROVISIONS**

- i. While the Institutions intend to cooperate with respect to the foregoing activities, no Institution will be obligated to commit funds or resources, nor will an Institution grant any rights with respect to intellectual property, unless a legally binding agreement has been entered into.
- ii. This Memorandum of Understanding does not itself establish any legally binding obligations, financial or otherwise, on the part of any Institution.
- iii. Any disagreement relating to the interpretation of the provisions of this Memorandum of Understanding shall be resolved between the Institutions.

#### **5) DURATION AND NOTICE**

- i. The Institutions intend to initiate the Joint PhD offering in September, 2018, for a ten year period commencing on the date set out below, with an evaluation by a joint review committee after five years.
- ii. If the Memorandum of Understanding is not renewed after the evaluation, it will end when the final PhD candidates complete their degree.
- iii. After the end of the ten-year term, the Memorandum of Understanding can be renewed upon agreement of the Institutions.
- iv. Any of the Institutions may terminate this Memorandum of Understanding by providing at least 100 days' notice to the other Institutions. Collaborative projects that are already in process at the time of termination are not considered to be automatically terminated. The process for such projects must be individually discussed to ensure minimum effect on each.
- v. Termination shall be without penalty or obligation to any of the Institutions. No Institution will be liable to the other under this Memorandum of Understanding for any claims or losses whatsoever.

#### **6) USE OF TRADENAMES**

- i. The name, crests and logos of each Institution are the intellectual property of that Institution, and may not be used without that Institution's express written permission for each specific usage.

Dated this \_\_\_\_ day of \_\_\_\_\_, 2018

**For The University of British Columbia:**



THE UNIVERSITY  
OF BRITISH COLUMBIA

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Professor Santa J. Ono  
President and Vice-Chancellor

**For The University of Stuttgart:**



Universität Stuttgart

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name  
title

**For The Max Planck Institute for Solid State Research**



MAX-PLANCK-GESellschaft

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name  
title



**Appendix A****“JOINT PHD AGREEMENT”**

**JOINT PHD AGREEMENT** made effective this      day of      20     

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**BETWEEN:**

**THE UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER BC CANADA V6T 1Z1 AND:**

**NOTE:** This is not an application form for a PhD program. Applicants not currently enrolled at the University of British Columbia (“UBC”) must submit a separate application for admission to a UBC PhD program.

<b>UBC Student No.:</b>	
<b>Family Name:</b>	<b>Given Names:</b>
<b>Mailing Address:</b>	
<b>Email:</b>	<b>Phone number(s):</b>
<b>Previous degrees/qualifications:</b>	
<b>UBC Graduate Program:</b>	
<b>Partner University:</b>	
<b>Name of Department/Graduate Program at Partner Institution:</b>	
<b>Which will be the Lead University?</b>	

**1. Evidence of ongoing or developing research collaboration including any existing Joint PhD agreements:**

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**2. Research topic:**

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**3. Academic rationale for utilizing a Joint PhD arrangement to realize the student's research program:****4. Supervisors, qualifications, and their supervisory experience to completion: UBC:**

Co-supervisor:

Additional supervisory committee member(s):

**5. Supervisors, qualifications, and their supervisory experience to completion: Partner University:**

Co-supervisor:

Additional supervisory committee member(s):

**6. Expected period of residency at each university (minimum 12 months at each institution):**

NOTE: List specific periods of time, e.g., Visit 1: mm/yy to mm/yy. Visit 2: mm/yy to mm/yy etc.

UBC:

Partner Institution:

**7. Proposed language of thesis:****8. Coursework required (enter specific courses to be taken) and location to be completed:****9. Comprehensive exam requirement and format: (Required)****10. PhD Examination. The examination of dissertation and student will be coordinated by the Lead University and must meet therequirements of both universities.**

UBC policy requires that a doctoral dissertation be examined by a qualified examiner who is external to both universities.

The student must also have an oral examination before an examining committee that includes examiners from outside of the supervisory committee.

UBC policy for PhD examination, including oral defense: [www.grad.ubc.ca/current-students/final-doctoral-exam/examination-committee](http://www.grad.ubc.ca/current-students/final-doctoral-exam/examination-committee).

