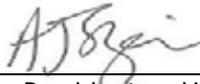


SUBJECT	BACHELOR OF PHARMACEUTICAL SCIENCES (BPSC)
MEETING DATE	APRIL 2, 2019

Forwarded on the Recommendation of the President

**APPROVED FOR
SUBMISSION**



for Santa J. Ono, President and Vice-Chancellor

DECISION REQUESTED	IT IS HEREBY REQUESTED that <i>approval be granted for 2019-2020 domestic and international tuition for the Bachelor of Pharmaceutical Sciences program, as set out in Attachment 1.</i>
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Report Date	March 13, 2019
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Presented By Andrew Szeri, Provost and Vice-President, Academic
 Simon Bates, Associate-Provost Teaching and Learning
 Michael Coughtrie, Dean, Faculty of Pharmaceutical Sciences

EXECUTIVE SUMMARY

The Faculty of Pharmaceutical Sciences is proposing the development of a new Bachelor of Pharmaceutical Sciences (BPSc). The BPSc will be an undergraduate program with direct entry from high school. Program graduates will take up technical positions in the discovery, development, and production areas of the pharmaceutical industry, or further their education through graduate studies.

Students will graduate competent in the knowledge and practical skills of the Pharmaceutical Sciences together with being able to demonstrate teamwork, leadership, entrepreneurial and ethical behaviours; this will allow graduates to contribute to economic, social and political aspects of society as a whole. Unique aspects of the program include the option of a one-term practicum placement in year 4, which will be 100% on-site with an industry partner. Placements will be in the pharmaceutical, nutraceutical, dietary supplement, personal care products (makeup, shampoo, etc.), technology and biotechnology industries. Another notable aspect to this program is the highly technical laboratories where instruction will be given in making nanoparticles and formulating gels, creams and mixtures.

Employment prospects include biotechnology and pharmaceutical industries, government affairs, relations and policy, regulatory affairs, industrial manufacturing, the personal care product and nutraceutical industries, health care and allied health care professions and transition to academic research. There is a large amount of enthusiasm and buy-in from the technology, biotechnology and pharmaceutical industry in B.C. and beyond as demonstrated by their positive responses to the Faculty's survey, active assistance in designing aspects of our curriculum, and commitment to accepting students for practical experiences in the coming years.

With an anticipated launch date of September 2020, the BPSc will be assessed at the standard undergraduate per credit amount for domestic and international students. For 2019/20, the approved standard per credit rates are \$179.97 for domestic and \$1,306.58 for international students. Rates for this program will be aligned with standard undergraduate per credit amounts, which are subject to general tuition increases as approved by the Board of Governors. The proposed lab fee will be \$1,500 per year level during Years 2-4 of the program.

Attachments

1. Tuition and Fee Assessment Details
2. Student Tuition Consultation Report

STRATEGIC CORE AREAS SUPPORTED

People and Places Research Excellence Transformative Learning Local / Global Engagement

DESCRIPTION & RATIONALE

The BPSc will be a four-year 120-credit program offered in person at UBC Vancouver. Students may choose General Studies (a taught degree), Research Focus (Research Project or Practicum Experience in Year 4) or Honours with Research focus (Research Project or Practicum Year 4 plus additional 12 credits taught courses, totalling 132 credits). The program will be delivered through traditional, in-person classroom and laboratory teaching. Transfer into second year by existing UBC students as well as students from other universities will be allowed, if the student has taken the same curriculum in science and the Faculty will provide remediation of the restricted first year seminar.

The Program will provide a formalized collaborative framework between the Faculties of Pharmaceutical Sciences and Science. The first year of the program will consist primarily of taught courses that already exist in the Faculty of Science, with an introductory seminar in Pharmaceutical Sciences. The second year taught courses are equally shared between existing Science courses (Term 1) and Pharmaceutical Sciences courses (Term 2). Then the third and fourth year are a dedicated curriculum of courses, laboratories and practical placement in Pharmaceutical Sciences alone. Informal agreements with Medicine (School of Population and Public Health, and Pharmacology) allowing students from that faculty to take our third and fourth year electives as well as our students to take their courses as electives can also promote the ideals of interdisciplinary collaboration in a cost-effective manner.

