THE UNIVERSITY OF BRITISH COLUMBIA

REPORT TO THE BOARD OF GOVERNORS

SUBJECT	**MASTER OF DATA SCIENCE AT UBC OKANAGAN**
MEETING DATE	**FEBRUARY 15, 2018**

Forwarded to the Board of Governors on the Recommendation of the President

APPROVED FOR SUBMISSION

Santa J. Ono, President and Vice-Chancellor

DECISION REQUESTED	**IT IS HEREBY REQUESTED that *the UBC Board of Governors approve the new Master of Data Science program at UBC Okanagan, effective for the 2018-2019 academic year.***
Report Date	January 19, 2018
Presented By	Deborah Buszard, Deputy Vice-Chancellor and Principal Cynthia Mathieson, Provost and Vice-Principal Academic Hugh Brock, Associate Provost, Academic Patricia Lasserre, Associate Provost, Enrolment & Academic Programs

EXECUTIVE SUMMARY

The Irving K. Barber School of Arts and Sciences is proposing a new Master of Data Science (MDS) for the Okanagan campus. Like its counterpart in Vancouver, the MDS program is a professional program that targets students who majored in a scientific discipline (*e.g.,* Biology, Economics, Management, Psychology) and wish to gain a competitive advantage in the job market, or become more productive when handling data information.

This program is the same as the MDS offered in UBC's Vancouver campus, with the content slightly modified to reflect the expertise of faculty members at UBCO, while meeting the same learning objectives. Plans are far advanced for cross-campus collaboration for marketing, governance, and quality assurance of the MDS as a single UBC program.

INSTITUTIONAL STRATEGIC PRIORITIES SUPPORTED

✔ **Learning** ☐ **Research** ☐ **Innovation** ☐ **Engagement (Internal / External)** ☐ **International**

or ☐ **Operational**

DESCRIPTION & RATIONALE

Data Science and Data Analytics graduate programs have increased in demand all over the world, due to society's growing reliance on quantitative information. Such programs offer training in fundamental skills in Computer Science, Mathematics, and Statistics. Researchers create new ever-more efficient algorithms to extract meaningful information from data. These algorithms are implemented in numerical libraries in various programming languages, before they are carefully selected to extract information from our vast collection of data. The proposed MDS program focuses primarily on the appropriate selection and usage of existing algorithms, with a secondary goal of implementing newly created algorithms. The

proposed Master of Data Science (MDS) program will provide data science skills to students who have completed a bachelor's degree in a discipline other than Data Science or Computer Science; it will increase their marketability by training them in data science concepts, tools, and techniques. Those students will be ready to meet the increasing demand in data-intensive jobs across industries.

The MDS is a professional program. It targets students with a strong background in quantitative sciences who wish to deepen their skills in Data Analytics and Data Science to pursue a career in industry. Typical target students would have completed a BSc in Biology, Psychology; Bachelor of Management or Commerce; and students with a Bachelor in Applied Science /Engineering.

Like its Vancouver counterpart, the MDS is a 10-month, full-time, accelerated data science master's program concluding with a capstone project. This project provides students with an outstanding opportunity to gain project experience and apply their learned skills on real data.

During the 2016 fall term, a total of 1,700 students answered the *Planning New Program at UBCO Campus* survey. Reponses from this survey demonstrated students' high interest in a professional/applied master's program (79%) and their consideration to stay at UBCO to complete their post-graduate degree (41%). Additionally, 27% of the participants indicated an interested in a program like the MDS but would need additional information.

Overall, 68% perceived data science jobs as very high or highly in demand.

BENEFITS
Learning, Research, Financial, Sustainability & Reputational

The program will contribute significantly to the academic mission of the campus, its role as an engine of regional socio-economic development, and its aspiration to be recognized as a global center of excellence. The MDS will also increase the economic impact of our alumni. Past international alumni in the Interdisciplinary Graduate Studies MSc program remained in North America. These students found employment immediately after graduation in companies such as Microsoft Corp., Amazon.com Inc., and Autodesk Inc. In addition, our Bachelor students (BA/BSc) with a major in Computer Science have also provided numerous success stories by obtaining positions at large companies such as Amazon, Google, and Microsoft. The MDS will build on these success stories by targeting students who wish to work in industry. The MDS is expected to be very attractive to domestic students as well as international students interested in a degree in Data Science.