UBC requirements for dissertation preparation and submission: [www.grad.ubc.ca/current-students/dissertation-thesis-preparation](http://www.grad.ubc.ca/current-students/dissertation-thesis-preparation) AND [www.grad.ubc.ca/current-students/final-dissertation-thesis-submission](http://www.grad.ubc.ca/current-students/final-dissertation-thesis-submission).

10a. Is an External Examiner required at the Partner University?

☐

Yes

☐

No 10b. Proposed

composition of Examining Committee (names of specific individuals not necessary):

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10c. Proposed location of oral examination:

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**11. Arrangements for payment of fees** (Normally, tuition is paid at Lead University throughout the program. Other mandatory student fees are normally paid at the university where the student is resident in a given term. Unless stated otherwise below, the university at which tuition or student fees are paid will retain those fees for its own use):

Tuition to be paid at:

Mandatory student activity fees to be paid at:

**12. Arrangements for financial support for student:**

Scholarship/stipend:

Travel support:

**13. Arrangement of financial support for supervision/examination:**

Supervisor travel:

Examiner travel:

Videoconferencing, etc.:

**14. Proposed form of Degree Awarded:** It is agreed that if successful, the student will be awarded a single doctoral degree. The degree will be represented by (choose one):

☐ A single degree certificate with crests from each university. It is the responsibility of the Lead University to produce this certificate.

☐ Separate certificates from each university.

Wording on certificate(s) and transcripts must state that the degree is “Awarded as a single degree under a Joint PhD arrangement” and include the names of both Lead and Partner universities.

**15. Additional Terms of Reference:** The Additional Terms of Reference attached hereto as Schedule “A” apply to this Joint PhD project and form part of this Joint PhD agreement.

**16. Enuring Effect:** This agreement shall enure to the benefit of and be binding upon the parties hereto and their representatives, successors and other legal representatives.

Contact Details of Degree Administrator: UBC	
<b>Name:</b> Student Academic Services	<b>Email:</b> graduate.sas@ubc.ca
<b>Phone:</b> (604) 822-2848	<b>Fax:</b> (604) 822-5802
Contact Details of Degree Administrator: Partner University	
<b>Name:</b>	<b>Email:</b>
<b>Phone:</b>	<b>Fax:</b>

**Non-UBC University:**Lead ☐ or Partner ☐

<b>1) Lead Supervisor:</b>			
Name:	Signature:		Date:
<b>2) Additional signatory (if required) at Non-UBC University:</b>			
Name:	Title:	Signature:	Date:
<b>3) Additional signatory (if required) at Non-UBC University:</b>			
Name:	Title:	Signature:	Date:
<b>4) Additional signatory (if required) at Non-UBC University:</b>			
Name:	Title:	Signature:	Date:

**University of British Columbia**Lead ☐ or Partner ☐

<b>5) Lead Supervisor:</b>		
Name:	Signature:	Date:
<b>6) Dean of Relevant Faculty:</b>		
Name:	Signature:	Date:
<b>7) Dean of Graduate and Postdoctoral Studies:</b>		
Name:	Signature:	Date:
<b>8) Provost &amp; Vice-President, Academic (or designate):</b>		
Name:	Signature:	Date:
<b>9) Additional signatory required at UBC:</b>		
Name:	Signature:	Date:

**Acknowledgment and Consent of Student**

I, the undersigned, hereby:

1. Acknowledge and understand the requirements for my PhD studies as set out in this Joint PhD agreement and the applicable rules, regulations and policies of the two universities;
2. consent to the processing of my personal information and the transfer of such information between the two universities for all purposes in conjunction with my PhD studies and this Joint PhD agreement; and

3. understand that my personal information is collected by UBC under the authority of section 26(c) of the Freedom of Information and Protection of Privacy Act (British Columbia) and that if I have any questions about the collection, I may contact the Faculty of Graduate and Postdoctoral Studies at [jennifer.fletcher@ubc.ca](mailto:jennifer.fletcher@ubc.ca).

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Date: \_\_\_\_\_

DRAFT

## **Schedule “A”**

### **Additional Terms of Reference**

#### **ADMINISTRATIVE TERMS**

#### **Article 1: Joint Degree**

1.1 The two universities identified as the “Partner University” and the “Lead University” agree to jointly award a single PhD degree upon the student’s successful completion of the approved collaborative PhD education and research program described in this Joint PhD agreement.