Students will learn a foundational, natural science curriculum, then specialize into a comprehensive Pharmaceutical Sciences curriculum. They will graduate competent in the knowledge and practical skills of the Pharmaceutical Sciences to enable their problem-solving abilities. These, together with demonstrated teamwork, leadership, entrepreneurial and ethical behaviours, will allow our graduates to contribute to economic, social and political discussions in society.

This program does not lead to employment or registration as a pharmacist and is not a professional program. This program will be the only program of its kind in Western Canada and the only English-speaking program of its kind in all of Canada. There is one other program like this in Canada, at the Université de Montréal, and it is taught in French.

Broadly speaking, at the end of the program students will be able to:

- Apply the knowledge and practical skills gained in this program to contribute to the discovery, development and evaluation of drugs and therapies.
- Be able to contribute to the broad discourse between academic, industry and government professionals through specific training provided by our Faculty that enables these students to understand and be proficient in the types of language required in these sectors.
- Meaningfully contribute to social, political and economic discussions as professionals, entrepreneurs and emerging leaders in the area of pharmaceutical science.

BENEFITS

Learning, Research,
Financial,
Sustainability &
Reputational

The goals of this program are to:

- Address an evolving labour market need identified by research and development in the pharmaceutical and consumer products industries.
- Provide students with the theoretical and practical education needed to enter academia, the pharmaceutical and biotechnology industries, and other related career pathways.
- Be the leading educator of undergraduate students in the Pharmaceutical Sciences, by leveraging our Faculty's reputation for excellence in Pharmacy and the respective foundational sciences.

The BPSc program will provide academic instruction in the Pharmaceutical Sciences that can lead to academic enquiry, but also a clear pathway to employment. The biotechnology and pharmaceutical industry in B.C. is expected to double in size by 2027 and our graduates can support the growth of this industry, bringing economic prosperity to the province. Such an increase over a ten year period also points to the sustainability of the program. Graduates will be prepared for employment in the pharmaceutical and high technology industries.

The program will enhance research at UBC by providing advanced undergraduate instruction in Pharmaceutical Sciences, facilitating entry of these students into the graduate program in Pharmaceutical Sciences with a far greater skill set than currently exists for incoming graduate students. This will increase student success in research and support the wider academic research enterprise of our Faculty and institution.

The program provides a formalized collaborative framework between the Faculties of Pharmaceutical Sciences and Science, which can be leveraged to improve excellence in teaching and research. Informal agreements with Medicine (School of Population and Public Health, and Pharmacology) can also promote these ideals.

RISKS

Financial,
Operational &
Reputational

With input from the Strategic Decision Support team we have prepared a ten year projection for the program which aims to ensure the program can be delivered through a financially viable model. The program is projected to enroll 65 students per year, with a final total at steady state of 260 students.

Any financial investment, specifically new faculty and staff hires, before the program starts and without full certainty of demand is always a financial risk. Revenues are at risk if the projected number of students are not admitted. In our consultations, students have expressed enthusiasm and support for the program and we are confident we will reach projected enrolments.