RISKS
Financial, Operational & Reputational

The program is expected to break even after two years with the assumption of an intake of 35 students, with 20% being international students. Those numbers are conservative estimates based on Vancouver's enrolment data (the MDS program in Vancouver attracted 500 applications this year). While we are confident that the program is sustainable, contingency plans are in place in regards to hiring plans (staggering of hiring, term contracts,…) to get the program underway with minimum risk. Plans with the Faculty of Science in Vancouver are also far advanced to coordinate the program between the two campuses and maximize recruitment and reputational impact.

COSTS Capital & Lifecycle Operating	The program is designed to be cost recovery.
FINANCIAL Funding Sources, Impact on Liquidity	Like many similar professional programs, the tuition for the MDS program is considerably more than a traditional two-year master's degree. Proposed program tuition is identical to its Vancouver counterpart, which is, for the 2018-19 academic year, $31,212 for domestic students and $42,436 for international students. On acceptance to the program, all students will be required to pay a $1,000 CAD non-refundable deposit that will be applied to the tuition. Tuition and fee details are included in Appendix 1.
SCHEDULE Implementation Timeline	The program is scheduled to launch in September 2018.
CONSULTATION Relevant Units, Internal & External Constituencies	The following UBC units were consulted: Faculty of Science (Vancouver), Faculty of Management (Okanagan), Faculty of Education (Okanagan), School of Engineering (Okanagan), Faculty of Creative and Critical Studies (Okanagan), College of Graduate Studies (Okanagan) and the Faculty of Health and Exercise Science (Okanagan). The local community was consulted including Okanagan College, local municipalities along the Valley, and organization such as Accelerate Okanagan as well as businesses, some of which are intensive users of data (such as the forest industry). Consultation with the UBC Students' Union Okanagan took place from October 30th , 2017 till November 10th, 2017 and consisted of an e-consultation as well as an in-person meeting on November 16th, 2017. From the students' perspective, the creation of the MDS on the Okanagan campus is an innovative and unique addition to the campus.

Appendix 1 – Program Tuition and Fee Assessment Details

Program Description: Master of Data Science

Start Date of the Program: 2018 Winter Session

	Domestic	International
Tuition Fees – Note 1	$31,212	$42,436
Application Fee – Note 2	$102	$165
Supplemental Application Fees	Not applicable	Not applicable
Non-Refundable Acceptance Deposit – Note 3	$1,000.00	$1,000.00
Other Faculty and Course Fees	Not applicable	Not applicable

Note 1 - Tuition and student fees are charged in three equal instalments payable in January, May and September.

Note 2 - This is the current standard rate for the 2017W application cycle and is subject to annual increases.

Note 3 - The non-refundable acceptance deposits will be applied towards the first tuition instalment.

Dear Trophy,

The Irving K. Barber School of Arts and Sciences will be offering a Masters of Data Science (MDS) program starting in 2018. Although we are adopting the same tuition as the MDS offered at UBC Vancouver, a consultation with various stakeholders on our campus must be conducted. After consultation with the UBCSUO, it will be determined if a broader consultation is required. Please note that the scope of this consultation process is limited to the tuition proposal.

The attached document outlines the consultation process. It includes:

- instructions to provide your feedback
- an overview of the program
- the proposed tuition
- similar program tuition in other universities

Students and student organisations can either submit their comments via e-mail or during a face-to-face meeting to be held on campus on a date to be determined in consultation with the UBCSUO.

The consultation process will end November 10, 2017.

Don’t hesitate to contact me if you have any questions.

Thank you.

Ian Cull
Associate Vice President Students

Masters of Data Science Tuition Consultation

The University would like to gather your comments on the tuition proposal for the new Masters of Data Science (MDS) program. Below you will find:

- instructions to provide feedback
- an overview of the program
- the proposed tuition
- similar program tuition in other Canadian universities

Instructions

We are seeking comments from individual students and student organisation on campus. Please review and distribute the information below as you deem appropriate.

All comments should be sent to: ian.cull@ubc.ca by November 10th, 2017.

If you have any questions about this consultation process, please contact the AVP Students Office: ian.cull@ubc.ca.

Confidentiality

Comments will be collected by the Office of the Associate Vice-President (Students), and only analysts within that office will know the identity of individual students submitting comments. At no time will anyone outside of the Office of the Associate Vice-President (Students) 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 Faculties and the 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 of Critical and Creative Studies, the Irving K Barber School of Arts and Sciences, and Board of Governors.

Program Overview

The Master of Data Science program is a 10-month, 30-credit non-thesis accelerated professional degree program that offers a sound foundation in data science techniques. The program focuses on modeling, data extraction, data cleaning, data analysis, and communicating results to support evidence-based decisions. The capstone project provides an outstanding opportunity for students to get project experience and apply their skills on real data.