#### **Article 2: Lead and Partner University**

2.1 The Lead University is responsible for the overall administration of the student’s work and the final examination process.

2.2 Regarding the different nomenclatures for doctoral degrees in different locations, the Lead University shall determine the nomenclature adopted for the jointly awarded degree in cases where only one degree parchment is created.

2.3 The student shall be bound by the policies of both universities.

2.4 Not less than one calendar year of the doctoral study period will be spent at each of the two universities.

#### **Article 3: Sharing of information**

3.1 Personal information of the student will be shared between the two universities to facilitate admission, enrolment, etc. for the Joint PhD program. Each university will obtain the necessary student consents for the processing of their personal information and the transfer of such information between the two universities for all purposes in conjunction with their PhD studies and this Joint PhD agreement.

#### **Article 4: Student Discipline, Academic Progress and Appeals**

4.1 Decisions on disciplinary matters associated with violations of academic policy or student conduct and discipline standards, and decisions with respect to the student’s academic progress, including any appeals of such decisions, shall be made according to the existing policies and requirements at each university. The universities may consult on specific issues and shall cooperate with each other in investigating any complaints submitted by the student, where possible; however, each university will adjudicate cases independently. Either university may make a decision that will have the effect of requiring the student to withdraw from the Joint PhD program. In such case either university may exercise its discretion to allow the student to continue in one of its other programs in accordance with the policies of that university.

#### **Article 5: Insurance**

5.1 Mandatory student fees paid by the student to a university may provide health insurance coverage while the student is attending that university, subject to certain limitations under that university’s health insurance policy. Notwithstanding the foregoing, it is the sole responsibility of the student to ensure that they obtain adequate insurance coverage to meet their needs for the time the student is enrolled in the Joint PhD program, including any travel abroad.

#### **Article 6: Intellectual Property**

- 6.1 Unless agreed to otherwise by the universities in writing, in the event that intellectual property is created as a result of this Joint PhD project, the universities shall work together in good faith to determine their relative contributions of ownership of, the division of any proceeds arising from, and the institution that will be responsible for managing the protection and exploitation of, such intellectual property.
- 6.2 The student is required to indicate the affiliation with both universities in any work published as a result of this Joint PhD project. All other authorship and publication matters with respect to work produced by the student in the context of this Joint PhD project shall be in accordance with good scholarly practices and the policies of each university.

## **PEDAGOGIC TERMS**

### **Article 7: Supervision**

- 7.1 The supervision and training of the student will be provided by two co-supervisors, one from each university. Each of these individuals must be authorized to act as a doctoral supervisor at their respective university. In addition, it is expected that a supervisory committee, consisting of the two supervisors and at least two other individuals qualified to be a supervisor under both universities' policies, will be established to provide broad guidance and approval of the student's research. Meetings of the supervisory committee may take place by way of videoconference.
- 7.2 The co-supervisors will provide the resources necessary to permit the realisation of the research for the duration of this Joint PhD agreement, within the limits of available funds.
- 7.3 The co-supervisors will fully exert their function of supervisor in relation to the student and will consult with each other regularly to support the progression of the Joint PhD project. The co-supervisors will hold an actual or virtual meeting with the student at least once a year for the duration of the Joint PhD project. Supervision meetings at the university where the student is currently studying shall be held at regular intervals.
- 7.4 The research will be carried out at the two universities in accordance with the provisional schedule provided in this Joint PhD agreement. If required, this schedule may be varied by written agreement of the two universities provided that the student is given reasonable notice of such changes.

### **Article 8: Degree requirements**

- 8.1 Joint PhD students must satisfy the admission requirements of, and be admitted by, both universities. The student must also meet all academic requirements of the doctoral degree at each university. At UBC, this includes a comprehensive examination, normally completed within two years of enrolment, and may include coursework.
- 8.2 The student's overall academic program, as stipulated in this Joint PhD agreement, shall be subject to the normal quality assurance policies and procedures of both universities, including but not limited to the normal annual academic audit or review processes, and the two universities will work together to ensure the program meets their expected standards.
- 8.3 Degree requirements will be carried out at the two universities accordance with the provisional schedule provided in this Joint PhD agreement. Degree requirements must be completed within six years of initial registration in the doctoral program. Extensions may be granted with the permission of both universities in accordance with their policies.