COSTS Capital & Lifecycle Operating	<p>Capital and lifecycle costs will be covered by the Faculty of Pharmaceutical Sciences from existing operating budget. With support from the Provost and Vice-President Academic (VPA) and UBC Government Relations, a request to partner with the Ministry of Advanced Education, Skills and Training on the delivery of the program will be made.</p> <p>Operating costs will be covered by tuition and a \$1,500 lab fee, which will be assessed during years 2-4 of the program.</p>
FINANCIAL Funding Sources, Impact on Liquidity	<p>Proposed tuition is aligned with standard Bachelor of Science per credit tuition fees. For 2019/20, the approved standard per credit rates are \$179.97 for domestic and \$1,306.58 for international students. The University is prepared to invest in the renovation of laboratories, classrooms and equipment. Presently, the Faculty is operating on a small carry-forward operating surplus so this implementation of this program will not affect liquidity.</p>
SCHEDULE Implementation Timeline	<p>The program will be submitted to the Ministry of Advanced Education, Skills and Training pending approval from the Board.</p> <p>Pending approvals, the program aims to enroll the first cohort of students in September 2020.</p>
CONSULTATION Relevant Units, Internal & External Constituencies	<p>We consulted with the Alma Mater Society (AMS), the Undergraduate Pharmacy Society (PhUS), undergraduate science students at a 'Life Sciences Careers Evening' and our current Pharmacy students and graduate students in Pharmaceutical Sciences, the latter through townhall consultations. We also engaged with alumni from our Pharmacy and graduate science programs by e-mail and in person, including several teleconference calls and informal meetings at Pharmaceutical Sciences Faculty events. Alumni expressed support and enthusiasm for the program.</p> <p>In addition, the following UBC units reviewed, discussed and provided support for the proposal:</p> <ul style="list-style-type: none"> • Faculty of Arts (Associate Dean Academic) • Faculty of Science (Associate Dean Students and Associate Dean Academic, Chair of Undergraduate Programs, Biochemistry, Biology, Chemistry, Mathematics, and Microbiology) • Faculty of Medicine (Associate Dean Academic, Department Chair of Anesthetics and Pharmacology, Director School of Population and Public Health) • UBC Library <p>Finally, we have engaged broadly in B.C. and across Canada with pharmaceutical, biotechnology and other high technology businesses. They too were supportive and enthusiastic.</p>

Tuition and Fee Assessment Details
Bachelor of Pharmaceutical Sciences

The BPSc will be assessed at the standard undergraduate per credit amount for domestic and international students. For 2019/20, the approved standard per credit rates are \$179.97 for domestic and \$1,306.58 for international students. Rates for this program will be aligned with standard undergraduate per credit amounts, which are subject to general tuition increases as approved by the Board of Governors. The proposed lab fee will be \$1,500 per year level during Years 2-4 of the program.

	Domestic	International
Tuition fees per credit – Note 1	\$179.97	\$1,306.58
Application Fees (Undergraduate) – Note 2	\$70.50	\$118.50
Supplemental Application Fees – Note 3	\$87.00	\$87.00
Non-Refundable Acceptance Deposit – Note 4	\$500.00	\$1,000.00
Other Faculty and Course Fees – Note 5	\$1,500	\$1,500

Note 1 – Proposed tuition will be subject to annual increases as established by the university.

Note 2 – This is the current fee for the 2020W application cycle and is subject to annual increases.

Note 3 – This proposed fee is aligned with the current fee for Sauder’s Bachelor of Commerce 2020W application cycle and is subject to annual increases.

Note 4 – The non-refundable acceptance deposit will be applied towards the first tuition instalment.

Note 5 – The proposed lab fee will be \$1,500 per year level during Years 2-4 of the program, and are subject to annual increases.

BACHELOR OF PHARMACEUTICAL SCIENCE STUDENT TUITION CONSULTATION REPORT

The Vice-President, Students Office, in partnership with the Faculty of Pharmaceutical Science, conducted a student consultation regarding the tuition proposal for the Bachelor of Pharmaceutical Science (BPSC). This report outlines the consultation process and summarizes student feedback including the student representatives' submission verbatim in Appendix 2.

Student Representative Bodies Invited to the Consultation

- Alma Mater Society (AMS)
- UBC Pharmaceutical Undergraduate Society

Mode of Consultation

The consultation consisted of an e-consultation and a face-to-face meeting. Student representative groups were invited to the consultation through email, and asked to distribute the invitation to their constituents as they felt appropriate. Student representative groups were also offered a face-to-face meeting to discuss the tuition proposal. A meeting was not requested by student representatives.

Basis of Consultation: The consultation was based on a tuition proposal and rationale document created by the Faculty of Pharmaceutical Science. Please see Appendix 1 for the invitation and tuition rationale document.

Timelines: The e-consultation was conducted over the period of February 5th 2019 to March 6th 2019.

Summary of Student Feedback: A communication was received from the Pharmaceutical Undergraduate Society. The verbatim submission is in Appendix 2.