The MDS targets students with a strong background in quantitative sciences who wish to deepen their skills in Data Analytics and Data Science to pursue a career in industry. Students entering the program typically have a bachelor's degree in any discipline that relies increasingly on data such as Biology, Chemistry, Economics, Engineering, Geography, Management, or Psychology, but also Digital Media, Earth and Environmental Sciences, Education, Health Care, History, Physics, Sociology, etc.

This program is not intended for students with an undergraduate degree in Computer Science or Statistics. It is restricted to students who have not declared a Major or Minor in Data Science and have not taken a significant number of data science courses.

For more information about the MDS program, please contact bernard.momer@ubc.ca.

Tuition

Like many similar professional programs, the tuition for the MDS program is considerably more than a traditional two-year master's degree. The UBC MDS program is unique in Canada. Simon Fraser University offers a similar program over a four semester period with a $27,591 program tuition for domestic students and $32,897 for international students. UBC Okanagan will charge the same tuition as for the MDS program at the Vancouver campus which is, for the 2018/19 academic year, $31,212 for domestic students and $42,436 for international students. On acceptance to the program, all students will be required to pay a $1,000 CAD non-refundable deposit that will be applied to the tuition.

Professional master degrees focus on career development in certain professions and have a hands-on heavy practical component to give students the knowledge and skills to work professionally in their chosen field (the most famous one being the MBA). Because these programs are job market driven, their tuition is appropriately priced so students increase their chances of securing a job in their domain and obtain a good return on investment, while universities deliver these programs in a cost recovery basis (vs. a subsidized basis for research-based programs). This program includes an industry-sponsored capstone team project, an emphasis on using existing methods instead of theoretical justifications, and the use of real-world data sets in all courses.

Rationale

The higher tuition for the MDS program reflects the cost recovery nature of professional graduate degrees, the higher costs of delivery and the enhanced program amenities. The MDS provides value added to the students by:

a) Providing access to restricted educational resources (i.e. courses and specialised datasets).

b) Providing access to industry and community partnerships providing students professional experiences beyond the classroom.

c) Offering a high quality accelerated program over an intensive 10-month period using flexible learning techniques.

Tuition for Similar Degrees at Other Institutions

School	Similar Programs	Program Tuition (Domestic)
University of Maryland	MSc Data Analytics	$27,000*
SFU	Masters in Big Data	$27,591
University of Minnesota	MSc Data Science	$30,000*
UBCV	Masters of Data Science	$31,212
Georgia Tech	MSc Analytics	$43,000*
Texas A&M	MSc Analytics	$50,000*

*US Dollars

Masters of Data Science Tuition Consultation

STUDENT TUITION CONSULTATION REPORT

The Associate Vice-President, Students Office, in partnership with the Irving K. Barber School of Arts and Sciences conducted a student consultation regarding the tuition proposal for the new Masters of Data Science program.

Student Representative Bodies Invited to the Consultation
University of British Columbia Students' Union Okanagan

Mode of Consultation
The consultation consisted of a face-to-face meeting with the Students' Union Executive. The Students Union was invited to the consultation through email, and asked to distribute the invitation to their constituents as they felt appropriate. We met with the Students Union on November 16, 2017. At this meeting all of the required Program information was shared.

Basis of Consultation: The consultation was based on a tuition proposal and rationale document created by the Faculty.

Summary of Student Feedback: Submissions were requested from the University of British Columbia Students' Union Okanagan (UBCSUO). They were requested to have this to Ian Cull, AVPS on or before November 10, 2017.

We met with Dr. Bernard Momer and the UBCSUO Executive President on November 16/17 to carry out the consultation on the Masters of Data Science Tuition Fee schedule.

The President asked the following questions; 1) he was curious about the tuition fee cost. Dr. Momer indicated that these courses cost more to develop and as a professional program they are designed to be full cost recovery, so tuition fees are higher.

2) How do our fees compare to the fees on the Vancouver campus? The international tuition fees will be at the same as the program on Vancouver Campus as the programs are essentially the same.

3) What might the demand be for this program? The program was run on the Vancouver Campus during the past academic year and they took in about 20 students. The application pool for year was very large, the demand was high. The program is focussed on working professionals rather than direct entry for new graduates and is an Applied Program.

The UBCSUO President indicated that he would write a letter providing feedback.

He was asked to provide written feedback to Ian Cull, Associate Vice President Students, as soon as possible.

To date the UBCSUO have not written to express their views in the proposal above, however the required consultation has taken place. We still hope to hear from them.