## Article 9: The Examination

9.1 The Lead University will be responsible for the administration of the final doctoral examination, and will be the location for the oral defense. The consideration of the thesis and the doctoral examination, including the composition of the examination committee, must comply with the policies and requirements of both universities, unless otherwise agreed by the universities in writing.

9.2 The thesis will be prepared and formatted for examination and final submission according to the applicable policies and regulations of the Lead University.

9.3 An examiner that is external to both universities must have a fundamental role in the evaluation of the thesis. The exact composition of the examining committee must be approved by the Partner University at least six weeks prior to the examination.

9.4 It is the student's responsibility to provide all necessary documents, including the report of the external examiner and the final recommendation of the examining committee to each of the two universities' administration, according to the rules in force at the two universities.

## Article 10: Degree Conferral and Graduation

10.1 Upon completion of all degree requirements and related administrative processes, the universities agree to jointly award a single doctoral degree. There will be either one degree parchment with the names and insignia of both universities, the form of which must be approved by both universities OR two degree parchments, one from each university and each stating the degree was awarded as a single degree under a Joint PhD arrangement with <name of other university>.

10.2 The student may elect to attend graduation ceremonies at either or both universities, subject to the regulations and procedures of each university.

## Article 11: Official Filing

11.1 The student's thesis must be submitted to both universities through their normal mechanisms. At

UBC, all theses are submitted electronically to UBC and published in the digital institutional repository, cIRcle, and Library and Archives Canada.

11.2 UBC has policies regarding an embargo period for releasing doctoral theses to the public domain. Any requested embargo period must be approved by both universities.

## Article 12: Use of Name and Trademarks

12.1 Neither university grants the other the right to use its name, crests or logos in any way without the prior written consent from the other. Each university has the right to specify the form and manner in which its name, crests and logos are used by the other. Should a university request in writing that the other cease using its name, crests or logos in a particular manner, the other university shall cease such use immediately.

## Article 13: Duration of the Agreement and General Terms

13.1 Notwithstanding its signature by all the parties, this Joint PhD agreement comes into effect on the date first written above and will continue until the termination of the student's enrolment in the Joint PhD program, whether by way of completion of or withdrawal from the Joint PhD program.

13.2 In the event that any matters related to this Joint PhD agreement are in dispute between the two

universities, each university's Dean (or equivalent position) of the faculty in which the student is enrolled in the Joint PhD program shall promptly but in any case, within twenty one (21) days, make a bona fide attempt to resolve such dispute.

13.3 These terms are in addition to, and not in substitution of, the rules of the universities applicable to the student.

13.4 Any provisions of this Joint PhD agreement that by their nature operate beyond the expiry or termination of this Joint PhD agreement shall survive such expiration or termination.

13.5 This Joint PhD agreement, any schedules and any modifications to such schedules constitute the entire agreement between the parties with respect to the Joint PhD project and no amendment of this Joint PhD agreement will be valid unless such amendment is in writing and signed by both parties

13.6 This Joint PhD agreement may not be assigned by either party without the prior written consent of the other party.

13.7 This Joint PhD agreement may be executed in counterparts and by facsimile, each of which will be considered an original, and together will be considered one and the same document

13.8 This Joint PhD agreement shall enure to the benefit of and be binding upon the parties hereto and their representatives, successors, permitted assigns and other legal representatives.



To: Senate  
From: Registrar  
Re: Confirmation of Email Consent to Nominating Committee Recommendations  
Date: 6 September 2018

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This is confirmation that no objections were received to the following motions distributed to all senators via email and thus both resolutions were approved pursuant to rule 24 of the *Rules and Procedures of Senate* as of the date specified:

*“That Dr Merje Kuus be appointed to a President’s Advisory Committee for the Selection of a Vice-President, External Relations.” (4 July 2018)*

*“That Dr Paul G. Harrison be appointed to a President’s Advisory Committee for the Selection of a Vice-President, Students.” (11 June 2018)*