Organization	Summary
UBC PhUS	SUPPORT RECEIVED "Our society was consulted regarding the new proposed BPSC program and our society is ok with the proposal."

No individual student submissions were received.

APPENDIX 1: INVITATION TO CONSULTATION AND TUITION RATIONALE DOCUMENT

Good morning,

There is a submission by the Faculty of Pharmaceutical Sciences to create a new Bachelor of Pharmaceutical Sciences (BPSc).

In order to inform the program leads and the Board of Governors with regards to the **tuition proposal** for this program, the University is undertaking a consultative process to get your comments as student representatives, and provide an opportunity for students to provide individual comments on the tuition proposal if they wish. **Please note: the scope of this consultation process is limited to the tuition proposal.**

The consultation builds on initial consultation that was done by the program leads, and will consist of:

1. e-consultation

Please find attached a document which outline the details of the tuition proposal, including:

- an overview of the program,
- the student consultation that has happened to date,
- the tuition rationale for the program, and
- the proposed tuition.

Please share the document and this email as you see appropriate. **Comments on the tuition proposal and student organization submissions can be provided confidentially to: Ben Pollard – Director, Strategic Initiatives, Vice President Students Office.**

2. Face to Face meeting

If requested by student representatives, we can arrange a face-to-face meeting with the program leads regarding this tuition proposal. Please advise as soon as possible if you would like us to arrange a meeting.

THE CONSULTATION PROCESS WILL END MARCH 6TH.

Confidentiality

Comments will be collected by the Vice-President Students Office, and only analysts within that office will know the identity of individual students submitting comments. At no time will anyone outside of the Vice President Students Office know the identity of individual students who submit comments to this consultation. Your comments will only be used for the purposes of the tuition consultation.

Comments from individual students will be stripped of any identifying information to ensure confidentiality, but otherwise will be provided to the responsible program leads and Board of Governors verbatim.

Comments received from student organizations will be reported as coming from those organizations, and provided to the responsible faculty and Board of Governors as received. There will also be a summary report of the consultation developed for the Faculty and Board of Governors.

If you have any questions about this process, please contact Ben Pollard in the Vice President Students Office at Ben.Pollard@ubc.ca (Director, Vice President Students Office)

Please let me know if you have any questions about the process.

Thank you

Ben

NEW PROGRAM TUITION CONSULTATION

PROGRAM OVERVIEW

The Faculty of Pharmaceutical Sciences is proposing the development of a new Bachelor of Pharmaceutical Sciences (BPSc). The BPSc will be an undergraduate program with direct entry from high school. Program graduates will take up technical positions in the discovery, development, and production areas of the pharmaceutical industry, or further their education through Graduate studies.

The BPSc will be a 4-year 120 credit program offered in-person at Vancouver's Point Grey campus. Students may choose General Studies (a taught degree), Research Focus (Research Project or Practicum Experience in Year 4) or Honours with Research focus (Research Project or Practicum Year 4 + additional 12 credits taught courses, totalling 132 credits). The program will be delivered through traditional, in-person classroom and laboratory teaching. Transfer into second year by existing UBC students as well as students from other Universities will be allowed, if the student has taken the same curriculum in science and the Faculty will provide remediation of the restricted first year Seminar.

This program leverages existing excellence within UBC Pharmaceutical Sciences. The Faculty of Pharmaceutical Sciences is a quarter-million square foot state-of-the art facility in the heart of UBC's Vancouver campus. The Faculty possess all the teaching classroom and laboratory space necessary to support this program within the Faculty's building and the adjacent Faculty of Science. Within the program 21 tenure-stream faculty members have been identified who have developed syllabi and/or will contribute to instruction in this program, and another 4 faculty members will also be employed throughout the set-up of this program. These faculty are diverse in their career stages, sex and ethnicity providing strong role models for equity and diversity as well as excellence in STEM and allied health science education. The Program also provides a formalized collaborative framework between the Faculties of Pharmaceutical Sciences and Science, and informal agreements with Medicine (School of Population and Public Health, and Pharmacology) that can be leveraged further to improve excellence in teaching and research.

Students will graduate competent in the knowledge and practical skills of the Pharmaceutical Sciences together with being able to demonstrate teamwork, leadership, entrepreneurial and ethical behaviours; this will allow graduates to contribute to economic, social and political aspects of society as a whole. Unique aspects of the program include the option of a one-term Practicum placement in year 4, which will be 100% on-site with an industry partner. Placements will be in the pharmaceutical, nutraceutical, dietary supplement, personal care products (makeup, shampoo *etc.*), technology and biotechnology industries. Another notable aspect to this program is the highly technical laboratories where instruction will be given in making nanoparticles and formulating gels, creams and mixtures. Students will also learn to use cutting edge technologies such as Liquid Chromatography/Mass Spectrometry (LC/MS), Nuclear Magnetic Resonance (NMR), Radiolabeled Tracers for Imaging and nano-particle (Zeta) sizers.

There is only one other program like this in all of Canada, at the Université de Montréal, and it is taught in French. Current evidence of student demand comes from the Université de Montréal that consistently has 5-6 applicants per seat. They report that many Canadian students wish to take their course, but do not because it is in French. The Faculty's own graduate students indicated that many of them would have opted into a program like this as a pathway to careers in industry and to Graduate School.

Employment prospects include biotechnology and pharmaceutical industries, government affairs, relations and policy, regulatory affairs, industrial manufacturing, the personal care product and nutraceutical industries, health care and allied health care professions and transition to academic research. There is a large amount of enthusiasm and buy-in from the technology, biotechnology and pharmaceutical industry in BC and beyond as demonstrated by their positive responses to the Faculty's survey, active assistance in designing aspects of our curriculum, and commitment to take students for practical experiences in the coming years.

STUDENT CONSULTATION DURING THE PROGRAM DEVELOPMENT PROCESS

The Taskforce designing the new program has two Pharmaceutical Sciences Graduate Students members, both of whom also sat on the Curriculum Development Working Group. They have taken active roles in course and syllabus development including laboratory-based classes.

Through a townhall, the Faculty consulted with undergraduate Pharmacy students, who were positive about having another program in the Faculty, with some students indicating they may have preferred Pharmaceutical Sciences to Pharmacy.

At a LSI Careers evening, the Faculty consulted with undergraduate students in the Faculty of Science and received positive feedback regarding transfer into the program; several students noted that they would have been interested in applying from high school.

Of the Faculty's own Graduate students in the Faculty of Pharmaceutical Sciences, the vast majority, at a Town Hall, indicated that they would have been interested in taking a program that looks like this as a path to Graduate School and/or industry. The Faculty's graduate students also indicated they would feel comfortable as Teaching Assistants in this program, and they would have specialized knowledge to offer to undergraduate students.

TUITION AND FEES RATIONALE

The BPSc program will have a small class size of not more than 65 students. This will enable more personal student-professor interactions and instruction, including enabling labour-intensive instructional methods such as debates. The program contains highly specialized components including an optional practicum placement with an industrial partner in 4th year. This placement may lead to direct employment with the provider and will certainly give the students marketable work experience. It is proposed to offer the BPSc at the current undergraduate per credit amount for domestic and international students. For 2019/20, the approved standard per credit rates are \$179.97 for domestic and \$1,306.58 for international students.

The laboratories for this program are high-tech and will include the use of instrumentation such as LC/MS and NMR. Those two instruments alone have acquisition costs of \$650,000 and \$500,000 respectively and annual maintenance costs of \$10,000 – 20,000. All of the instruments are maintained and run by a specialized technician and students will have access to cutting edge technology that is currently used in industrial settings, with guidance from professors and technical staff.

The proposed lab fee is \$1,500 per year level starting year 2-4 of the program. This fee will contribute to the costs for equipment, maintenance, lab technician support and lab consumables. The fee is needed because the Faculty has committed, as noted above, a large amount of monies for cutting edge instruments that will require ongoing maintenance every year and also eventually, renewal. The type of instruments including NMR and LC/MS are the same as those used in professional scientific or industrial laboratories and far above the level of sophistication usually provided for undergraduate laboratories. This equipment will require dedicated lab technician support. These suitably technical learning environments come with significantly greater costs than standard laboratories.

Students in the Honours track will have a Student Advisor with whom they will meet regularly for academic support and planning in Year 3 and Year 4. An annual careers event will be held, with guests from the many sectors in which these students may work. Personalized career support and planning meetings will also be provided for all students in 4th year that wish to take advantage of this service.

Partners from Université de Montréal as well as industry across Canada and the US will help to deliver the program content. We are also working towards a Memorandum of Understanding with the University of Copenhagen, Faculty of Pharmaceutical Sciences. Although much of this will be distance learning, in-person teaching visits will also be organized to bring in top experts in the pharmaceutical sciences from Academia and Industries so that students receive cutting-edge instruction and are exposed to appropriate networking.

The Faculty has chosen to pursue the implementation of a student fee versus differentiated student tuition structure because the Faculty wanted to be very clear and transparent that this is not an opportunity to raise revenue through tuition. Rather, this fee is directly linked to the uniqueness and advanced nature of the program, whereby students will have access to cutting edge technology, equipment and instruments maintained by a specialized technician. Extra attention will be provided to the program to ensure the success and development (technical and otherwise) of our students.

The Faculty is seeking to include a supplemental application fee aligned with Sauder's Bachelor of Commerce supplemental application fee amount, as a similar competitive interview process will apply beyond that of a standard undergraduate program due to the small cohort size of the class.

With respect to financial aid, and access to UBC (also known as Policy 72), in addition to general UBC Financial Aid, scholarships and bursaries the Faculty's Office of Development and Alumni Engagement has an active campaign to attract new bursaries and scholarships for this program. The Faculty's Office of Development and Alumni Engagement are also designing a targeted giving campaign to assist with practicum placement costs. As this program is brand new, these bursaries and scholarships are not yet in place, but pursuing these has been a priority since the design of the program began, nearly two years ago.

For Cost Comparison:

UBC Proposed Tuition

30 credit domestic = \$5,399.10 CAD + \$1,500 lab fee (Years 2- 4)

30 credit international = \$39,197.40 CAD \$1,500 lab fee (Years 2- 4)

The only other program like this in Canada is in Quebec (Université de Montréal). Tuition there is set at: \$2,454 per year for Quebecois, \$7,630 for non-Quebecois Canadians and \$18,780 for international students. All students also pay \$1,200 in fees.

<https://registraire.umontreal.ca/droits-de-scolarite/couts-des-etudes/#c14807>

The University of California at Irvine has a similar program and charges \$US 8,000 per year flat program fee, plus \$US 11,502/year for domestic students and \$US 39,516 for non-Resident and International students. All students also pay a \$US 2,236 University Fee.

<https://www.collegesimply.com/colleges/california/university-of-california-irvine/price/>

<http://pharmsci.uci.edu/post-bac/>

In Melbourne (Australia), Monash University has a similar program where domestic tuition is \$AUD 8,765 and International students pay \$AUD 39,200 per year.

<https://www.monash.edu/study/courses/find-a-course/2019/pharmaceutical-science-p2001?international=true#recent-secondary-education>

The University of Michigan (Illinois) also has a similar program where domestic tuition is \$US 14,964 and non-Resident and International tuition is: \$US 49,022.

<https://admissions.umich.edu/costs-aid/costs>

PROPOSED TUITION AND FEES

The BPSc will be assessed at the standard undergraduate per credit amount for domestic and international students. For 2019/20, the approved standard per credit rates are \$179.97 for domestic and \$1,306.58 for international students. Rates for this program will be aligned with standard undergraduate per credit amounts, which are subject to general tuition increases as approved by the Board of Governors. The proposed lab fee will be \$1,500 per year level during Years 2- 4 of the program.

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APPENDIX 2: STUDENT SUBMISSIONS

There was a communication from the Pharmaceutical Undergraduate Society.

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Dear Natasha,

My name is Jenah Alibhai and I am the Vice President Academic for the Pharmacy Undergraduate Society. Our society was consulted regarding the new proposed BPSC program and our society is ok with the proposal. Please feel free to contact me if you have any additional questions.

Kind regards,
Jenah Alibhai